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An investigation into burnout in family physicians in low- and middle-income countries: a mixed methods study

Tanya Ruth Wright

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Abstract

Background

Burnout is a work-related stress phenomenon, characterised by exhaustion and disengagement from work, and with significant consequences. Highly prevalent among healthcare professionals, burnout is becoming an issue of global concern. Therefore, the aim of this study was to investigate the prevalence, associated factors, and experience of burnout in family physicians in low- and middle-income countries.

Method

This mixed-methods study collected data from family physicians in Pakistan, South Africa, Malaysia, Sri Lanka, and Zambia, using an online questionnaire containing the Oldenburg Burnout Inventory, followed by online semi-structured interviews with family physicians. Prevalence percentages were calculated, tests of association performed, and a hierarchical Poisson regression analysis conducted. Statistical significance was set at $p \leq .05$. Interviews were analysed using a thematic approach.

Results

The overall sample size was 451. Burnout prevalence was 77.4% (95%CI 73.4-81.1). Significant risk factors for burnout were working over 50 hours per week (IRR, 1.06; 95%CI 1.01 – 1.11; $p = .03$) and conflict at work (IRR, 1.12; 95%CI 1.00 – 1.27; $p = .05$). Significant protective factors were manager support (IRR, 0.82; 95%CI 0.74 – 0.91; $p = <.001$), and a lack of conflict between work and home responsibilities (IRR, 0.82; 95%CI 0.74 – 0.92; $p = .001$). Interviews were conducted with 33 family physician participants. Thematic analysis identified

four themes: demands; resources; living with work-related stress and burnout; and coping strategies and solutions.

Conclusions

Burnout is common among family physicians. Significant risk factors include working hours and work-related conflict while work-home balance and support act as protective factors.

Burnout impacts on physician health, performance, and turnover intention.

Implications

This high prevalence of burnout has significant implications for physician health, performance, and staffing in these countries. Understanding the experience of physician burnout, together with risk and protective factors, is vital for developing interventions to prevent burnout or mitigate its impact.

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List of Abbreviations

ACT	Acceptance and Commitment Therapy
APA	American Psychological Association
BAT	The Burnout Assessment Tool
BM	The Burnout Measure
CBI	Copenhagen Burnout Inventory
CBT	Cognitive Behavioural Therapy
CESQT	The Spanish Burnout Inventory
CFS	Chronic Fatigue Syndrome
CFQ	Compassion Fatigue Questionnaire
CHWs	Community Health Workers
CI	Confidence Interval
COR	Conservation of Resources
CVD	Cardiovascular disease
D	Disengagement subscale OLBI
DALYs	Disability Adjusted Life Years per 100,000 population
DP	Depersonalisation subscale (MBI)
DPIA	Data Protection Impact Assessment
E	Exhaustion subscale OLBI
EE	Emotional Exhaustion subscale (MBI)
EFCS	Emotion-Focused Coping Strategy
ES	Education Survey
EU	European Union
FM	Family Medicine
FMHS	Faculty of Medicine and Health Sciences
FMS	Family Medicine Specialist
FP	Family Physician
GDPR	General Data Protection Regulation
GNI	Gross National Income

GP	General Practitioner
GS	General Survey
HBP	Hypertension
HIC	High-Income Country
HPA axis	Hypothalamic-pituitary-adrenal axis
HSS	Human Services Survey
ICD-11	The International Classification of Disease 11 th revision
IRB	Institutional Review Board
IT	Information Technology
JD-R	Job Demands-Resources
KHS	Keele Health Survey
KMU	Khyber Medical University
KU	Keele University
LMIC	Low- and middle-income country
MakUni	Makerere University
MBI	Maslach Burnout Inventory
MBSR	Mindfulness Based Stress Reduction
MeSH	Medical Subject Headings
MS	Microsoft
NCDs	Non-communicable diseases
NGO	Non-Government Organisation
NHRA	National Health Research Authority
NHS	National Health Service
OLBI	Oldenburg Burnout Inventory
PA	Personal Accomplishment subscale (MBI)
PFCS	Problem-Focused Coping Strategy
PsyCap	Psychological Capital
PROMs	Patient Reported Outcome Measures
ProQOL	The Professional Quality of Life Scale
REC	Research Ethics Committee
SD	Standard Deviation
SE	South-East

SLA	Service Level Agreement
SOPs	Standard Operating Procedures
SSA	Sub-Saharan Africa
SU	Stellenbosch University
TM	Tedium Measure
UHC	Universal Health Coverage
UK	United Kingdom
UNCST	Uganda National Council for Science and Technology
UNZA	University of Zambia
UoM	University of Malaya
UoSJ	University of Sri Jayewardenepura
USA	United States of America
WHO	World Health Organisation

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Chapter 1 Introduction

Burnout is a well-researched phenomenon in high-income countries (HICs) with substantial data on the burden of burnout in both primary and secondary care physicians (British Medical Association, 2019; Merritt Hawkins, 2018). However, the burden of burnout in healthcare professionals in low- and middle- income countries (LMICs) is less clear. This is important as the potential consequences of burnout for healthcare professionals, their patients, and for wider society, are significant. This thesis uses a mixed methods approach to investigate the prevalence, associated determinants, and experience of burnout amongst family physicians (FPs) in five different LMICs, seeking to add to the current knowledge of burnout among FPs in LMICs. This introductory chapter will begin with a summary of the history of burnout research across occupations, its theoretical framework, its risk factors and consequences and its prevalence in healthcare professionals. This will be followed by an outline of the importance of primary care in LMICs, evidenced by the World Health Organisation's (WHO) identification of primary care as essential to the delivery of Universal Health Coverage (UHC) (WHO, 2023a), together with the definition of primary care/family physician that will be used in this study, and a discussion of the relevance for LMICs of specific risk factors associated with burnout. The chapter will conclude with the research rationale.

The PhD candidate is a family physician by background although no longer working in a clinical capacity. She has a lifelong interest in global health as she was brought up in Kenya, completed her medical elective in a rural hospital in Thailand, and lived in Sudan for two years as an adult. She is passionate about the health and well-being of the healthcare professionals that deliver health services in lower resource settings as she believes that their

needs are often overlooked when it comes to health research. In a very real sense those who deliver health services are the heart of the health service, and without a healthy workforce we cannot expect delivery of a high-quality health service. This PhD brings together these three areas of particular personal interest.

1.1 Burnout

1.1.1 Background

The term 'burnout' was first introduced to research in the 1970s with the work of Freudenberger, a clinical psychologist (Freudenberger, 1974, 1975) and Maslach, a social psychologist (Maslach, 1976, cited in Schaufeli et al., 1993). Early research focused on workers in human services and healthcare settings where emotional and intense, interpersonal relationships are a fundamental element of the job (Schaufeli et al., 1993). Burnout was postulated to be related to the underlying emotions, values, and motivation of this provider-recipient relationship; and exacerbated by heavy workloads, long work hours, scarce resources, and a lack of positive feedback from clients (Freudenberger, 1974, 1975). Two main themes defining burnout emerged out of this early exploratory work. The first was that emotional exhaustion was a common response to intense occupational demands, the second was that the detachment, developed by healthcare workers as a coping mechanism, could become excessive, leading to a 'callous disregard' of clients, and a negative, and cynical attitude (Maslach, 1978; Maslach et al., 2001; Wills, 1978).

During the 1980s there was a move away from this descriptive qualitative approach to a more systematic and quantitative approach with the use of standardised questionnaires and the sampling of larger populations (Maslach et al., 2001). The focus shifted away from describing burnout to developing methods to measure it. Maslach's early exploratory

research resulted in the derivation of a multi-dimensional definition of burnout comprising the dimensions of emotional exhaustion (EE), depersonalisation (DP), and decreased personal accomplishment (PA) (Maslach, 1982, 1998). Maslach and Jackson subsequently developed a scale to measure these dimensions called the Maslach Burnout Inventory (MBI) (Maslach and Jackson, 1981). This was followed by the development of other measurement tools, such as the Tedium Measure (Pines et al., 1981), later re-named as the Burnout Measure (BM), which focuses on exhaustion as the core component of burnout. Although the MBI is currently the most widely used measurement tool for measuring burnout (Guseva Canu et al., 2021), ongoing debate, surrounding Maslach's multi-dimensional definition and the psychometric qualities of the MBI, has led more recently to the development of new measurement tools in several other countries. These include the Oldenburg Burnout Inventory (OLBI), developed in Germany, which focuses on the two core components of exhaustion and disengagement (Demerouti and Bakker, 2008), and the Copenhagen Burnout Inventory (CBI), developed in Denmark, which focuses on three aspects of exhaustion: emotional; physical; and cognitive (Kristensen et al., 2005). The variety of different measurement tools will be discussed in more detail in Chapter 3.

Progress over subsequent decades saw a continuation of empirical research and the extension of burnout theory to other occupations besides education and human services (Schaufeli and Greenglass, 2001). Researchers began to explore the relationships between organisational factors and burnout in more depth, with several longitudinal studies allowing the study of burnout as a process over time and the impact of interventions (Bakker et al., 2000b; Burke and Greenglass, 1995; Grau-Alberola et al., 2010). More recently, the 11th revision of the International Classification of Disease (ICD-11) includes burnout syndrome, classifying it as an occupational rather than a medical phenomenon (WHO, 2019a). The ICD-11 describes burnout syndrome as the result of chronic, unmanaged, workplace stress,

characterised by a triad of features: the first being emotional exhaustion; the second cynicism and apathy; and the third a feeling of incompetence or lack of professional self-efficacy (WHO, 2019a). Although 'workplace' is usually understood to refer to paid occupations there is evidence to suggest that the phenomenon of burnout is not confined to paid occupations but can also be experienced by those in unpaid 'occupations' such as informal caregivers (Chan et al., 2021), voluntary workers (Schaufeli, 2021), athletes (Bicalho and Costa, 2018), and even parents (Roskam et al., 2017). This suggests that a broader understanding of the terms 'occupation' and 'workplace' may be appropriate in burnout. Indeed, Schaufeli (2021, p.169) suggests that the term 'work' or 'occupation', as it relates to burnout, should be understood as any "... structured, goal-oriented activities that are compulsory in nature and aim to transform the physical or social environment and/or the self...".

Although the use of the term 'burnout' in the academic literature traces back to the 1970s, there are good descriptions of 'burnout' long before it was defined as such. Examples in the academic literature include the case study of Nurse Jones which explores the impact of staff 'low morale' on the functioning of a psychiatric ward (Schwartz and Will, 1953). Although Schwartz and Will (1953) use the phrase 'low morale' to describe the withdrawal of Nurse Jones, their description of its manifestation as exhaustion and indifference parallels descriptions of burnout. In addition, Nurse Jones describes how, as her morale dropped, she came to resent her patients, treating them with the 'callous disregard' described in the early burnout literature. This lends weight to the idea that Nurse Jones is, in fact, describing the process of burnout. Also relevant in the academic literature is the description of 'managerial disease' in Germany in the 1950s. This was described as excessive strain on one's capabilities resulting in exhaustion, insomnia, and the use of stimulants (Kury, 2017). Other exhaustion syndromes, such as the neurasthenia of the 1880s, share many common features with

modern day 'burnout' (Neckel et al., 2017), and indeed work-related neurasthenia may be considered to be the psychiatric equivalent of burnout (Maslach et al., 2001). In fictional literature 'Buddenbrooks', first published in 1901 (Mann and Lowe-Porter, 1957), and 'A burnt-out case', where a successful architect gives up his architectural practice and withdraws to a leper colony in Africa (Greene, 1960), also appear to describe processes of burnout.

Clearly, the experience of occupational stress leading to the burnout phenomenon is not confined to recent decades. It is also, likely, not confined to particular geographical or economic regions. These economic regions are often defined as the Global North, representing the wealthier, more industrialised nations, and the Global South, in contrast, representing the poorer, less industrialised nations (Collins, 2022). Much of the burnout research to date has been done in the Global North with the first decade of research occurring largely in the United States of America (USA), and subsequently in other, largely high-income, countries. Therefore, burnout, as the concept exists today, has been largely defined and researched in specific cultural and economic contexts. Indeed, Rösing (2003, cited in Schaufeli, 2017a) describes the concept of burnout as 'ethnocentric', arguing that the dimensions of DP and PA are both culture specific concepts. This raises questions over the generalisability of this, largely Global North research, for the Global South, questions over the role of culture in an individual's understanding and experience of burnout, whether aetiology, prevalence, risk factors, and protective factors are the same across cultures and economies, and about the cross-cultural validity for the Global South, of measurement tools which have been largely developed in the Global North. These questions are beginning to be answered with a small but increasing number of studies being conducted in the Global South.

1.1.2 A theoretical framework

The theoretical underpinnings of burnout have been much debated and will be discussed in more detail in Chapter 3. However, the most widely accepted theoretical framework is the job demands-resources (JD-R) model (Bakker and Demerouti, 2007), which has much in common with a general stress and motivational theory, the conservation of resources (COR) theory (Hobfoll, 1989). COR theory posits that loss of resources is the principal driver in the development of stress, with resource gain contributing to the mitigation of stress. In this theory resources may be lost, threatened, or there may be insufficient gain of resources following a significant resource investment, and all these scenarios generate stress. As individuals lose resources, further resources may need to be mobilised to mitigate these losses, and this may either lead to recovery from stress or a negative spiral may ensue resulting in chronic stress (Hobfoll, 2001).

The JD-R model applies this general stress theory more specifically to the work domain arguing that when these losses relate to work demands and work resources, the resulting spiral into chronic stress can lead to burnout (Bakker and Demerouti, 2007; Hobfoll, 2001; Schaufeli and Bakker, 2004). This model posits that the demands of a job are those that require sustained effort or skill and exact a physiological or psychological toll, for example heavy workloads, or time pressure. In contrast, a job's resources are those aspects that either decrease the demands and costs of the job or contribute to professional development and the achievement of goals, for example, colleague support, further education, or autonomy. It is the balance of these factors that determines the strain experienced by the worker and the sustained imbalance of demands over resources that may eventually lead to burnout. Two processes are assumed: the first relates to energy whereby substantial job

demands deplete a worker's energy levels over time, exhausting energy reserves; the second relates to motivation whereby a lack of resources to deal effectively with the demands of the job lead to disengagement and withdrawal. This correlates well with the emotional exhaustion and cynicism elements of burnout, identified in the earliest burnout research (Freudenberger, 1974; Maslach, 1978).

The definition of resources is those elements, either physical, psychological, social, or organisational, that have value either intrinsically or as a conduit to achieving other, valued resources (Hobfoll, 1989). 'Value' is a subjective concept and dependent to a degree on a society's value system and as such, there may be cultural variations in what defines a resource, or in which resources are most valued (Hobfoll, 2002, 2001; Hofstede et al., 2010). For example, the importance and availability of a resource such as social support may differ between collectivist and individualist cultures (Pines et al., 2002). This would imply the possibility of differences in the impact of specific risk factors and protective factors for burnout between distinct cultures, underlining the importance of cross-cultural burnout research.

1.1.3 Risk factors for burnout

Within the JD-R model for the aetiology of burnout, job demands predict the risk factors for the development of burnout, while job resources such as autonomy and support, may buffer these demands, providing a degree of protection (Bakker et al., 2004; Xanthopoulou et al., 2007). Freudenberger (1974) identifies the demands of heavy, intense workloads and long hours as risk factors for burnout in his earliest research on burnout, and these risk factors have become well established along with understaffing, and a lack of physical resources, such as the equipment and supplies that are needed for the job (Carod-Artal and Vázquez-

Cabrera, 2013; Maslach et al., 2001; Maslach and Leiter, 2016; Rachiotis et al., 2014; Raviola, 2015; Thomas and Valli, 2006). Qualitative studies in healthcare settings in LMICs also confirm heavy workloads, understaffing, and insufficient resources as major risk factors for burnout (Keshvari et al., 2012; Mohale and Mulaudzi, 2008; Moosa and Gibbs, 2014; Selamu et al., 2017; Wendland, 2010). Additionally, a recent French study found that a density of FPs below 7.75 per 10,000 population independently predicted FP burnout suggesting that the workplace specific risk factor of understaffing may be extended to more general workforce shortages (Picquendar et al., 2019).

Other risk factors, identified by an extensive review of the burnout literature, include conflict at work and between home and work responsibilities, job insecurity, rapid organisational change, lack of control, time pressure, and years of service, along with demographic factors such as single marital status, younger age and caring for children (Carod-Artal and Vázquez-Cabrera, 2013; Maslach et al., 2001; Rabatin et al., 2016). Walden (2016) identifies a less well recognised contributor to burnout in healthcare professionals as the inability to provide quality care for the patient. Although physician stress has a recognised impact on the quality of care provided (Dewa et al., 2017) the converse may also be true with an inability to provide high quality care for patients being a significant cause of stress for physicians (Friedberg et al., 2014; Raviola, 2015; Raviola et al., 2002; Wendland, 2010). This is particularly relevant for LMICs where inadequate supplies of medicines and equipment may significantly curtail a physician's ability to provide the best care for their patient (Raviola, 2015; Wendland, 2010), thus exacerbating the stress of insufficient physical resources with that of being unable to provide quality care for the patient.

According to the JD-R model, workplace resources may offset, or buffer, workplace demands. These resources include social support, both from colleagues and supervisors,

educational and professional development opportunities, and autonomy (Bakker and Demerouti, 2007; Carod-Artal and Vázquez-Cabrera, 2013; Riley et al, 2021a). Job demands are stronger predictors of the exhaustion component of burnout, while the lack of job resources predicts the cynicism component more strongly (Bakker and Demerouti, 2007). Consequently, access to job resources is a greater buffer for the cynicism aspect of burnout than the exhaustion aspect. This interplay between job demands and job resources is significant regarding the development of potential interventions. Where job demands are high and impossible to mitigate, their impact may perhaps be offset by increasing access to job resources such as support and professional development opportunities. While the burnout literature spans a range of occupations, much of the research referenced in this section has been conducted in healthcare settings.

1.1.4 Consequences of burnout

Consequences of burnout within healthcare are significant and will be discussed in more detail in Chapter 3. They include negative consequences for the individual's physical and mental health (Salvagioni et al., 2017), as well as consequences for patient safety and the quality of care provided (Salyers et al., 2016; Tawfik et al., 2019), rates of sick leave and absenteeism (Anagnostopoulos and Niakas, 2010; Toppinen-Tanner et al., 2005), intention to quit and actual turnover (Willard-Grace et al., 2019), and the migration of healthcare professionals in pursuit of better working conditions (Anduaga-Beramendi et al., 2019). Moreover, there are significant economic consequences. The migration of healthcare professionals from lower income countries to higher income countries results in significant economic losses and may be partly due to burnout, although other contributing factors have been identified (Kirigia et al., 2006). Likewise, costs are incurred through lost productivity,

and the impact of burnout on both the health of the professional and the quality of care they can provide (Han et al., 2019).

1.1.5 Burnout in healthcare professionals

Early research identified professions with high levels of interpersonal contact, such as the medical profession, as being high risk for burnout. Healthcare professionals are often required to develop and maintain strong interpersonal work relationships with challenging clients, and this can be both cognitively and emotionally demanding (West, 2015). Moreover, while this emotionally intense work can be rewarding, the demands can equally be a source of stress, leading to exhaustion and a desire to distance oneself or withdraw (Maslach and Leiter, 2016). Indeed, extensive research in HICs, and less extensive research in LMICs, has identified high levels of burnout across all healthcare professions, including nursing staff and all specialities of physicians. A recent meta-analysis of burnout prevalence among health professionals in India included doctors of all specialities, dentists, nurses, and paramedical staff, and found a pooled prevalence of 24% for high levels of EE, 27% for high levels of DP, and 23% for low levels of PA (Kesarwani et al., 2020). Systematic reviews from sub-Saharan Africa (SSA) and the Arab countries have also found high levels of burnout across a similar range of healthcare professions. These ranged from 40-80% among healthcare professionals in SSA (Dubale et al., 2019), and from 20-81% for EE, 9.2-80% for DP, and 13.3-85.8% for reduced PA, in the Arab countries (Elbarazi et al., 2017). Furthermore, Bria et al. (2012) included hospital-based doctors, nurses, and residents in their review of European studies, and found that around a third of all healthcare professionals included in their study were experiencing high levels of burnout. The prevalence of burnout was found to be highest in Southern and Eastern European countries, and lowest in the Scandinavian countries,

probably reflecting differences in the staffing and resourcing of healthcare in these countries (Bria et al., 2012). In Japan, a study found that 36.1% of healthcare professionals had high levels of burnout, compared to 17.8% of civil servants and 12.2% of company employees (Kitaoka and Masuda, 2013).

More specifically, studies among nursing staff have also identified high levels of burnout in this cadre of healthcare professionals, with a global meta-analysis of burnout in nurses finding a pooled prevalence for high burnout of 11.23% (Woo et al., 2020). In addition, the study found a paucity of studies from 'developing' countries, in particular countries in SSA. A recent systematic review of studies on nurses in SSA found just 12 articles from seven African countries (Owuor et al., 2020) and estimated a pooled prevalence for burnout among sub-Saharan nurses of 66% for moderate to high levels of EE, 60% for moderate to high levels of DP, and 49% for moderate to high levels of reduced PA. This suggests that levels of burnout among nurses in SSA may be substantially higher than the overall global estimates. However, the SSA study combined both moderate and high levels of each dimension for their calculation of pooled prevalence, in contrast to the global review which only calculated pooled prevalence for high levels of burnout. This may account for some of the difference. In addition, the SSA pooled prevalence is based on only seven studies with a combined population for meta-analysis of only 1,923. Other studies on nursing professionals, including midwives, confirm high levels of burnout among this group of health professionals (Dyrbye et al., 2019; Sidhu et al., 2020; Zeng et al., 2020).

Burnout is also highly prevalent among the physician cadre of healthcare professionals. A recent editorial in *The Lancet* (2019) describes burnout in physicians as a 'global crisis', pointing out that a recent survey of physicians in the USA reported a burnout prevalence of 78% (Merritt Hawkins, 2018). In addition, the editorial refers to the findings of a British

Medical Association survey that 80% of doctors in the United Kingdom (UK) are either at high, or very high, risk of burnout with junior doctors facing the highest risk, followed by general practitioner partners (British Medical Association, 2019), and concludes that system reform in response to the burnout crisis is an urgent necessity. System reform requires an acknowledgement by organisations and health systems that attempting to address burnout on an individual basis alone is inadequate. Addressing burnout will also require changes to organisational structures and workplace cultures (The Lancet, 2019). The editorial also observes that there is a scarcity of data on physician burnout in LMICs and that, given increasing and substantial health care demands in these countries, it is likely that burnout in LMICs is a swiftly growing but under-recognised epidemic. A global review of the prevalence of physician burnout included 182 studies representing 45 different countries (16 LMICs) and found wide variations in the prevalence of physician burnout, ranging from 0% up to 80.5% for overall burnout (Rotenstein et al., 2018). In the USA, Shanafelt and colleagues (2012) found physicians were more likely to have symptoms of burnout than those in the general working population, with 45.8% experiencing high levels of at least one of either the EE or DP dimension.

Physician burnout varies according to specialty with primary care often featuring among the higher risk specialities (Merritt Hawkins, 2018; Shanafelt et al., 2012, 2015). A study of burnout in primary care physicians in Europe found that up to 43% had a high score in at least one dimension of burnout, while 12% had high scores in all three dimensions (Soler et al., 2008). A more recent study in Israel found that 44.5% of primary care physicians had high levels of EE, 36% had high levels of DP, and 31.6% had low levels of PA (Kushnir et al., 2014). In addition, 56% of these physicians had high levels of EE and/or DP (Kushnir et al., 2014). In contrast, a study in Qatar found a prevalence of 12.6% for burnout in primary care physicians (Abdulla et al., 2011), markedly lower than both the aforementioned Israeli study and a

Danish study among primary care physicians which found a prevalence of 25% (Brøndt et al., 2008). Abdulla et al. (2011) suggest that this may be due to differences in culture, such as patient attitudes, together with differences in health systems, which may impact on factors such as the role of primary care physicians within the system.

A range of factors are associated with high levels of burnout in primary care physicians. Heavy workloads are a well-recognised demand in healthcare but others include time pressure, low control, and chaotic work environments (Rabatin et al., 2016; Rassolian et al., 2017), as well as work content (increased administrative tasks) and quantity; feeling undervalued; responsibility-authority mismatch; difficulty accessing secondary care and diagnostic tests; a lack of boundaries regarding what is the remit of primary care physicians and what is not; a lack of resources; medicolegal issues; diagnostic uncertainty; and unrealistic expectations from both patients and secondary care colleagues (Agarwal et al., 2020; Lee et al., 2008; Zhou et al., 2022). In some health systems there may also be conflict between a physician's clinical values and the values of the health organisation they work for especially regarding funding (Agarwal et al., 2020). Some of these associated factors may be unique to primary care such as the lack of boundaries, and difficulties with access to specialist care and diagnostic tests. Others, such as time pressure, have a unique aspect in primary care, where in some systems physicians are dealing with a new patient and problem every ten minutes (Rochfort et al., 2021). Supervisory support for primary care physicians correlates clearly with reduced risk of burnout (Fuchs et al., 2011). In addition, Brøndt et al. (2008) found that being a member of a continuing medical education or supervision group was a significant protective factor for this group of physicians.

Despite the substantial burden of burnout in physicians and the considerable evidence linking heavy workloads, and scarce resources, including human resources, to the

development of burnout, organisational and regulatory change within healthcare has been slow. In fact, an analysis of workloads for primary care physicians in England by Hobbs et al. (2016) found a 16% increase in workload between 2007 and 2014. Over the same period there was a decrease of 1% in full time equivalent primary care physicians per 100,000 population (Hobbs et al., 2016). This tolerance of high, and increasing, levels of workload, stress, and fatigue is in marked contrast to other safety critical industries such as the airline industry where strict regulations to protect workers from fatigue and overwork have been in place for some years (Caldwell et al., 2019; Greig and Snow, 2017). There is however, a cultural norm within medicine of long hours and high workloads and this, together with the moral imperative to continue meeting the needs of patients even when resources are scarce, contributes to an acceptance of these working conditions despite their impact on well-being (Greig and Snow, 2017).

In summary, burnout is common among healthcare professionals in general. Among physicians, primary care is one of the higher risk specialities with several factors, some unique to primary care, associated with this increased risk. There are, however, considerable differences in the prevalence of burnout between countries and the reasons for this may include cultural differences as well as health system differences. These differences underline the importance of investigating the burnout phenomenon in countries where there is a dearth of data on both the prevalence and the impact of burnout in primary care physicians.

1.2 The healthcare workforce

1.2.1 Primary healthcare and defining family medicine

The WHO have identified primary healthcare as the cornerstone of cost-effectively achieving UHC (WHO, 2023a) and have stated that “health services are only as effective as the persons

responsible for delivering them” (Campbell et al., 2013, p.vi). Sufficient numbers of healthcare workers are just one factor in achieving this. Healthcare workers must be accessible especially in rural areas, they must be competent, well trained and supported, and capable of delivering high quality care (WHO, 2016). In addition, the WHO (2016) have set out several objectives in their 2016 workforce strategy. These include optimising job satisfaction, motivation and performance of health workers as well as ensuring retention and equitable distribution. The WHO pledge to prioritise the development of primary care teams and acknowledge the importance of the provision of clear roles, and guidelines for health workers as well as appropriate support and professional development opportunities (WHO, 2016). Primary care physicians play a pivotal leadership role in the delivery of primary care and if these objectives are to be achieved then it becomes particularly important to understand the impact of burnout syndrome on primary care physicians in LMICs, given the potential consequences of burnout.

There is a tendency among global primary care researchers to use the terms ‘primary care’ and ‘family medicine’ interchangeably, therefore the term ‘primary care physician’ is often used interchangeably with the term ‘family physician’ (Arya et al., 2017; Ponka et al., 2015). Hereafter, in this thesis the term ‘family physician’ (FP) will be used. Family medicine is not a recognised medical speciality in every LMIC, and even in those countries where it is recognised as a specialty, much of the primary care is still delivered by clinical officers (non-physician health professionals with up to three years of training), nurses, or community health workers (CHWs) rather than physicians (Arya et al., 2017; Rao et al., 2013). Several LMICs have only recently established training programmes for FPs and while graduates who do not specialise are considered to be ‘general practitioners’, few are specifically trained as FPs (Global Family Medicine, 2019). In contrast, other LMICs such as Malaysia, have well established programs for training FPs (Global Family Medicine, 2019). See Appendix A for a

full list of LMICs who recognise family medicine or have family medicine training programmes.

In 2002 the Europe division of The World Organisation of Family Doctors (WONCA) published a 'definition' of general practice/ family medicine which identifies eleven characteristics of family medicine (Allen et al., 2002). The first of these suggests that family medicine deals with any age of patient and any medical condition regardless of sex or other characteristic, that it is usually the point at which a patient makes first contact with healthcare services, and that this access should be open and unlimited. The document goes on to describe the importance of a multidisciplinary approach in family medicine, where the FP coordinates care with other health professionals as well as access to specialist services, acting as an advocate for their patient. In addition, the definition emphasises a person-centred, holistic approach, with continuity of care and a family and community orientation as central tenets. The FP must, by this definition, be able to deal with both acute and chronic conditions simultaneously in the same patient and must also be able to manage illnesses presenting early in their development and often in an undifferentiated way. This presents unique challenges for the FP and therefore, possibly, unique pressures. Finally, the FP approaches decision making in the context of community prevalence and incidence of disease, serious disease presenting less frequently in primary care, as opposed to presentations in secondary care. This is another unique challenge of family medicine as tests and clinical signs carry different predictive weight in the community setting and uncertainty is a much greater feature of family medicine (Allen et al., 2002).

Other researchers concur that the definition of family medicine includes the broad, generalised scope of any age and any medical condition, combined with a person-centred, holistic, and community-based approach (Arya et al., 2017; Ponka et al., 2015; Starfield et al.,

2005). Furthermore, they agree that the definition includes being a first point of contact with healthcare services as well as integrating and coordinating care with other disciplines while acknowledging that the 'gatekeeper' role that characterises family medicine in some countries is not universal (Arya et al., 2017; Ponka et al., 2015; Starfield et al., 2005). There is an understanding among global family medicine researchers that family medicine may look different in different healthcare systems, different regions, and different economies (Arya et al., 2017; Ponka et al., 2015). In countries where the burden of communicable disease is high and chronic disease less common, longitudinal care may be difficult, and acute episodic care more usual. Equally in countries where the physician to population ratio is low there may be more diversity in provision, with clinical officers, nurses, and traditional healers all playing a part in the delivery of primary care (Arya et al., 2017). However, many countries which have traditionally had high communicable disease burdens and low non-communicable disease (NCD) burdens, are now undergoing epidemiological transition with an increasing burden of NCDs (Ezzati et al., 2018) and as a result, shifting to a more longitudinal approach to care will be important.

Thus, the definition for FP that is used in this thesis is based on the WONCA 2002 definition and is as follows: any qualified FPs or FP residents, if the relevant country recognises family medicine as a speciality. Alternatively, any fully qualified generalist physician working in community medicine as a first point of contact for patients for at least part of their role, who is able to see any age patient for any type of medical problem.

1.2.2 Healthcare coverage and inequities

1.2.2.1 Healthcare coverage

Currently there is a global shortage of healthcare workers with estimates of total needs-based shortages in 2013 of 17.4 million (WHO, 2016). These shortages are greatest in the WHO Africa region, estimated to be around 4.2 million, and in the WHO South-East (SE) Asia region where estimates are around 6.9 million. The WHO predict that by 2030 the total shortage will decrease by approximately 17%, to just over fourteen million, but that shortages in the Africa region will increase to approximately 6.1 million (WHO, 2016).

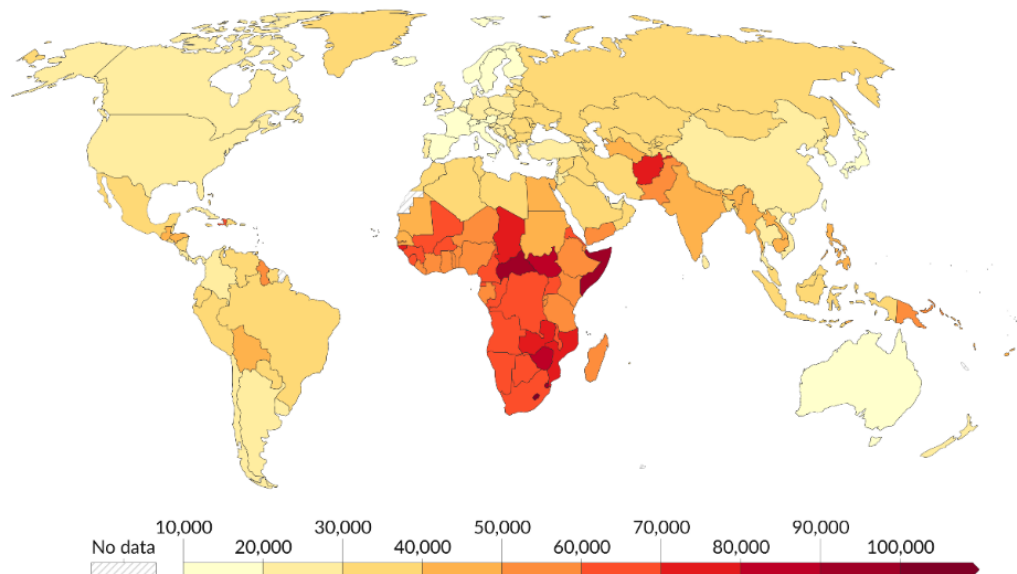
Of the 47 Africa region countries, 36 have critical healthcare worker shortages (defined as <2.3 per 1,000 population), and 8 have fewer than 0.8 healthcare workers per 1,000 population (WHO, 2013). Inequitable distribution of healthcare professionals relative to workload exacerbates these overall shortages of healthcare workers. For instance, only 4.4% of the world's trained healthcare workers work in sub-Saharan Africa (SSA), a region with 14% of the global population (WHO, 2016) and 25% of the global burden of disease (Crisp, 2011). Figure 1.1 illustrates the age-standardised geographical distribution of the global burden of disease and clearly demonstrates the high burden of disease in the Africa region relative to other regions. However, this inequity of workforce relative to workload is not limited to the Africa region. The SE Asia region also demonstrates this inequity with just 14.3% of the global healthcare workforce (WHO, 2016), for a quarter of the world's population and approximately 30% of the global burden of disease (Dhillon et al., 2012).

Figure 1.1 Geographical distribution of the global burden of disease

(Source: Roser et al., 2024, Copyright CC BY)

Burden of disease, 2021

Disability-Adjusted Life Years (DALYs) per 100,000 individuals from all causes. DALYs measure the total burden of disease – both from years of life lost due to premature death and years lived with a disability. One DALY equals one lost year of healthy life.



Data source: IHME, Global Burden of Disease (2024)

OurWorldInData.org/burden-of-disease | CC BY

Note: To allow for comparisons between countries and over time, this metric is age-standardized¹.

1. Age standardization: Age standardization is an adjustment that makes it possible to compare populations with different age structures by standardizing them to a common reference population. [Read more: How does age standardization make health metrics comparable?](#)

Data source: IHME, Global Burden of Disease (2024) – with minor processing by Our World in Data. “Age-standardized DALYs from all causes per 100,000 people” [dataset]. IHME, Global Burden of Disease, “Global Burden of Disease - Deaths and DALYs” [original data].

Inequitable distribution of the healthcare workforce applies not only between countries but also within countries with 63% of physicians, and 51% of nurses and midwives in the Africa region working in urban settings (WHO, 2013). Furthermore, in India, for instance, the urban/rural divide is stark with ten qualified physicians per 10,000 people in urban areas as opposed to one physician for every 10,000 people in rural areas (Rao et al., 2013; 2012). China also demonstrates an urban/rural divide. Chen and colleagues found that although overall numbers of healthcare professionals were steadily rising, there were still inequities of

distribution with 7.62 healthcare professionals per 1,000 population in urban areas, versus 3.04 healthcare professionals per 1,000 population in rural areas (Chen et al., 2014).

This urban/rural divide is not, however, unique to LMICs. Canada has 11.7 nurses and 2.6 physicians per 1,000 population in urban areas compared to 7.2 nurses and 1.1 physicians per 1,000 population in rural areas (Ariste, 2018). Furthermore, Douthit et al. (2015) documents that one of the barriers to accessing healthcare in rural areas in the United States of America (USA) is the paucity of services including FPs. This inequity creates workforce shortages at local levels in addition to the national and regional shortages. However, while this urban/rural divide may be more manageable in HICs where the health workforce to population ratio is greater to start with, in countries which already have significant needs-based shortages of healthcare workers this urban/rural divide may be critical for the workforce in more rural areas.

1.2.2.2 Inequities in health spending

In terms of health spending there are also significant inequities globally. On average, low-income countries spend just \$41 per head on healthcare while average spending per head in HICs is \$2,937 (WHO, 2019b). The healthcare spending in HICs accounts for 81% of the global healthcare expenditure, for just 16% of the global population (WHO, 2019b). This chronic underfunding of healthcare in countries with lower incomes leads to physical resource shortages and distribution challenges (WHO, 2016). For example, Mohsen Ibrahim (2018) suggests that many communities in LMICs lack access to basic hypertension (HBP) treatments, and even when available, they may not be affordable. Per capita health spend can be seen in Figure 1.2 to be inversely proportional to burden of disease with the highest burdens of disease, seen in the Africa region, correlating with the lowest per capita

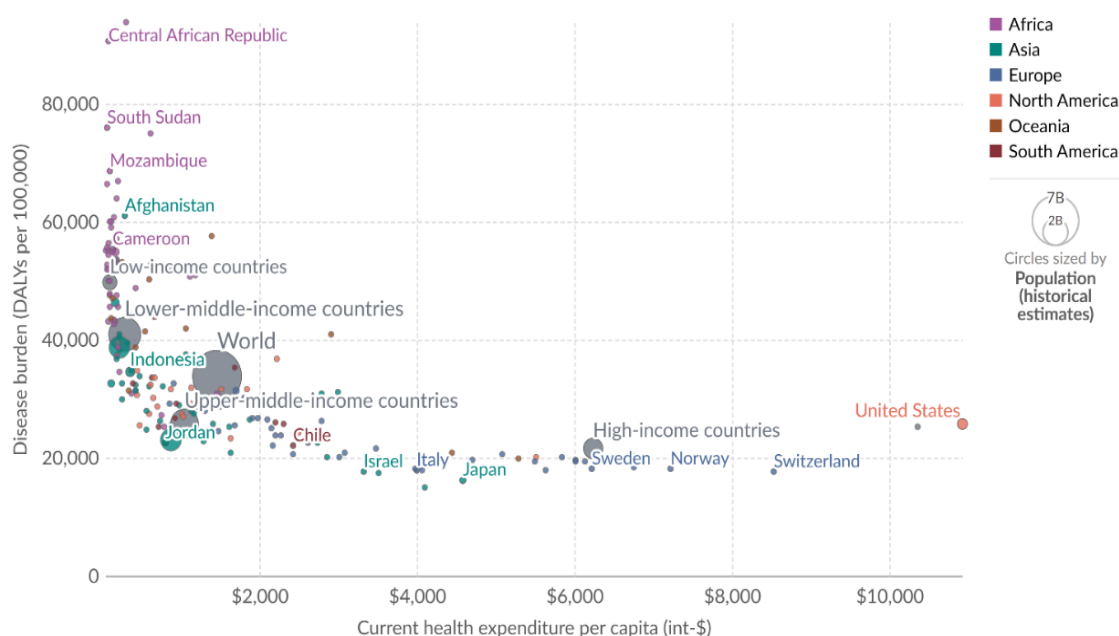
healthcare expenditure. This places real pressures on the healthcare workers working within these resource constraints in communities with high burdens of disease.

Figure 1.2 Burden of disease correlated with health spending

(Source: Roser et al., 2024 Copyright CC BY)

Disease burden vs. health expenditure per capita, 2019

Total disease burden from all causes, measured as the number of Disability-Adjusted Life Years (DALYs) per 100,000 individuals, versus health expenditure per capita measured in current international-\$



Data source: IHME, Global Burden of Disease (2024); World Health Organization (via World Bank)
OurWorldInData.org/burden-of-disease | CC BY

1.2.2.3 Inequities between healthcare sectors

Inequities also exist between the primary and secondary healthcare sectors and are not limited to LMICs. A study in China demonstrates significant disparities in resourcing between the primary healthcare sector and the secondary, or hospital, sector (Zhang et al., 2017). Despite the primary healthcare sector delivering the majority of healthcare, the hospital sector attracts more, and better-quality resources, both in human resources and health technologies. Zhang et al. (2017) observe that this raises concerns about the emergence of a two-tier system in China, where the wealthy, who can afford higher quality care, favour the

hospital sector, and those less wealthy, who cannot afford hospital care, favour the primary healthcare sector. Healthcare resources are concentrated in the more urban regions which have higher population densities leading to significant regional disparities in these resources and a greater burden on primary healthcare in more rural, less densely populated regions (Zhang et al., 2017). This concentration of healthcare resources and secondary care facilities in urban areas is not confined to China but occurs elsewhere in both LMICs and HICs (Ademiluyi and Aluko-Arowolo, 2019; Balarajan et al., 2011; Douthit et al., 2015).

There is some evidence for disparities between the funding of primary and secondary care sectors in HICs such as the UK. A 2011 King's Fund report states that while general practice/primary care receives just under 8% of the total National Health Service (NHS) budget, 90% of NHS consultations are carried out in general practice/primary care (Goodwin et al., 2011). While this may largely reflect the cost of investigating and treating patients in secondary care, and the efficiency of primary care in carrying out their 'gatekeeper' role, funding inequities leading to resource – workload imbalances in primary care cannot be excluded.

1.2.3 Healthcare workload in low- and middle- income countries

Not only do LMICs account for a greater proportion of the global disease burden, but the disease burden itself is very different in LMICs from that of HICs. In LMICs the disease burden is characterised by a higher prevalence of communicable disease than in HICs, which may contribute its own stresses for healthcare professionals in these countries. For example, in 2022 there were 10.6 million new cases of tuberculosis globally. Just eight countries, all LMICs, account for two-thirds of these new cases, with 46% occurring in the SE Asia region, 23% in the Africa region and 18% in the Western Pacific region (WHO, 2023b). Furthermore,

in 2022, 94% of the 249 million global cases of malaria, and 95% of global malaria deaths, occurred in the Africa region and this region also accounts for two-thirds of those living with HIV/AIDs (25.6 million cases) (WHO, 2023c, 2023d). In addition to the workload that this high incidence of communicable disease creates, it introduces other stressors for the healthcare professional such as the risk of infection; stigma, especially with HIV/AIDs; and the moral distress that results from not having the resources to treat 'easily' treatable conditions (Harrowing and Mill, 2010; Raviola, 2015; Wendland, 2010). In combination with this high burden of communicable disease, many LMICs are also experiencing an increase in life expectancy, correlated with an increasing prevalence of NCDs, together with an epidemiological transition from communicable disease to NCD (Ezzati et al., 2018). Statistics from 2016 clearly demonstrate this transition showing that while NCDs accounted for 55% of the mortality in Africa, India, SE Asia, and Latin America and the Caribbean, communicable diseases, nutritional deficiencies, and maternal and peri-natal disorders accounted for only 34% (Ezzati et al., 2018).

There is also an overlap between communicable and non-communicable disease. For example, several cancers have infectious aetiologies, such as the papilloma virus and cervical cancer, or schistosomiasis and bladder cancer (Remais et al., 2013), and there is an established association of both HIV/AIDs infection and antiretroviral therapy with the development of type 2 diabetes (Noubissi et al., 2018). Moreover, infectious aetiologies such as rheumatic fever, contribute to the burden of cardiovascular (CVD) disease in LMICs, albeit only a small amount (Ezzati et al., 2018). The prevalence of other risk factors for CVD, such as HBP, are increasing in LMICs with recent evidence suggesting that 85% of the global burden of CVD exists in LMICs, and mortality rates from CVD in LMICs are significantly higher than those seen in HICs (Mohsen Ibrahim, 2018; Teo and Dokainish, 2017). The increasing burden of NCDs will necessitate changes in the structure of health systems in LMICs with a greater

emphasis on long term care needs and the integration of NCD management into current primary care systems (Ahmed et al., 2024; Remais et al., 2013). Furthermore, the development of screening programmes for NCDs will be required and there will be additional burdens on vaccination programmes (Ezzati et al., 2018). This, combined with other healthcare stressors, for example the COVID-19 pandemic, has the potential to over-stretch a workforce and systems already constrained by a lack of adequate resources both in terms of the availability of basic medicines and medical equipment, and in terms of staffing (Remais et al., 2013).

The capability in primary care for health promotion and education, and disease prevention and control, and the cost-effectiveness of primary care, means that it is perfectly placed to play a leading role in responding to the increasing burden of NCDs (Ahmed et al., 2024; Maher and Sekajugo, 2010). However, this may well constitute a 'perfect storm' for the well-being of primary healthcare practitioners in these countries. Raviola (2015) describes the impact that the combination of high disease burden and lack of resources has on the mental well-being of physicians in Africa as a major crisis. He goes on to suggest that the limited treatment /intervention options due to scarcity of resources, combined with increasing patient numbers, leads to profound demoralisation and a sense of decreasing professional competence. The HIV/AIDS pandemic introduces additional challenges such as diagnostic difficulties, a lack of treatments, the lack of normal disease variation which impacts on training, the risk of infection for the healthcare professional, often exacerbated by unsafe working environments, and the social stigma associated with the infection (Raviola, 2015; Wendland, 2010). All of this, compounded by the COVID-19 pandemic, threatens the mental well-being of healthcare professionals working in these countries, and may lead to future recruitment difficulties as the healthcare profession generally, and primary care more specifically, are perceived as less desirable career options.

Wendland's ethnography of medical training in Malawi discusses the impact of high workloads and a lack of resources on medical students as they progress from pre-clinical years to clinical years and then to internships (Wendland, 2010). Frustration with the insufficiency of the basic resources needed to treat patients appropriately is a common theme and Wendland describes the progression of medical students from the excitement and idealism of pre-clinical years to pain and anger during their clinical training years, as they witness the impact of this lack of resources on patient care. The lack of adequate equipment and medical supplies often leads to the death of patients who, in other health systems, with adequate resources, would have survived. Students describe the heavy workloads as 'dehumanising' where there is no time to effectively manage patients and speak of a "helplessness-induced fatigue" (p. 131). Wendland also observes that despite this there is no real narrative of emotional detachment and distancing during the course of medical training in Malawi as is described in the sociology of medical training in North America, and a cynical attitude towards patients is not a feature of their conversations. She posits that this may be due to cultural differences especially in the relative importance of community and relationships and in the way that individuals view death. This is interesting from a burnout point of view as it may lead to differences in the way that physicians experience or express burnout regarding the DP dimension.

Nearly a third of the clinical students that Wendland interviewed stated that they felt progressively worse about themselves throughout their clinical training as the lack of resources and overwhelming workload led to disillusionment, feelings of inadequacy and moral compromise (Wendland, 2010). This is potentially highly significant regarding the development of burnout in younger age groups and early career physicians as it is these medical students who go on to form their country's physician workforce and it may be that their journey towards burnout begins during medical school.

1.3 Rationale for study

This thesis will investigate the prevalence of burnout, the associated factors and determinants, and the experiences of burnout among FPs in LMICs. Given that workforce and staffing shortages, resource scarcity, and heavy workloads are established risk factors for burnout in healthcare professionals, and that these risk factors are present in many LMICs, it follows that the burden of burnout in healthcare professionals in these countries is likely to be substantial. As discussed previously, the consequences of burnout are significant and include impacts on physical and psychological health as well as increased sick leave, turnover, and migration, and consequences for patient safety. These lead to substantial economic costs. Furthermore, primary care is essential to achieving UHC and as the prevalence of NCDs increases in LMICs, primary care will find itself at the centre of system change for managing these conditions. This places FPs in a precarious position where already high and increasing workloads combine with insufficient resources and staff shortages to place them at considerable risk of burnout. In turn, high levels of burnout may lead to a combination of recruitment difficulties as primary care becomes a less attractive career option, and increased understaffing as physicians become unwell and go on sick leave, migrate, or simply leave the profession creating a 'vicious cycle'. Thus, it is vital to determine the burden of burnout among healthcare professionals in LMICs, together with the factors associated with burnout, and the impact on FPs. This may then inform the development of interventions to mitigate the potential consequences of burnout.

Moreover, there is a paucity of research into burnout in FPs in LMICs. A 2018 systematic review of burnout in primary healthcare providers in LMICs included just twenty studies, only two of which looked specifically at burnout in physicians (Dugani et al., 2018). In addition, a

2019 systematic review on burnout in healthcare providers in sub-Saharan Africa found just twelve studies on burnout in physicians, none of which looked specifically at primary care/ family physicians (Dubale et al., 2019), and a global systematic review of burnout in physicians found just four studies on primary care/ family physicians in LMICs (Rotenstein et al., 2018). This paucity of research in LMICs will be examined further in the systematic review of burnout prevalence in primary care professionals in LMICs conducted as part of this thesis, and the findings will be presented in Chapter 4. However, in view of the risk factors that exist in LMICs coupled with the significant leadership role of FPs and the apparent dearth of research in this particular group of physicians, there is an urgent need for further research into the prevalence of burnout among FPs in LMICs.

Chapter 2 Aims and objectives of research

2.1 Aims and objectives

As outlined in the introductory chapter, there is both a paucity of research into burnout in FPs in LMICs, and substantial risk factors for the development of burnout in these countries and for this group of professionals. Therefore, the aim of this research is to investigate the prevalence of burnout, the associated risk and protective factors, and the experience of burnout in FPs in LMICs.

The aim of this research will be achieved through the following specific objectives:

1. To estimate the prevalence of burnout in FPs in LMICs
2. To identify factors associated with burnout including risk factors or protective factors, in FPs in LMICs
3. To explore factors relating to work-related stress and burnout in FPs in LMICs

2.2 Structure of thesis

This thesis contains nine chapters. Two literature review chapters follow this chapter. The first provides a narrative review of burnout. Burnout is a phenomenon that has been extensively researched in HICs and therefore, a review of what defines burnout, its distinction as a construct, its aetiology, the measurement tools used to measure it, the factors associated with it, its consequences and possible interventions provides necessary background for any research into its impact on particular groups in particular settings. The second literature review chapter is a systematic review and meta-analysis of research on the prevalence and associated factors of burnout among primary healthcare professionals more

generally, and following that, more specifically among FPs in LMICs. The systematic review aims to identify the gaps which exist in our current knowledge of burnout in this group of healthcare professionals in this setting and to provide context for this thesis. Pooled prevalence for each dimension of burnout measured using the MBI is presented along with a discussion of the factors associated with burnout.

Following these literature review chapters is a fifth chapter that outlines how this study was conducted. It begins by introducing the underlying research philosophy, and then sets out, and justifies, the methodology and methods used for this research. This chapter also discusses the multinational setting of the research, the collaborative process, and each country's ethical approval requirements. Subsequent to the methodology chapter, Chapters 6 and 7 present the research findings. Quantitative questionnaire results are presented first, including the findings for the prevalence of burnout and the factors associated with it. This is followed by the qualitative findings and an integration of both quantitative and qualitative results.

The thesis concludes with two discussion chapters. Related to the multinational setting of the research and the need for multiple collaborative partnerships, a more reflective chapter, Chapter 8, follows the results chapters, detailing some of the challenges faced, some possible solutions, and the learning points experienced. Finally, Chapter 9 discusses the findings in relation to the aims and objectives of the thesis and in relation to the wider literature. The strengths and limitations of the study are also discussed together with the implications of these findings for FPs, for health systems, and for future research.

Chapter 3 A review of burnout

This chapter provides a foundation for understanding burnout in a more general context before Chapter 4 goes on to examine burnout more specifically in primary care professionals working in LMICs. In this chapter an overview of burnout literature is presented, beginning with a discussion of the definition of burnout and its distinctiveness as a construct, and going on to explore the aetiology of burnout in terms of its underlying theoretical framework. The factors associated with burnout are then explored, along with the variety of measurement tools available for the measurement of burnout. Finally, the consequences of burnout and existing interventions are discussed.

3.1 Defining burnout

3.1.1 Towards a unifying definition of burnout

Despite over 50 years of research into the burnout phenomenon there is still no consensus on a definition for burnout. A recent review of the prevalence of burnout in physicians identified 142 different definitions of burnout syndrome, based on both the number of different measurement tools used and also on how researchers apply these tools to define levels of burnout (Rotenstein et al., 2018). Another review identifies 88 unique definitions of burnout, based on eleven original definitions (Guseva Canu et al., 2021). This lack of consensus raises difficulties both for the interpretation and aggregation of current burnout research, especially regarding estimates of the prevalence of burnout, and for the design of research studies going forward.

The most widely used definition, and the one used by the WHO, is based on early research by Maslach, and defines burnout as the gradual depletion of psychological and physical energy in response to chronic workplace stress, characterised by the three dimensions of 1) emotional exhaustion, 2) depersonalisation, or cynicism, and 3) reduced personal accomplishment or professional inefficacy (Maslach, 1982, 1998; Schaufeli et al., 1993; WHO, 2019a). The exhaustion component refers to overwhelming fatigue, a depletion of resources, being worn out, or overextended; and the cynicism or depersonalisation component refers to withdrawal or excessive detachment, irritability, and 'callous disregard'. Reduced personal accomplishment encompasses feelings of incompetence or perceived inefficacy, and reduced productivity or achievement, together with self-doubt and low self-esteem (Maslach et al., 2001; Maslach and Leiter, 2016).

While some researchers disagree with this proposed three-dimensionality of burnout, there is broad agreement that exhaustion is the central component of burnout (Cox et al., 2005; Kristensen et al., 2005; Lee and Ashforth, 1996; Schaufeli and Buunk, 2003; Schaufeli and Greenglass, 2001). Indeed, some burnout measurement tools, which are reflections of varying definitions of burnout, only measure the exhaustion component, dividing it into the two domains of physical and psychological exhaustion, or three domains of physical, mental, and emotional exhaustion (Kristensen et al., 2005; Pines and Aronson, 1988, cited in Malach-Pines, 2005; Schaufeli and Greenglass, 2001). In some studies (Račić et al., 2019) burnout is measured using the Professional Quality of Life Scale: Compassion Satisfaction and Compassion Fatigue questionnaire (ProQOL) (Hudnall Stamm, 2009) introducing another, slightly different, conceptualisation of the fatigue and exhaustion associated with burnout. More recently, burnout has been defined as the two dimensions of exhaustion and disengagement reflected in the OLBI (Demerouti and Bakker, 2008). Exhaustion here is a broader concept, encompassing physical, emotional, and cognitive elements, and the

concept of disengagement from work correlates with the withdrawal associated with Maslach's DP dimension. Interestingly, this two-dimensional conceptualisation of burnout also reflects the very earliest research findings that exhaustion and excessive detachment were the two central themes in the experience of burnout (Maslach, 1978; Maslach et al., 2001; Wills, 1978). Related antithetical concepts include job satisfaction, engagement, organisational commitment, and motivation (Demerouti et al., 2010; Maslach et al., 2001; Schaufeli and Enzmann, 1998; Schaufeli, 2017b; Taris et al., 2017).

There is much debate about the relationship of the three different dimensions that make up Maslach's definition of burnout. While the core component of exhaustion is generally agreed, Kristensen et al. (2005) argue that DP is a coping mechanism that develops in response to the core element of fatigue, and that reduced PA, contrary to being a core element, develops as an outcome or consequence of burnout. Thus, they suggest that these two concepts represent separate phenomena and should be studied separately in their own right as a coping mechanism and consequence, respectively. A meta-analysis of the correlates of Maslach's three dimensions also found that while EE and DP are strongly correlated, the dimension of PA is only weakly related to the other two dimensions, suggesting that it may develop independently and adding weight to the argument that it is a consequence of burnout rather than a core element (Lee and Ashforth, 1996).

Different definitions of burnout are not only derived from differences in the conceptualisation of burnout but also, from the way in which measurement tools are used to classify levels of burnout. For example, the MBI generates three separate scores, one for each of the burnout dimensions. The manual recommends that subscale scores are not combined into a single score, but that they are classified separately as representing a low, moderate, or high level of each dimension according to cut-off scores for each subscale

(Maslach et al., 1996). Not only are there variations in the cut-off points used by different studies, but there are also differences in the classification methods for overall burnout (Rotenstein et al., 2018). Some studies choose to classify an overall high level of burnout as a high score in all of the three subscales (Ramirez et al., 1996), while others classify a high level of burnout as high scores in at least two of the subscales (Kotb et al., 2014), and still others classify it as a high score in at least one subscale (Grunfeld et al., 2000). Others combine the subscale scores for a total score (Al Dabbagh et al., 2019), or use a formula to calculate an overall score (Kalimo et al., 2003). This, in combination with the multiplicity of measurement tools, leads to a lack of consistency in the measurement of burnout and contributes to widely varying estimates for the overall prevalence of burnout.

In an attempt to unify these different definitions Guseva Canu et al. (2021) conducted an analysis of defining concepts and, together with a panel of burnout experts, developed the following definition of burnout: "In a worker, occupational burnout or occupational physical AND emotional exhaustion state is an exhaustion due to prolonged exposure to work-related problems" (Guseva Canu et al., 2021, p.10). This definition focuses on the core element of work-specific exhaustion as the defining aspect of burnout. However, limiting burnout to the core dimension of exhaustion, even if specifically related to the work domain, raises questions regarding its distinctiveness as a construct, as discussed in the following section. Similarly, confining burnout to the 'work' domain may also be problematic unless a broader definition of 'work' is used that includes categories such as athletes, parents, and voluntary workers (Schaufeli, 2021). It remains to be seen, therefore, if this new definition will gain general acceptance among burnout researchers, or whether those definitions that most closely reflect the most popular measurement tools, will continue to be widely used.

3.1.2 Is burnout a distinct construct?

Linked to the debate surrounding the definition of burnout is the considerable debate around the distinctiveness of burnout and its overlap with various other exhaustion syndromes such as depression, and chronic fatigue. Scholars have criticised the conceptualisation of burnout, pointing out flaws in both the initial development of the burnout construct, and in the development of the MBI, the measurement tool that dominates burnout research (Bianchi et al., 2015a). Not only did early research into burnout exclude the systematic investigation of the presence of any other stress-related condition such as depression (Bianchi et al., 2015a), but Schaufeli (2003, p.3) observes that the development of the MBI “...is neither grounded in firm clinical observation nor based on sound theorising. Instead, it has been developed inductively by factor-analysing a rather arbitrary set of items”. This questionable conceptual foundation brings into question the status of burnout as a distinct syndrome, separate from other stress-related conditions.

3.1.2.1 Burnout and depression

Bianchi and colleagues (2015a) argue persuasively that there is considerable overlap between burnout syndrome and depression suggesting that burnout may simply be a form of depression and highlighting the symptomatologic similarities between burnout and atypical depression. They cite evidence from a 2014 study which found that 90% of teachers that met the criteria for burnout also met the criteria for a diagnosis of depression (Bianchi et al., 2014), as well as longitudinal studies finding significant clustering of burnout and depression with symptom overlap (Ahola et al., 2014; Bianchi et al., 2015b). Similar findings from a second study in teachers also suggest an overlap of burnout with depression, finding that 86% of those with burnout, but less than 1% of those without burnout, also met the criteria

for depression (Schonfeld and Bianchi, 2016). Other recent studies, examining the distinctiveness of burnout from depression concur with this standpoint, finding a lack of evidence for the distinctiveness of burnout (Schonfeld et al., 2019; Verkuilen et al., 2021; Wurm et al., 2016). In addition, emotional exhaustion, the core component of burnout, is more strongly associated with depression than with either of the other two dimensions of burnout raising further questions about the conceptualisation of burnout (Verkuilen et al., 2021; Wurm et al., 2016). However, given this commonality of exhaustion to both depression and burnout, it follows that the association of depression with burnout may be overestimated in studies using a unidimensional measurement tool for burnout that focuses solely on exhaustion (Maslach and Leiter, 2016).

Causal attributions in burnout are important as one of its defining features is as an occupational phenomenon. However, Bianchi and Brisson (2019) demonstrated that while 44% of the participants in their study attributed their burnout symptoms to occupational stress, 39% of participants with depression also attributed their depressive symptoms to occupational stress. In addition, occupational factors such as job insecurity or lack of reward have been shown to be predictive of both major depressive disorder and generalised anxiety disorder (Niedhammer et al., 2015). These findings are of concern to those arguing for burnout's distinctiveness from other stress-related conditions, as the specificity of burnout to the work domain is often emphasised as a key factor distinguishing burnout from depression (Maslach et al., 2001).

However, there is another school of thought that argues that although burnout and depression are related, they represent two distinct constructs. Maslach and Leiter (2016) criticise Bianchi and colleagues for their use of both a unidimensional burnout measurement tool that focuses on exhaustion, and an abbreviated depression measurement tool that also

focuses on exhaustion. They argue that this results in a loss of nuance between the two conditions and an exaggeration of their overlap. Two measurement tools that each focus on exhaustion will always correlate highly with each other, therefore the results merely reflect this weakness in study design. Maslach and Leiter (2016) concede that depression and burnout are related constructs and that their relationship is complex, however, they argue that the multidimensional concept of burnout, which includes DP and inefficacy, is distinct from depression. A study by Golonka et al. (2019) supports this viewpoint, finding that although depression overlaps with the exhaustion component of burnout, the DP aspect of burnout is consistently determined largely by organisational context.

A recent qualitative study, exploring how individuals who self-identified as having suffered from both burnout and depression distinguished between the two, found 11 main areas of difference (Tavella and Parker, 2020). These encompass differences in attribution, level of functioning, symptoms such as anhedonia and hopelessness, and suicidal ideation. The results of a systematic review and meta-analysis also argue for the distinctiveness of burnout from depression finding that although these two syndromes do share some characteristics, they are likely to be separate constructs (Koutsimani et al., 2019). Furthermore, a recent study in Brazil has found that burnout is empirically distinct from depression and anxiety and suggests that an appropriate diagnosis requires separate screening for both burnout and depression (Fischer et al., 2020). Several other studies, including longitudinal studies, concur with the finding that burnout and depression, although related, are empirically distinct (Bakker et al., 2000a; Hatch et al., 2019; Iacovides et al., 2003; Toker and Biron, 2012; Tóth-Király et al., 2021). Although, more research is necessary to elucidate the relationship between depression and burnout, current evidence suggests that they are related but empirically distinct constructs.

3.1.2.2 Burnout and chronic fatigue

Debate has arisen along similar lines as to whether burnout is distinct from chronic fatigue syndrome (CFS) as both have exhaustion at their core and are associated with stress. Leone et al. (2011) describes several themes common to both burnout and CFS including: depleted energy and overload; withdrawal - psychological withdrawal in burnout versus physical withdrawal in CFS; and a common patient stereotype of being hardworking and dedicated. However, there are also differences between the two syndromes, the main one being one of context with burnout occurring specifically in relation to chronic work stress, whereas CFS may occur more generally (Leone et al., 2008; Schaufeli and Enzmann, 1998). Another difference is that of attribution with burnout being described largely in psychological terms, whereas CFS is described largely in somatic terms (Huibers et al., 2003; Leone et al., 2011). In addition, Doerr and Nater (2017) suggest that while the overlap between CFS and burnout may encompass both the EE and the reduced PA dimensions, the DP dimension appears to be unique to burnout. Thus, the DP dimension appears to distinguish burnout from both depression and CFS (Doerr and Nater, 2017; Golonka et al., 2019). In conclusion, despite a clear overlap, measurement tools can discriminate between burnout and CFS provided that the burnout tool used is not limited to the exhaustion dimension, suggesting that the two syndromes are indeed distinct (Leone et al., 2007).

3.2 Theoretical models - A conceptual framework for burnout

3.2.1 Interpersonal approaches

Several different theoretical frameworks have been suggested for the aetiology of burnout. These are divided into three main approaches: the interpersonal approach; the individual

approach; and the organisational approach (Schaufeli et al., 1993). The interpersonal approach focuses on the relational stresses that lead to emotional exhaustion with Maslach and Jackson (1981) arguing that burnout is a result of the accumulated stresses of emotional interactions, often intense, between a carer and recipient as occurs in human service occupations such as healthcare. This accumulated stress leads to emotional exhaustion, carers withdraw from their clients, becoming cynical and excessively detached, and progressively dissatisfied with their performance. These three dimensions, emotional exhaustion, detachment, and dissatisfaction with performance, form Maslach's definition of burnout and are, consequently, the basis for the measurement tool, the MBI (Maslach and Jackson, 1981).

Buunk and Schaufeli (1993) also argue from an interpersonal viewpoint, using social comparison theory to suggest that burnout develops in a social context, due to the imbalance in social relationship between provider and recipient. This leads to emotional exhaustion and withdrawal. In this theory, exhaustion is central with depersonalisation viewed as a coping mechanism. Personality characteristics are important as they determine the reaction of the individual to the social stresses experienced. Buunk and Schaufeli (1993) posit that there may be a 'contagious' aspect to burnout with individuals more likely to develop and sustain burnout symptoms if colleagues are also suffering from burnout.

In addition, Pines (1993) argues from an existential point of view, that there is a need to find meaning in one's work. The failure to do so, and subsequent disillusionment is what leads to burnout. Those who feel that their work is a vocation or calling and who derive a sense of significance from their work can thrive even in stressful jobs, while those who have high expectations of significance in their work, but then fail to achieve it, are at risk of burnout. Pines' definition of burnout also recognises exhaustion as the core component and divides it

into the three categories of physical, emotional, and mental exhaustion, measuring it with a tool called the Tedium (or Burnout) Measure (TM) (Pines et al., 1981). Pines, along with Cherniss (1993), recognises the importance of self-efficacy and competence as core constructs, arguing that their importance lies in their contribution to the sense of significance of work.

3.2.2 Individual approaches

Several researchers adopt a more individual approach. Burisch (1993) takes the view that at the root of burnout is a loss of autonomy or frustrated goal realisation that the individual fails to deal with. He calls this a 'disturbed action episode' and argues that, while one disturbed action episode may result in stress, it is the failure to remedy this disturbed action episode that leads to secondary stress, and a failure to cope with this secondary stress that leads to burnout. Hence, there is a pattern of chronic stress developing as the precursor to burnout.

Hallsten (1993) agrees with Burisch that frustrated goals, or as he puts it 'frustrated strivings' are precursors to burnout but postulates that burnout and depression are linked, and that burnout may simply be a form of depression or a pathway to depression. Certain individual characteristics may make some more vulnerable than others to developing burnout. For example, those with good self-esteem, high levels of support outside of work, and those for whom work is not self-definitional, are protected from burnout, as are those who are strongly goal orientated and have a work environment which is well-resourced for achieving those goals.

Conservation of resources (COR) is a theory within stress psychology which postulates that individuals are motivated to conserve resources, and that stress occurs as a result of

resources being threatened, lost, or invested, with little return (Hobfoll, 1989). Hobfoll (1989) defines resources as those things that an individual values, such as time, finances or material possessions, family relationships, work, or skills, and acknowledges that these may differ across cultures. Hobfoll and Freedy (1993) suggest that COR provides a reasonable framework within which to understand the aetiology of burnout and the relationship of stress to burnout. In this framework, workers are most sensitive to those aspects of their work that translate into losses such as interpersonal conflict which may translate into a loss of social support, or job insecurity which may be a threatened loss of work. Gain is also important in this model but only as far as it protects against vulnerability to loss. Therefore, a pattern of chronic, minor losses, or insufficient gains following significant investment of resources, leads to chronic stress which in turn leads to burnout (Hobfoll, 2001). This is an interesting model from an interventional point of view as interventions in the workplace can be targeted to mitigate potential losses, or to improve available resources.

3.2.3 Organisational approaches

Others argue from an organisational point of view that it is aspects of the work environment that most influence the development of burnout. Organisations can be categorised as either 'machine bureaucracies' or 'professional bureaucracies' with the antecedents of burnout being different in different organisational types (Winnubst, 1993). For example, in a 'machine bureaucracy' where there is an emphasis on manual work and tight regulation, burnout results from unmitigated routine, the physicality of the work and the restrictiveness of regulation whereas in a 'professional bureaucracy' lack of work structure, high workload, and interpersonal conflict may be the factors that lead to burnout (Winnubst, 1993). Cox et al. (1993) introduce the debate on whether burnout is separate and distinct from occupational

stress and on what the relationship is between exhaustion and the other two dimensions in the multidimensional model. They posit that the healthiness of an organisation is related to the stress and well-being of its workers with stress often being the result of a mismatch between the resources of the worker and the demands placed upon them, echoing the main postulates of the COR theory. Furthermore, the importance of supporting the worker to meet demands is emphasised. In addition, they suggest that there is less stigma attached to occupational stress or burnout as opposed to other forms of stress or depression as the focus is on the interaction between the individual and their work environment rather than the individual alone.

Self-efficacy is the belief that one is capable of the behaviour necessary to ensure a desired outcome or to meet a goal (Bandura, 1977). Therefore, professional self-efficacy is related to perceived competence and is the belief that one is capable, within the work sphere, of behaviour that ensures the realisation of professional goals (Cherniss, 1993). Cherniss (1993), although agreeing with Pines (1993) that self-efficacy is central, argues from an organisational point of view that the work environment influences professional self-efficacy. Moreover, the achievement of meaningful goals across three different domains: task; interpersonal; and organisational; increases professional self-efficacy and protects against burnout. The task domain comprises the technical aspects of a job, the interpersonal includes client and colleague relationships, and the organisational domain relates to a person's ability to be an influence for change within an organisation. The importance of perceived efficacy or competence within these frameworks, and its increase as goals are achieved, may account for the finding that burnout risk is higher in early to mid-career (Dyrbye et al., 2013).

There are clearly common threads running through these different conceptual arguments. The centrality of exhaustion as a component of burnout is widely agreed, even if the source of the exhaustion is debated. Likewise, the protective importance of professional self-efficacy and having the ability, resources, and organisational support to meet the demands of a job are recurring concepts. Goal frustration and loss are also central concepts in the aetiology of burnout. Overall, there is little argument that burnout is the result of chronic workplace stress.

3.2.4 The job demands-resources model

Subsequently, researchers have adopted the job demands-resources model (JD-R) as a unifying framework for these differing aetiological viewpoints (Demerouti et al., 2001). This model combines many of the concepts previously postulated but is most closely aligned with the COR theory (Hobfoll, 1989) and builds on two earlier stress models: the job demand-control model developed by Karasek (1979); and the effort-reward imbalance model developed by Siegrist (1996) (Bakker and Demerouti, 2007). Unlike these earlier stress models which concentrate only on the stress process, two processes underlie the JD-R model: a negative stress process leading to depletion of energy, impaired health, and burnout; and a positive motivational process, leading to increased engagement in work and positive organisational outcomes (Schaufeli, 2017b; Schaufeli and Taris, 2014). This allows examination of both the negative characteristics (demands) and the positive characteristics (resources) of work enabling the study of both burnout and its antithesis, engagement, within the same model (Schaufeli, 2017b; Van den Broeck et al., 2008). Additionally, it results in a flexible model with broad scope as it does not define specific demands or resources,

which may vary across occupations and workplaces, but posits that any work-related demand or resource may impact well-being (Schaufeli and Taris, 2014).

As discussed in Chapter 1, the JD-R theory posits that burnout develops in response to a prolonged mismatch of job demands and job resources leading to chronic stress which culminates in burnout (Bakker and Demerouti, 2007). When job demands are high and there are inadequate job resources to meet those demands, or when there is inadequate recovery from excessive demands, then this imbalance may lead to burnout. Conversely, an abundance of job resources stimulates fulfilment and job engagement (Schaufeli and Taris, 2014). Job demands are defined as those job characteristics which require constant effort and expertise, thus depleting energy and resources, while job resources are those job characteristics which decrease demands or contribute towards professional development and the achievement of goals (Bakker and Demerouti, 2007). More recently, the category of job resources was extended to include both organisational job resources and personal resources such as self-efficacy and optimism (Tremblay and Messervey, 2011). Examples of job demands are heavy workloads, interpersonal conflict, and job insecurity, while job resources include positive feedback, supervisory support, and opportunities for professional development and training (for an extensive list see Schaufeli and Taris, 2014). A growing body of research, including both cross-sectional and longitudinal studies, supports the JD-R model. Indeed, a recent meta-analysis of longitudinal studies found 29 high quality longitudinal studies focused on validating the JD-R model, and meta-analysis confirmed the assumptions of the JD-R model, that excessive job demands, and poor resources lead to burnout and that abundant job resources result in job engagement (Lesener et al., 2019). However, not all demands result in negative outcomes. Consequently, some researchers have divided the category of job demands into challenges and hindrances, arguing that a demand

perceived as a challenge may lead to professional development, mastery, and eventual gain, whereas demands perceived as hindrances thwart achievement and personal growth (Cavanaugh et al., 2000; Crawford et al., 2010; Lin et al., 2009; O'Brien and Beehr, 2019). For example, the job demand of workload may, in some circumstances, be stimulating and lead to goal achievement and feelings of increased competence. Conversely, workers may perceive job insecurity, also categorised as a job demand, as a threat, limiting the achievement of professional goals (Van den Broeck et al., 2010). The critical element in differentiating between what constitutes a challenge or a hindrance is the balance of resource gain versus resource loss, with a net resource gain defining a challenge and a net resource loss defining a hindrance (O'Brien and Beehr, 2019). This is consistent with COR theory. It may also be that the presence of personal resources such as self-efficacy and resilience increase the likelihood that a job demand will be perceived as a challenge rather than a hindrance (Ventura et al., 2015). Crane and Searle (2016) investigated the relationship of job challenges and hindrances with resilience using a longitudinal study design and found that stressors perceived as challenges facilitated the development of future resilience, while stressors perceived as hindrances had a negative impact on future resilience. They also demonstrated that hindrances alone predicted strain at three months.

Evidence also suggests that demands and resources do not exist in isolation, but that they influence each other forming 'spirals' of loss and gain (De Cuyper et al., 2012; Hakanen et al., 2008; Hobfoll, 2001, 1989; Llorens et al., 2007). For example, a job demand may lead to a loss of resources which in turn leads to an increase in job strain leading to further loss. In a similar way, personal resources may lead to job successes which in turn lead to the mobilisation of additional resources (Hobfoll, 2001). In addition, COR theory posits that resources cluster in 'resource caravans' so that those with one resource, such as self-efficacy, are more likely to also possess other resources, such as strong social support networks

(Hobfoll, 2002). Sung et al. (2020) demonstrated that employees deploy the personal resource of emotional competence to secure and generate other resources, such as colleague feedback, and improve creativity, forming resource caravans. By ensuring that organisational resources are abundant and accessible, employing organisations have a role in creating an environment that supports the investment of employee resources for the generation of further resources and the creation of these resource caravans (Hobfoll, 2011). This is one way in which organisations can reduce the risk of burnout for their employees.

3.3 Factors associated with burnout

Although the factors associated with burnout can be categorised as either job demands or job resources in line with the JD-R model of burnout, this section will categorise them as organisational and personal. This is for ease of reading, as many organisational and personal factors may be categorised as either demands or resources depending on whether they are present or lacking, and to discuss them separately would be repetitive. Alongside these organisational and personal factors, certain demographic factors may also be associated with burnout, and these will also be discussed. Much of the research into associated factors is cross-sectional, thus causal inferences cannot be made from these studies. This section has informed the development of the questionnaire and the interview topic guide for this thesis.

3.3.1 Organisational factors

Early research into burnout identified organisational factors, such as heavy workloads, long work hours, scarce resources, and lack of positive feedback from clients, as factors associated with the development of burnout (Freudenberger, 1974, 1975). Subsequent research has continued to build on the evidence for an association of these core factors with burnout, as

well as identifying other associated factors. Leiter and Maslach (1999, 2003) consolidate the wide variety of workplace factors associated with burnout into six main domains of workplace predictors of burnout. These domains are as follows: workload, control, reward, community, fairness, and values.

The category of workload encompasses the volume of work in terms of assigned tasks, the complexity of the tasks, and the degree of responsibility associated with them. It also includes hours worked, shift patterns, and time pressure, and the degree to which all of these encroach upon the personal life of the employee (Leiter, 2015). Heavy workloads deplete energy and prohibit recovery leading to an interruption of the necessary recovery cycle. When this overload occurs on a regular rather than just an occasional basis, it results in the exhaustion associated with burnout (Leiter and Maslach, 2003). In terms of the JD-R model this situation reflects an imbalance of demands over resources. In contrast, a manageable and sustainable workload leads to job engagement as there is time to develop skills, undergo training and professional development, and explore new work activities and opportunities (Leiter and Maslach, 2003). These skills and opportunities constitute work resources according to the JD-R model and therefore they can buffer workload demands.

Control in the workplace has to do with professional autonomy and the degree to which an employee feels they can influence work-related decisions (Leiter and Maslach, 2003). It includes constructs such as decision latitude, decision authority, autonomy, and skill discretion, and is considered a job resource in the JD-R model (Park et al., 2014). In addition, role conflict may reflect competing job demands within an organisation over which the employee feels they have no control, and this in turn may lead to stress and burnout. Role ambiguity is also associated with burnout and again, reflects a lack of control for the employee (Leiter and Maslach, 1999; Leiter, 2015). Studies have found a negative correlation

of job control with burnout (Adebayo and Ezeanya, 2011; Gavrilyuk et al., 2013) and demonstrated the buffering effect of job control on job demands (Schmidt and Diestel, 2011). A meta-analytic study, which included national culture as a moderator, found that job control had a significantly stronger relationship with DP and PA and that this relationship varied according to the power distance in a culture (Park et al., 2014). Countries with a low power distance, i.e., cultures where there is a preference for consultation between subordinates and those in authority and a low tolerance of paternalism or autocracy (Hofstede et al., 2010), had a stronger relationship between job control and the DP and PA dimensions of burnout than countries with high power distance (Park et al., 2014). This further highlights the possibility that culture impacts the relationship of various job demands and resources with burnout.

Reward is an important job resource and goes beyond financial reward to include social rewards, such as recognition and promotion, and personal rewards, such as fulfilment (Leiter and Maslach, 2003). In healthcare professions, meaningful patient interactions may also be considered rewards which may be negatively impacted by the excessive time pressures of work overload (Leiter, 2015). Thus, work overload is not only a job demand but may also function to reduce job resources, such as rewards. Rewards have been shown to predict all three dimensions of burnout and to be preventative of the DP/cynicism dimension (Jimenez and Dunkl, 2017). When rewards are considered to be inappropriate or unfairly distributed this will impact on the fairness domain, being perceived as unjust or inequitable (Leiter and Maslach, 2003). This underlines how each of these domains is intertwined with the others and does not operate in isolation. Other work characteristics that may also be perceived as unfair or unjust include inequity of workload, cheating, or inadequate complaints or grievances procedures (Leiter and Maslach, 2003). Fair treatment in the workplace includes respect which enhances self-worth and impacts on the sense of community that a workplace

fosters (Leiter and Maslach, 2003). Riolli and Savicki (2006) used procedural justice as an indicator of fairness and found that a lack of procedural justice is an important contributing factor to the development of burnout.

The domain of values refers to the motivations or ideals that drew employees to particular types of work (Leiter and Maslach, 2003). This is most obvious where jobs are 'vocational'.

Organisational values may reflect an individual's values (value congruence) and are inextricably linked with the perceived fairness of an organisation (Haines III et al., 2018).

When personal values are aligned with organisational values then engagement results. In contrast, a mismatch in values between an employee and the employing organisation can result in increasing work stress and eventually burnout (Leiter and Maslach, 2003). Haines III et al. (2018) investigated both organisational values and fairness, under the umbrella of 'systemic justice' and found that both are negatively correlated with burnout.

Finally, community is another important job resource and is a function of the nature and quality of social interactions in the workplace, including interactions with supervisors, colleagues, and clients or recipients (Leiter and Maslach, 2003). Appropriate support and feedback from supervisors, along with strong teamwork, is an important work resource, buffering work demands, and enhancing self-efficacy. In contrast, poor supervisory support, poor team communication, and conflict, may lead to feelings of inefficacy and increased work stress leading to burnout (Chami-Malaeb, 2021; Leiter and Maslach, 2003; Riley et al., 2021a; Riley et al., 2021b; Ruisoto et al., 2021; Velando-Soriano et al., 2020). The sense of community in a workplace can also be undermined by the constant re-structuring of teams and systems change, a common feature of many healthcare systems (Leiter, 2015).

3.3.2 Personal factors

Personal factors associated with burnout encompass resources such as personal coping strategies; Psychological Capacity (PsyCap) which is a measure of self-efficacy, optimism, hope, and resilience; specific personality traits such as the 'big five' personality traits; and empathy.

Coping strategies describe how an individual responds to a stressor (Welbourne et al., 2007) and thus, are important factors impacting the development of burnout. Although, coping strategies may be classified using different terminology, they can generally be assigned to one of either problem-focused or emotion-focused coping styles (Folkman and Lazarus, 1980; Lazarus and Folkman, 1984). Despite the different terminology used to categorise the different coping strategies, common threads emerge from the literature describing the relationship of coping strategies to burnout. Emotion-focused and avoidant coping styles are consistently associated with higher levels of EE, DP, and overall burnout, while in contrast, PA is associated with more problem-focused coping styles (Erschens et al., 2018; Hamid and Musa, 2017; Leiter, 1991; Portero de la Cruz et al., 2020; Shin et al., 2014; Wallace et al., 2010; Zhao and Ding, 2019). Several studies have found a specific association between burnout and the 'seeking social support' aspect of coping, with those more likely to employ this coping strategy, suffering lower levels of EE and overall burnout (Martínez et al., 2020; Shin et al., 2014; Zhao and Ding, 2019). This is consistent with the JD-R model where social support is considered to be a resource that provides a buffer against job demands. Zhao and Ding (2019) conclude that constructive coping styles, such as problem-focused coping, lead to a decrease in severity of all the dimensions of burnout. This is highly relevant for the development of interventions which could target coping strategies as one aspect of burnout reduction. However, constructive coping strategies are also influenced by social context and

culture (Sue and Sue, 2003, cited in Wallace et al., 2010), and this requires consideration when developing interventions cross-culturally.

PsyCap refers to the four elements of self-efficacy, optimism, hope and resilience, which represent an individual's positive psychological characteristics, distinct from personality traits (Luthans et al., 2007). While some studies have investigated the relationship of all four elements of PsyCap with burnout, finding that PsyCap positively influences both job satisfaction and an employee's perception of their organisation (Kotze, 2018), many focus on just one element such as self-efficacy or resilience. As mentioned previously, self-efficacy is the belief that one is capable of completing the tasks necessary to achieve certain outcomes or goals (Bandura, 1977) and therefore professional self-efficacy relates to perceived competence, or mastery, in the work domain (Cherniss, 1993). Self-efficacy is integral to several of the proposed theoretical frameworks for burnout which posit that it is protective (Cherniss, 1993; Pines, 1993). Findings from a large international study confirm that self-efficacy is negatively correlated with burnout consistent across nine different countries and cultures (Perrewé et al., 2002). This study also examined the relationship between the organisational factors of role ambiguity and role conflict, self-efficacy, and burnout. Role ambiguity was found to have a positive correlation with burnout in all countries except France where despite high levels of role ambiguity, burnout levels were found to be low. There was no consistent relationship found for role conflict with either self-efficacy or burnout. However, self-efficacy was found to either partially or fully mediate the relationship between role ambiguity or role conflict, and burnout in eight out of the nine countries. In terms of the JD-R model this provides evidence of the buffering impact of personal resources on job demands. Other studies have confirmed this negative relationship between self-efficacy and burnout with longitudinal studies confirming self-efficacy as a protective

personal resource, finding that low self-efficacy precedes burnout (Aftab et al., 2012; Cansoy et al., 2017; Schwarzer and Hallum, 2008; Shoji et al., 2016; Yao et al., 2018).

Resilience is another aspect of PsyCap which is associated with vulnerability to burnout. However, resilience is not a simple psychological construct but complex and multifactorial and thought to be influenced by other personal factors such as coping strategies and personality traits (McKinley et al., 2020). In essence, resilience describes a person's ability to recover from the impact of stressful events (McKinley et al., 2020) and, like self-efficacy, it would be considered a resource in the JD-R framework. Resilience is negatively correlated with the EE and DP dimensions of burnout as well as with overall burnout, and positively correlated with PA (Di Monte et al., 2020; García and Gambarte, 2019; Kutluturkan et al., 2016; West et al., 2020; Zou et al., 2016). However, West and colleagues (2020) found that burnout was common in physicians even when resilience scores were high. Qualitative studies have found that self-care and strong social connections and support networks are key aspects of resilience (Wagner and Pather, 2019; Winkel et al., 2018), as well as having a 'sense of purpose' (Wagner and Pather, 2019). Thus, social support is central, both in developing resilience, and as part of an effective coping strategy. This provides insight into the possible mechanisms by which social support acts as a resource to buffer the demands of work and reduce the risk of burnout. The finding that a 'sense of purpose' is also key to resilience is interesting as it links back to Pines' (1993) theory that the failure to find meaning in one's work is a key element in the aetiology of burnout.

Personality traits are also considered as important in determining an individual's vulnerability to burnout and several studies have explored the relationship between burnout and the five main personality traits: neuroticism, extraversion, conscientiousness, agreeableness, and openness to experience (McCrae and Costa, 1989). There is general agreement that

neuroticism is positively associated with both EE and DP, and negatively associated with PA, while the converse is true of conscientiousness, extraversion, and agreeableness (Alarcon et al., 2009; Azeem, 2013; Bakker et al., 2006; Bhowmick and Mulla, 2021; Brown et al., 2019; Kim et al., 2019; Langelaan et al., 2006). Bakker et al. (2006) suggest that neuroticism and extraversion are the personality traits that most consistently predict burnout, however, other studies have found no significant relationship between extraversion and burnout (Bhowmick and Mulla, 2021; Brown et al., 2019). Langelaan et al. (2006) found that burnout was primarily related to neuroticism and suggest that neuroticism might be viewed as a 'vulnerability factor'. A meta-analysis of the effect of these five personality traits on burnout in teachers found small but significant effect sizes for all five traits (Liu et al., 2022). This evidence suggests that personality traits are an important factor in the development of burnout.

Empathy has also been investigated as a protective personal resource. Wilkinson and colleagues (2017) found that eight out of the ten studies in their systematic review provided evidence to support a negative relationship between empathy and burnout i.e., low empathy is associated with high burnout. One study found the reverse relationship with high empathy being associated with both high DP and high EE, and the final study also found that higher empathy was associated with higher EE however, their sample size was small with only 25 participants. Although, this review found stronger evidence for an association between low levels of empathy and high burnout, research findings are not conclusive. It remains possible that while high levels of empathy may protect against burnout, the development of burnout may lead to reduced levels of empathy. Zenasni et al. (2012) discuss these, together with a third possibility, that high levels of empathy actually create burnout, as they may lead to compassion fatigue. They go on to suggest that different empathic approaches may yield different results. A qualitative study affirms these three possible relationships of empathy to

burnout. General medicine residents in France were interviewed about the relationship of empathy to burnout and while 87.5% agreed that burnout had a negative impact on empathy, 50% suggested that too much empathy could lead to compassion fatigue and thence to burnout. Additionally, two thirds of the residents felt that empathy could protect against burnout (Picard et al., 2016). Longitudinal studies are necessary to further explore these relationships.

3.3.3 Demographic factors

There is some evidence for the association of certain demographic factors such as gender, age, and marital status with burnout, however, routes to burnout are many and varied and this may result in inconsistencies in the direction of these associations across the literature. For example, the association of gender with burnout is not clear with some studies finding that women are at higher risk than men, and others finding to the contrary (Abraham et al., 2020). However, the possible reasons for this are complex, and include cultural gender roles, differences in work-family conflict, workplace inequalities, including expectations and opportunities, and gendered personal resources (Beauregard et al., 2018). In addition, results from a meta-analysis suggest that men and women may experience burnout differently with higher rates of EE in women, and higher rates of DP in men (Purvanova and Muros, 2010). Therefore, if a unidimensional burnout measurement tool is used that focuses only on exhaustion, this may result in higher burnout scores for women, exaggerating gender differences (Purvanova and Muros, 2010).

Likewise, the association with age is inconsistent and again the reasons may be complex. While younger age groups and early career workers may be at higher risk of burnout due to greater work-family conflict and inexperience leading to feelings of inefficacy (Cherniss,

1993; Dyrbye et al., 2013), older age groups may burn out as a result of increasing work responsibilities, changes in family caring responsibilities and frustrated career development, along with the physiological impacts of ageing (Marchand et al., 2018). Furthermore, survival bias may contribute to an overestimation of the association of younger ages with burnout as those who burn out at a young age may then change career leaving behind those less affected by burnout (Maslach et al., 2001). A meta-analysis of sociodemographic factors associated with burnout in police officers found higher levels of DP in younger officers (Aguayo et al., 2017). Similarly, a meta-analysis of studies in nurses found higher levels of both EE and DP in younger age groups (De la Fuente-Solana et al., 2019). However, evidence from a systematic review of European healthcare professionals found that while in half of the studies younger age was associated with increased DP, in the other half age was not significantly associated with burnout (Bria et al., 2012). Other studies suggest that the risk of burnout increases with increasing age (Amiri et al., 2016; Bijari and Abassi, 2016; Stanetic and Tesanovic, 2013) while still others suggest that the association of burnout with age may be bimodal with a peak in the <25 age group and then again in the >55 age group (Chemali et al., 2019; Marchand et al., 2018).

Marital status and children have also been investigated as possible demographic factors associated with burnout and here again the evidence is inconsistent. Some meta-analyses suggest that being single or divorced, without children is associated with higher levels of burnout (Cañadas-De la Fuente et al., 2018) or that those who are single report increased EE and DP and those who are married report decreased PA (Kış, 2014). This latter finding is contested by Aguayo et al. (2017) who found that being married or in a relationship resulted in increased EE but also increased PA. They elaborate on this finding by suggesting that being in a relationship protects men from burnout, but that the same relationship may constitute a risk factor for women due to the risk of increased work-family conflict for the women. Others

find that the risk of burnout is increased for those who are married with children (Membrive-Jiménez et al., 2020).

In view of these conflicting results across the sociodemographic factors of gender, age, marital status, and children/dependents, it is likely that sociodemographic factors are much less significant in the development of burnout than organisational and personal factors. Nevertheless, an association with sociodemographic factors cannot be excluded. It may be that the direction of association of specific sociodemographic factors is contingent on specific cultural and organisational factors, and this should be explored. Our study questionnaire will collect data on a wide variety of associated organisational factors as well as sociodemographic factors, so that their relationship with burnout can be investigated.

3.4 Measurement tools

A valid differential diagnostic tool for the clinical diagnosis of burnout does not exist (Korczak et al., 2010), rather the measurement of burnout relies on various Patient Reported Outcome Measures (PROMs). These tools have been developed as research tools rather than clinical diagnostic tools. This next section will provide descriptions of the most commonly used burnout measurement tools followed by a brief discussion of the issues surrounding their cross-cultural use. The dominant measurement tool in the burnout literature is the MBI (Rotenstein et al., 2018; Schaufeli and Enzmann, 1998) which will be discussed first, followed by the OLBI, which was the tool chosen for this research, and finishing with a summary of some of the other measurement tools that are available.

3.4.1 The Maslach Burnout Inventory

Maslach's early exploratory research resulted in the derivation of a multi-dimensional definition of burnout comprising the three dimensions of EE, DP, and reduced PA (Maslach, 1982, 1998), and Maslach and Jackson developed a scale to measure these dimensions, the MBI (Maslach and Jackson, 1981). The MBI was initially developed for use only in human service industries but subsequent research, confirming the existence of the burnout phenomenon across a wide range of different occupations, has resulted in the development of several different versions of the MBI for use in different occupational fields (Mindgarden, 2022). These include the most commonly used one for human services workers (HSS), one for general use (GS), one for educators (ES), and one for students. Differences between these different versions are relatively minor. The GS version has 16 questions and uses the word 'cynicism' in place of 'depersonalisation', referring to the user's attitude towards their job rather than their attitude towards patients or recipients. The general use version for students replaces the word 'job' with 'studies'. The human services, medical personnel, and educators' versions all contain 22 questions and use wording specific to occupation e.g., patient, recipient, or student (Mindgarden, 2022).

The MBI is the most widely used tool investigating burnout in LMICs as well as HICs and has been translated into 47 different languages (Mindgarden, 2022). However, the official website for the MBI issues a caveat that they cannot guarantee the quality of each translation as individual researchers have completed many of them and therefore, validity data is lacking (Mindgarden, 2022). Use of the MBI also requires payment of a licence fee (Mindgarden, 2022), and this additional cost may be a significant factor in the choice of measurement tool, particularly for research in LMICs.

The MBI-HSS is a twenty-two-item measurement tool consisting of the three subscales of 1) emotional exhaustion (EE), 2) depersonalisation (DP), and 3) personal accomplishment (PA)

(Maslach et al., 1996). The questions are formulated as statements about feelings or attitudes and the response is in terms of how frequently these feelings or attitudes are experienced. Scores are generated for each subscale and level of burnout assessed as either low, moderate, or high according to particular cut-off points (Maslach et al., 1996). The MBI manual recommends that researchers do not combine scores across subscales for an overall score (Maslach et al., 1996), and therefore, rather than combining scores for an overall total, some researchers define overall burnout according to the number of subscales a person scores highly on (Grunfeld et al., 2000; Kotb et al., 2014; Ramirez et al., 1996).

Although not recommended by the authors of the MBI, subscale scores are, occasionally, combined in one of two ways. The first is to simply sum the scores in each subscale with increasing scores implying increasing levels of burnout. One such study that combined the scores in this way defined a low level of burnout as an overall score between 1 and 33, a moderate level of burnout as an overall score between 34 and 66, and a high level of burnout as an overall score between 67 and 99 (Al Dabbagh et al., 2019). In addition, researchers in Finland have developed a formula for use with the MBI, attempting to form a syndrome indicator for burnout (Kalimo et al., 2003). Kalimo et al. (2003) argue that the factors associated with burnout appear to relate differently to the different dimensions of burnout, thus leading to ambiguity around the causes of burnout. The conceptualisation of burnout as multidimensional means that no single dimension is representative of burnout, equally, none are specific to burnout. Hence, they argue that the different dimensions should be studied at syndrome level, requiring the development of a syndrome indicator. As the importance of each dimension varies within the syndrome, with exhaustion being dominant, it is not sufficient to simply sum the separate subscale scores. Therefore, they developed a weighted syndrome indicator based on a large, representative sample of Finnish workers. Coefficients were formed for each dimension, correlating to the importance of the

dimension within the syndrome and allowing the generation of a single burnout score. The formula is as follows:

$$\text{Burnout} = 0.4 \times \text{EE score} + 0.3 \times \text{DP score} + 0.3 \times \text{reduced PA score}$$

In this method a low level of burnout scores 0-1.49; a moderate level 1.5-3.49 and a high level 3.5 -6.0 (Kalimo et al., 2003). This is not a widely used method of combining the subscale scores for the MBI.

Although the MBI is currently the dominant measurement tool for burnout, there is ongoing debate surrounding both the multi-dimensional definition underpinning it, and its psychometric properties, as all the questions are framed in the same direction (Demerouti et al., 2010; Demerouti and Bakker, 2008; Lee and Ashforth, 1996; Schaufeli and Taris, 2005).

What this means in terms of framing is that items in the EE and DP subscales are all worded negatively, while the items in the PA subscale are all worded positively. This can introduce a wording bias thus negatively impacting the internal validity of the tool, which is a measure of how accurately a tool measures the construct it is designed to measure (Halbesleben and Demerouti, 2005; Lee and Ashforth, 1990; Shoman et al., 2021). A recent systematic review of the psychometric properties of burnout measurement tools found that although the MBI had the highest number of validation studies, the quality of the validity evidence was very low for six out of eight psychometric properties (Shoman et al., 2021).

Additionally, the MBI measures three different dimensions of burnout: EE, DP, and reduced PA. While there is good correlation between the first two dimensions, the third dimension, reduced PA, has been shown to correlate poorly with the other two (Lee and Ashforth, 1996), raising the possibility that burnout is better conceptualised either as the two dimensions of exhaustion, and disengagement (Schaufeli and Taris, 2005) or as a single exhaustion dimension (Kristensen et al., 2005). It is this debate around the conceptualisation of burnout that has led more recently to the development of other measurement tools

including the OLBI in Germany which focuses on the two core components of exhaustion and disengagement (Demerouti and Bakker, 2008), and the CBI in Denmark which focuses on the single exhaustion dimension, dividing it into the components of emotional, physical, and cognitive exhaustion (Kristensen et al., 2005).

3.4.2 The Oldenburg Burnout Inventory

The OLBI was developed for use in any occupation and contains 16 questions. It overcomes both the psychometric and conceptual shortcomings of the MBI by including both positively and negatively framed items and by using a two-dimensional framework, measuring exhaustion and disengagement, rather than the three dimensions of the MBI (Demerouti et al., 2001). This two-dimensional conceptualisation of burnout is based on the JD-R model for the aetiology of burnout, and therefore, the OLBI is the only measurement tool underpinned by a theoretical framework (Demerouti et al., 2001). In addition, the OLBI broadens the exhaustion component of burnout beyond emotional exhaustion to include both cognitive and physical exhaustion (Demerouti et al., 2010). This is particularly pertinent in LMICs where rural healthcare workers, including FPs, may have to travel considerable distances to get to rural clinics, or to visit community patients, resulting in physical exhaustion (Selamu et al., 2017). Scores from the exhaustion and disengagement subscales may be combined to generate an overall score, or mean item scores can be calculated (Peterson et al., 2008a, 2008b; Summers et al., 2020).

Use of the OLBI is becoming more prominent with some evidence to suggest that it is the second most widely used measurement tool (Guseva Canu et al., 2021; Shoman et al., 2021). It has been tested as both a reliable and valid alternative to the MBI (Halbesleben and Demerouti, 2005; Shoman et al., 2021). In fact, Shoman et al. (2021) found it to be the

second most valid PROM, with the highest number of psychometric properties assessed. The most valid PROM was found to be the CBI; however, this result was based on just one, albeit very comprehensive, study (Shoman et al., 2021). Although the OLBI was developed in Germany, it has been translated into several other languages including a validated English version (Halbesleben and Demerouti, 2005). Use of the OLBI in LMICs is increasing with studies from Sri Lanka (Subburaj and Vijayadurai, 2016), Malaysia (Mahadi et al., 2018), and Brazil (Sinval et al., 2019), translating and validating it for local use. Studies in other LMICs have used the validated English version, such as studies in Pakistan (Khan and Yusoff, 2016), India (Srikrishna et al., 2020), the Philippines (Ancheta et al., 2021), Cameroon (Njim et al., 2018), Nigeria (Nwosu et al., 2020), and South Africa (Demerouti et al., 2010). The OLBI was the burnout measurement tool chosen for use in this study (see section 3.4.6 for more detail).

3.4.3 The Copenhagen Burnout Inventory

The CBI may be used for any occupation and consists of 19 questions and three subscales measuring personal, work-related, and client-related burnout, respectively (Kristensen et al., 2005). Three facets of exhaustion are measured – emotional, physical, and cognitive exhaustion. Shoman et al. (2021) found that the CBI was the most valid PROM for occupational burnout however, this validity evidence is based on only one, very comprehensive study and they suggest that further studies are done, especially regarding cross-cultural validity.

Researchers developed the CBI in response to the need for an appropriate tool to measure burnout in a 5-year longitudinal study (PUMA) conducted in Denmark (Kristensen et al., 2005). They concluded that the MBI was unsatisfactory for the following reasons. The MBI is

based on a definition that restricts burnout to workers in human services occupations and, although alternative forms of the MBI have been developed to enable its use in other occupational groups, the original definition has not been modified. In addition, the relationship between the underlying burnout concept and the MBI subscales is unclear. While the definition implies the concurrent occurrence of the three dimensions of burnout, the MBI measures these three dimensions separately and the authors recommend the separate analysis of subscale scores (Maslach et al., 1996). Moreover, factor analysis confirms that these three subscales measure distinct and different dimensions. This results in a single concept of burnout but three distinct measures, raising the possibility that one individual may have three different levels of burnout depending on their different subscale scores. Furthermore, studies have suggested that the dimension of PA develops independently of the other two dimensions and may be an outcome of burnout (Schutte et al., 2000), whereas DP is often described as a coping strategy (Kristensen et al., 2005). Thus, Maslach's three-dimensional definition of burnout may in fact be comprised of an individual state, a coping strategy, and an outcome, and Kristensen et al. (2005) argue that researchers should study these components separately, in their own right, rather than combining them. Finally, two further issues, the cross-cultural inappropriateness of several of the questions on the MBI for the Danish culture, and the fact that the MBI is not freely available in the public domain but requires payment of a licence fee, led Kristensen and colleagues to develop the CBI.

3.4.4 The Burnout Measure

The Tedium Measure (TM) (Pines et al., 1981), later re-named as the Burnout Measure (BM), was developed during the early stages of burnout research, and focuses on exhaustion as

the core component of burnout. It is a twenty-one-item instrument evaluated using a 7-point Likert frequency scale that measures physical, mental, and emotional exhaustion. Moreover, it is suitable for use across different occupations (Malach-Pines, 2005) and shows moderate but significant correlation with scores generated by the MBI as well as with measures of job satisfaction and health (Stout and Williams, 1983). A short version of this tool has also been validated containing only ten items. A mean item score of 4 or above defines burnout using this instrument (Malach-Pines, 2005). Shoman and colleagues found that the evidence for content validity of the BM was inadequate and that there was a very low quality of evidence for psychometric validity (Shoman et al., 2021).

3.4.5 Other measurement tools

There are a wide variety of other instruments used to measure burnout. These include the Spanish Burnout Inventory (CESQT), the Professional Quality of Life Scale (ProQOL), the Compassion Fatigue Questionnaire (CFQ) and various modified scales based on the MBI, or single-item scales. Unlike the MBI, these alternative measurement tools all have the advantage of being freely available. The CESQT is used widely in Spanish speaking countries and has four subscales, three of which are similar to the MBI subscales: the first subscale is a lack of enthusiasm for work; the second 'psychic wear' or emotional exhaustion; the third apathy and cynicism towards work; and the fourth is the presence of guilt (Gil-Monte and Faúndez, 2011). Scoring for the CESQT generates two different profiles. 'Profile 1' is the presence of high scores in the first three subscales but without guilt, whereas 'Profile 2' includes the presence of guilt (Gil-Monte and Faúndez, 2011). The ProQOL and the CFQ are related measurement tools. The CFQ is simply an older version of the ProQOL (ProQOL, 2021). The ProQOL measures compassion satisfaction, compassion fatigue and burnout with

scores for each subscale categorised as low, moderate, or high and is available in twenty-six different languages (ProQOL, 2021).

Other measurement tools include a short burnout questionnaire (Moreno-Jiménez et al., 1997), and a validated single item tool (Dolan et al., 2015; Helfrich et al., 2014). The short burnout questionnaire (Moreno-Jiménez et al., 1997) was developed to enable evaluation of burnout as a process and is comprised of three categories: antecedents of burnout; elements of burnout; and consequences of burnout. Mean scores are calculated for each category with higher scores indicating the level of burnout. Questions for the category measuring elements of burnout are based on the MBI. The single-item scale invites users simply to rate how burned out they feel by choosing the best description from a five-item scale where a choice of 3, 4 or 5 on the scale is categorised as burnout (Dolan et al., 2015; Kruse et al., 2009). This single-item scale has been validated against the single-item MBI exhaustion scale (MBI:EE) as well as a three-item MBI:EE scale (Dolan et al., 2015; Helfrich et al., 2014) and offers a viable and easily interpreted alternative to the MBI:EE scale for screening of burnout (Hansen and Girgis, 2010).

The most recently developed tool for the measurement of burnout is the Burnout Assessment Tool (BAT), developed by Schaufeli and colleagues in response to the ongoing debate around the psychometric shortcomings of the MBI and the need for a burnout measurement tool that produces a single overall burnout score (Schaufeli et al., 2020). It is comprised of 33 questions, divided into two subscales, BAT-C and BAT-S. BAT-C contains 23 items and the four core dimensions of exhaustion, mental distance, impaired emotional control, and impaired cognitive control. BAT-S consists of 10 questions and the two dimensions of psychological and psychosomatic complaints (Schaufeli et al., 2020). Initial testing confirms this questionnaire's reliability, and factorial and construct validity

(Hadžibajramović et al., 2020; Schaufeli et al., 2020), and the unidimensionality of the four core dimensions (BAT-C), allowing for the combination of subscale scores into a single composite burnout score (Hadžibajramović et al., 2020). Although this measurement tool shows promise, more testing needs to be done to confirm reliability and validity across different populations.

3.4.6 Choice of burnout measurement tool

In view of the following facts: that the OLBI overcomes both the psychometric and conceptual shortcomings of the MBI; that it is underpinned by a theoretical framework; that it is freely available; and that the English version has been validated and used cross-culturally; the OLBI was chosen as the measurement tool for this study. Additionally, it is a shorter questionnaire than the MBI (16 rather than 22 questions), which may have a small, positive impact on response rates as shorter questionnaires have been shown to be associated with increased response rates (Edwards et al., 2009).

3.4.7 Cross-cultural use of measurement tools

Cross-cultural differences, both in language and in cultural norms and values add a layer of complexity to the use of measurement tools cross-culturally. Squires et al. (2014, p.66) suggest that “...the linguistic expression of burnout has a cultural component...”, i.e. employees in other cultures may experience the symptoms of burnout yet not have the words in their language to describe their experience. In addition, the cultural norms and values of a society may not favour the admission of being ‘burnt out’ and this may result in a reluctance to express burnout symptoms or differences in the meaning attributed to those symptoms (Squires et al., 2014).

Accordingly, although many burnout tools are simply translated by researchers for cross-cultural use, there must be an awareness that the theoretical structure of the construct being measured, as well as the factorial structure of the measurement tool, may not be equivalent across cultural groups (Byrne and Campbell, 1999). This is especially important when a measurement tool, developed in one country, is simply translated for cross-cultural use in another country. Although the translation may be accurate in itself, it may not adequately convey the meaning of the constructs being measured raising the possibility that the resulting tool is not equivalent psychometrically, or conceptually, to the original (Byrne and Campbell, 1999). For example, certain languages may not have an equivalent word for the English word 'distress', and therefore a translator must try to convey the meaning using another word or phrase. While the translation may be semantically adequate, it may not adequately convey the meaning of the word 'distress' (He and van de Vijver, 2012).

Construct bias is another problem for cross-cultural research, particularly when making comparisons between cultural groups, and exists when the construct being measured differs, either in definition, or related behaviours, across cultures (He and van de Vijver, 2012). An example of this is the construct of filial piety which in most cultures involves concepts such as respect and care, but is a much broader concept in Chinese culture, encompassing obedience and a much greater level of responsibility (Dai and Dimond, 1998, cited in He and van de Vijver, 2012). These potential differences in construct must be considered when conducting cross-cultural comparisons. Differences in item factor loadings or highly variable skewness and kurtosis in item scores between cultural groups may indicate a lack of equivalence of a measurement tool across cultural groups (Byrne and Campbell, 1999) and this will be investigated as part of the statistical analysis of the questionnaire results in our research.

3.4.8 Summary

In summary, a large number of tools have been developed for the measurement of burnout, many of which have been translated for cross-cultural use. However, this lack of a single standardised measurement tool raises challenges for burnout researchers, not only in determining which tool to use, but also for making comparisons across studies and for aggregating and interpreting burnout data. The solution lies in achieving an international consensus on both the definition and the measurement of burnout.

3.5 Consequences of burnout

Burnout in physicians has consequences both for the individual and for wider society. Individual consequences can be categorised as either physical, social, or psychological, while the consequences for wider society include consequences for the organisation or health system, consequences for patient care, and wider economic consequences. This next section will explore these consequences in more detail.

3.5.1 Physical consequences

3.5.1.1 Burnout and physical health

There is a substantial body of evidence associating burnout with ill health, especially cardiovascular disease (CVD). A Finnish study examining the association between burnout and physical illness, in a sample from the general population, found that physical illness was more prevalent in those with higher burnout scores, particularly those with high scores for EE or cynicism. Furthermore, in men, the association between burnout and CVD persisted

after adjustment (Honkonen et al., 2006). Melamed et al. (2006a) also found an association between burnout and an increased risk of CVD, calculating that the relative risk for burnout is similar to that of the more classical cardiovascular risk factors and postulating that burnout leads to hypothalamic-pituitary-adrenal (HPA) axis dysregulation and an increase in inflammatory markers. Several other studies support this association between burnout and CVD (Appels and Schouten, 1991; Toker et al., 2012; Toppinen-Tanner et al., 2009), as well as the proposed mechanism of HPA axis dysregulation (de Vente et al., 2015). Moreover, burnout is also associated with other cardiovascular risk factors such as hyperlipidaemia (Shirom et al., 1997), obesity (Kitaoka-Higashiguchi et al., 2009), and an increased risk of developing type 2 diabetes (Melamed et al., 2006b), adding to the potential cardiovascular impact. However, Armon and colleagues (2008) failed to show any significant association between burnout and obesity and although an association between burnout and HBP has been suggested (von Känel et al., 2020), findings from several studies have not supported this (Alves et al., 2009; Kitaoka-Higashiguchi et al., 2009; Nascimento et al., 2019). Thus, the evidence for an association between burnout and specific cardiovascular risk factors is far from definitive, and more work needs to be done to establish causality and the underlying mechanisms.

Honkonen et al. (2006) also found a significant association between burnout and an increased risk of musculoskeletal disorders in women. This finding is supported by other studies which found a higher prevalence of general pain, and regional musculoskeletal pain in the neck, shoulders, or lower back, in groups with high burnout scores (Armon et al., 2010; Grossi et al., 2009; Melamed, 2009; Peterson et al., 2008b; Pruessner et al., 1999). Moreover, burnout is correlated with an increased risk of common infections such as colds, flu-like illnesses, and gastroenteritis (Kahill, 1988; Mohren et al., 2003). Longitudinal results support a causal link between burnout and infection (Mohren et al., 2003) raising the possibility that

burnout may lead to a degree of immunosuppression mediated by increased cortisol levels resulting from an exaggerated HPA axis response to stress (Melamed et al., 2006a, 1999; O'Connor et al., 2000). Furthermore, burnout is a predictor of medically certified work absence for a variety of diagnoses, including respiratory, cardiovascular, and musculoskeletal disorders (Toppinen-Tanner et al., 2005).

3.5.1.2 Possible mechanisms for the physical consequences of burnout

Dysregulation of the HPA axis has been proposed as a possible mechanism for some of the physical consequences of burnout and a small number of studies have investigated this (Rothe et al., 2020). Overall, findings are not consistent, with some studies suggesting that burnout results in hypercortisolism (Melamed et al., 1999; Penz et al., 2018), some that burnout results in hypocortisolism (Jönsson et al., 2015; Lennartsson et al., 2015; Marchand et al., 2014), and some finding no difference between burnout patients and healthy controls (Mommersteeg et al., 2006; Österberg et al., 2009). However, Miller et al.'s (2007) observations, that hypercortisolism and increased reactivity of the HPA axis is seen at the onset of stress, but as stress becomes more chronic, the HPA axis becomes less reactive, resulting in hypocortisolism and reduced diurnal variation, may help to explain this. As burnout is a process, those in the early stages of burnout may show hyperactivation of the HPA axis, whereas those with more severe burnout may show hypoactivation of the HPA axis and hypocortisolism (Rohleder, 2018). In a recent study, Fernandez-Sanchez et al. (2018) found that cortisol release was higher in the cohort of patients who scored highly in only one dimension of burnout, as compared to controls, whereas those with more severe burnout (high scores in two or three dimensions) had cortisol release levels similar to the control cohort. They suggest that those with more severe burnout should have hypercortisolism in

response to higher levels of stress and that in fact, the normal values are an indication of HPA axis hypoactivity. This is in line with Miller et al.'s (2007) suggestion that initial HPA axis hyperactivity in early burnout progresses to hypoactivity as burnout becomes more severe. In addition, studies have investigated possible endocrine or immunological mechanisms, along with the balance of sympathetic and parasympathetic activity (de Vente et al., 2015; Jonsdottir and Dahlman, 2019). De Vente and colleagues (2015) found that burnout was associated with an increased basal systolic blood pressure and decreased heart rate variability which supports the predominance of the sympathetic system in burnout. Interestingly, the increased systolic blood pressure was only significant in males, and they conclude that the physiological profile resulting from exposure to work-related stress is more adverse in males than in females. A systematic review of studies investigating biomarkers in burnout, such as C-reactive protein, prolactin, natural killer cells, dehydroepiandrosterone sulphate, and cortisol, failed to find a convincing relationship between burnout and any biomarkers (Danhof-Pont et al., 2011). However, they suggest several reasons for this including small numbers of studies, differences in the way the biomarkers were assessed, and differences in defining and operationalising burnout (Danhof-Pont et al., 2011). Therefore, while current evidence suggests that there are no reliable biomarkers of burnout, and results from investigations of the HPA axis in burnout are conflicting, there is a need for more high-quality research in this area.

3.5.2 Psychological consequences

Given the relationship of burnout to stress it is likely that burnout will have consequences for mental health and indeed, studies have demonstrated that burnout is associated with an increased risk of mental ill-health. A Brazilian study found that the three dimensions of

burnout are independently associated with an increased risk of common mental disorders (Silva and Menezes, 2008). Furthermore, longitudinal studies have found that work overload at time 1 predicts burnout at time 2 which, in turn, predicts psychological ill-health at time 3 (de Beer et al., 2016) and that burnout is significantly related to an increased risk of hospital admission with a mental disorder (Toppinen-Tanner et al., 2009). Burnout is also a predictor of insomnia and sleep disorders, and of depression (for a review see Salvagioni et al., 2017) and is associated with a higher prevalence of anxiety (Peterson et al., 2008b). Moreover, burnout has a significant correlation with risky alcohol consumption and alcohol dependence, a consequence that may be a function of an avoidant or emotion-focused coping style (Ahola et al., 2006; Pedersen et al., 2016). More generally, Mohren et al. (2003) found that their clinical burnout cohort had a 20-fold higher percentage of non-somatic illness at baseline than their healthy cohort.

Suicide is an important and tragic potential outcome of mental ill-health and while much of the literature focuses on the association of depression with suicide rather than burnout with suicide, the possibility that burnout increases a person's risk of suicide cannot be ignored. A study by Dyrbye et al. (2008) looked at burnout and suicidal ideation in US medical students and measured both depression and burnout to enable correction to be made for the association of depression with both suicidal ideation and burnout. They found that students with burnout were 2-3 times more likely to also report suicidal ideation, independent of their depression score. Other studies have also found an association of burnout with suicide risk although depression is a potential confounder in those studies that do not also measure depressive symptoms (Lheureux et al., 2016; Pompili et al., 2006, 2010). More recently a systematic review by Williams et al. (2020), conceptualising burnout as a loss spiral of reduced activity, progressing to distress, and culminating in despair, found evidence for an association of severe burnout with suicidal ideation. Also highlighted in this systematic

review is the dearth of longitudinal studies investigating the association of burnout with both physical and mental ill-health (Williams et al., 2020).

3.5.3 Social consequences

Intense interpersonal relationships are theoretically central to the development of burnout, and as a result, professions such as healthcare, where intense interpersonal relationships between a caregiver and a recipient define the job, are considered to be high risk for burnout (Schaufeli et al., 1993). As interpersonal relationships impact the development of burnout, so the resulting EE and cynicism of burnout in turn impact interpersonal relationships, not only for recipients of care, but also for colleagues and relationships outside of work (Maslach et al., 2001).

Both the EE and the cynicism, or DP, dimensions of burnout may lead to a desire to withdraw from work, or from recipients/clients. This distancing and withdrawal from clients can spill over into other relationships, such as relationships with colleagues, and those outside of work, such as friends and family. The social consequences of this include isolation and a loss of social support networks, with fewer friends, and less involvement with family, or a deterioration of family relationships (Jackson and Maslach, 1982; Suñer-Soler et al., 2014). Spouses of workers with burnout describe increased emotional distress for themselves and other family members, as a result of their partner's burnout (Zedeck et al., 1988) and burnout positively correlates with partner burnout (Bakker, 2009). Burnout may also lead to greater conflict at work which has a negative impact on colleagues and this, in turn, can be 'contagious', increasing the risk of burnout for other colleagues and forming a 'vicious cycle' where burnout leads to interpersonal conflict which in turn leads to more burnout (Maslach et al., 2001).

3.5.4 Quality of care

The presence of EE and DP may affect work performance and in the case of healthcare providers this may impact quality of care and even patient safety. Additionally, as the third dimension of burnout, according to Maslach and Jackson (1981), is a dissatisfaction with performance, practitioners suffering from burnout may also perceive themselves to be providing a reduced quality of care. Indeed, there is evidence of a statistically significant relationship between burnout and physician quality of care, both perceived quality of care and actual outcomes including recovery times (Dewa et al., 2017; Halbesleben and Rathert, 2008; Hall et al., 2019; Hodkinson et al., 2022; Tawfik et al., 2019; Welp et al., 2015). This relationship is most significant with the dimension of EE, although it is still significant with the dimensions of DP and reduced PA (Salyers et al., 2016), and there is evidence of higher levels of EE correlating with higher standardized mortality ratios (Welp et al., 2015). Furthermore, Hodkinson et al. (2023), focusing on prescribing rates for strong opioids and antibiotics, found that high levels of EE and DP may impact the quality of patient care by leading to inappropriate prescribing.

In addition, a longitudinal study found that physicians with high burnout scores reported more errors and, conversely, that reported errors were associated with subsequent increases in burnout scores across all domains (West et al., 2006). However, many quality-of-care studies rely on self-report and a study by Fahrenkopf et al. (2008) found that while physicians with higher burnout scores reported significantly more errors than colleagues with lower scores, this was not confirmed by objective medical record data which showed no significant difference in error rate between the two groups. Rabatin et al. (2016) also failed to find a significant association between burnout and a reduced standard of care or increased errors

when audited objectively and suggests that the preservation of clinical standards in burnout comes at a significant personal cost to the physician. In conclusion, while there is moderate evidence to suggest an association between burnout and quality of care (Dewa et al., 2017), the tendency for physicians with higher scores to report more errors may introduce bias to those studies that rely on self-report, and there is some evidence to suggest that quality of care may be preserved in physician burnout.

3.5.5 Organisational consequences

The increased risk of physical and psychological ill-health may also have consequences for the employing organisation or health service such as increases in sick leave, absenteeism, presenteeism, and staff turnover. This is borne out in the literature with Mohren et al. (2003) finding that more than ten times as many workers from their clinical burnout group were on sick leave at the start of their study compared to the healthy worker group, and Peterson et al. (2008a) finding a positive association between burnout and sickness absence. In addition, several prospective studies have found that burnout is a predictor of both short and long-term sickness absence (Anagnostopoulos and Niakas, 2010; Borritz et al., 2010; Firth and Britton, 1989; Roelen et al., 2015; Toppinen-Tanner et al., 2005; Ybema et al., 2010). These studies all collected sickness absence data from formal sickness registers, rather than relying on self-reported absence data. In contrast, a study by Dyrbye et al. (2019) on nursing staff, found that although burnout correlated with absences of one or more days during the previous month, the relationship was not statistically significant. Similarly, Olivares-Faúndez et al. (2014) demonstrated a relationship between psychological exhaustion and absenteeism but found no significant association of overall burnout with absenteeism. However, these two studies were retrospective and relied on self-report absence data which

may be influenced by recall bias. Therefore, despite some conflicting results the evidence supports a predictive relationship of burnout with work absences. This is important for organisations in terms of workforce planning. In a similar way, presenteeism, defined as attending work when unwell and not fit for work (Lohaus and Habermann, 2019), is an important factor affecting organisational productivity and several studies confirm an association of burnout with presenteeism (Demerouti et al., 2009; McGregor et al., 2016; Pei et al., 2020).

Studies also show that burnout correlates both with intention to leave, often used as a proxy for turnover, and actual turnover (Firth and Britton, 1989; Goodman and Boss, 2002; Hodgkinson et al., 2022; Rabatin et al., 2016; Van der Heijden et al., 2019; Willard-Grace et al., 2019). A large cross-sectional study on physicians in China found that intention to leave correlated significantly and positively with each of the burnout subscales, most strongly with the EE subscale, and least, though still significant, with the PA subscale (Zhang and Feng, 2011). Additionally, a more recent study on primary care providers in China confirms this relationship between burnout and turnover intention, finding that burnout exerts a significant and direct effect on turnover intention and mediates an indirect effect of job satisfaction on turnover intention (Wang et al., 2020). Furthermore, a study in the United States found a significant correlation between burnout and intention to leave and demonstrated that intention to leave strongly predicted actual turnover (Hamidi et al., 2018). Of the separate burnout dimensions EE and DP respectively, appear to correlate most strongly with turnover intentions (Ducharme et al., 2007; Elci et al., 2018; Firth and Britton, 1989; Zhang and Feng, 2011). Burnout is also associated with increased intention to emigrate (Anduaga-Beramendi et al., 2019), compounding the organisational economic losses of turnover, with wider economic losses.

3.5.6 Economic consequences

Much of the information on economic costs focuses on the organisational and economic costs of mental ill-health rather than specifically of burnout. A recent independent review in the UK estimated significant costs due to presenteeism, sick leave, and turnover attributable to mental ill-health (Stevenson and Farmer, 2017). Estimated costs to employers were between £33 billion and £42 billion per annum, and overall costs to the economy were between £74 billion and £99 billion. While these estimates include the costs of all mental ill-health in the workplace, and not just burnout, burnout is significantly associated with increased turnover and sick leave absences as well as presenteeism, and therefore a proportion of these substantial costs must certainly be attributable to burnout. Turnover is particularly costly for organisations. Shanafelt et al. (2017) suggest that replacing a physician costs 2-3 times the physician's annual salary, and that the turnover of one member of a healthcare team increases the risk of burnout for all remaining members of the team, thereby also increasing the risk of further future costs. A case study at Stanford, USA, estimated losses over a two-year period, attributable to burnout-related turnover, of between \$15,544,000 and \$55,506,000 (Hamidi et al., 2018). Furthermore, a study by Han et al. (2019) estimates that physician turnover and absenteeism secondary to burnout is responsible for costs in USA healthcare settings of approximately \$4.6 billion. This equates to approximate costs of \$7,600 per employed physician per annum and does not include additional healthcare costs for the physical and psychological consequences of burnout, nor does it account for losses due to migration which are likely to be low for the USA but potentially significantly higher for lower income countries (Kirigia et al., 2006). Intention to migrate is a recognised consequence of burnout and has a substantial economic impact. A

study in Hungary found that the burnout dimensions of EE and DP were both positively associated with intention to migrate (Győrfy et al., 2018), and a study in Peru found that burnout in nurses and physicians was positively associated with intention to migrate (Anduaga-Beramendi et al., 2019). Kirigia et al. (2006) looked specifically at economic losses due to migration in Kenya, a lower-middle-income economy, and calculated that for each doctor that emigrates, Kenya incurs losses of US\$517,931. Although causes of migration are multifactorial and not solely due to burnout, poor working conditions including low levels of remuneration, and the lack of clear career development pathways and career training and development opportunities, are recognised 'push' factors (Kirigia et al., 2006). These factors are also associated with the development of burnout. Thus, a proportion of these considerable losses may well be attributable to professional burnout.

3.5.7 Summary

In summary, the potential consequences of burnout in health service providers are substantial, ranging from an increased burden of physical and psychological ill health for practitioners and potential consequences for the quality and safety of patient care, to considerable organisational and societal economic costs. Despite a dearth of evidence for the economic costs of burnout, what there is suggests that the costs of burnout are sizable. This makes it imperative to accurately determine the prevalence of burnout, especially in those countries which combine a lack of information about burnout prevalence with vulnerabilities in terms of risk factors for burnout. It also makes it imperative to determine the costs of burnout more accurately and to develop effective, evidence-based interventions for burnout that are organisationally and culturally appropriate.

3.6 Interventions

Interventions to reduce or prevent burnout may be divided into three categories: those that focus on the individual; those that focus on the organisation; and those that use a combined approach. This next section will discuss the evidence for efficacy of these different categories of intervention.

3.6.1 Individually focused interventions

Despite the considerable contribution of organisational factors to the development of burnout, systematic reviews of burnout interventions in physicians have found that the majority of burnout interventions are individually focused and that these are associated with a small but significant decrease in burnout (Awa et al., 2010; Panagioti et al., 2017; West et al., 2016). Individually focused interventions, such as BREATHE (Salyers et al., 2011) and iWARDs (Rich et al., 2020), seek to develop the personal resources needed to mitigate occupational stress by delivering training in self-care strategies, mindfulness techniques, cognitive behavioural therapy (CBT), communication and interpersonal skills training, and education regarding self-efficacy and burnout (Awa et al., 2010).

BREATHE stands for Burnout Reduction: Enhanced Awareness, Tools, Handouts, and Education and a one-day pilot workshop showed significantly reduced EE and DP at six-week follow-up. However, there was no significant change in the PA dimension and little or no change in job satisfaction or turnover intention. It is possible that the follow-up period was too short to see changes in these factors (Salyers et al., 2011). Following this pilot study, a further, more rigorous study was done which compared BREATHE with an active control over a longer follow-up period. This failed to demonstrate significant benefit of BREATHE over the routine control workshop for reducing burnout (Rollins et al., 2016). Subsequently, a

comparative mixed methods study using the BREATHE programme also failed to demonstrate significant impact on burnout levels or turnover intention in its quantitative strand although qualitative results suggested a reduction in burnout (Salyers et al., 2019).

iWARDS (individualised **W**ellbeing **A**nd **R**esilience for **D**octors) was also developed as an individually focused intervention and combines more general strategies for self-care and well-being with strategies for managing digital boundaries such as email management, expectation of availability management, and management of notifications (Rich et al., 2020). This intervention was piloted in the UK's NHS and findings suggest that it can significantly reduce both exhaustion and disengagement. Qualitative feedback confirmed the value of the workshop environment and the therapeutic benefit of opportunities to discuss strategies for well-being. However, despite reductions in scores, overall scores remained high suggesting that individual interventions are not sufficient in isolation, but that structural and organisational changes also need to be made (Rich et al., 2020). In addition, individually focused interventions put the responsibility for preventing burnout, or mitigating its impact, back on to the worker when, in fact, many of the factors that contribute to the development of burnout are organisational and systemic. This may further increase pressure on an individual who is already under strain.

The COR stress theory posits that individuals will invest resources to prevent further resource loss, in this way, taking action to protect themselves against further stress and burnout. This idea of proactive personal burnout prevention was investigated by Otto et al. (2021) in a longitudinal study and was found to be effective at reducing burnout. However, this is only effective where the individual has resources that can be invested and as levels of burnout increase, resources for investment tend to decrease. Therefore, these proactive measures are only effective either as prevention where there is no burnout yet, or where burnout

levels are low, rather than as a treatment for higher levels of burnout. Higher initial levels of burnout will impede proactive prevention measures.

Other studies have investigated the efficacy of Mindfulness Based Stress Reduction techniques (MBSR), sometimes combined with principles from Acceptance and Commitment Therapy (ACT) and demonstrated significant reductions in burnout scores at follow-up. However, follow-up times have not extended beyond a year post intervention (Eriksson et al., 2018; Kinnunen et al., 2020; Puolakanaho et al., 2020). Studies using combinations of wellness techniques, relaxation techniques, positive psychological approaches, focus group discussions, and CBT have shown mixed results (Ansley et al., 2021; Bresó et al., 2011; Ghannam et al., 2020; Luo et al., 2019; Ripp et al., 2016; Siu et al., 2014). Several interventions demonstrated significant reductions in the EE dimension of burnout and some effect on the DP dimension but no impact on PA scores (Ansley et al., 2021; Ghannam et al., 2020), while one, using focus group discussions, demonstrated no significant difference between the intervention and the control group (Ripp et al., 2016).

A systematic review concurs with the findings of Ansley et al. (2021) and Ghannam et al. (2020), that, overall, person-focused interventions significantly impacted only the EE and DP dimensions, with no significant impact on PA (Dreison et al., 2018). Job training/educational interventions are the only type of intervention found to significantly impact on the PA dimension (Dreison et al., 2018). Another recent systematic review has found that the most successful individual approaches are those that incorporate a variety of therapeutic methods (Wiederhold et al., 2018). However, Wiederhold and colleagues found that many of the studies were methodologically weak, lacking both in randomised controls and in detailed information about the intervention used. Both systematic reviews highlight the need for more rigorous, detailed research on individual interventions for reducing burnout, and the

need for studies with longer follow-up periods. They conclude that different types of interventions might be useful to target different dimensions of burnout (Dreison et al., 2018; Wiederhold et al., 2018).

3.6.2 Organisationally focused interventions

Many of the established stressors implicated in the development of burnout are organisational in origin, and as such they may require organisational solutions (Maslach et al., 2001). In line with this a recent systematic review and meta-analysis of burnout interventions in physicians found that organisational interventions were associated with a greater reduction in burnout than individually focused interventions (Panagioti et al., 2017). Organisational interventions may be categorised as surveillance; manipulating stressors; improving employee/organisation fit; and developing services to reduce stress (Schaufeli and Enzmann, 1998). Surveillance involves the regular collection of data on stress levels within the organisation and seeks solutions to common stressors within the organisation through feedback and commitment to change. Manipulating stressors may involve anything from job re-design and clarification of roles to conflict management, to improving the physical job environment; and improving job fit might include, for example, career management or retraining. Finally, the provision of services may include the development of programmes to improve employee fitness and well-being, or to enhance occupational health services or employee assistance (Schaufeli and Enzmann, 1998). Alternatively, Montgomery et al. (2019) suggest that organisational interventions should target the six categories of the work-life model: workload; control; reward and recognition; community/social support; fairness; and values.

Interventions such as those designed to impact employees' perception of control and improve the quality of management and the learning environment (Mikkelsen et al., 2000); and those focusing on increasing decision latitude and improving social support, teamwork, recognition, and collaboration at work (Bourbonnais et al., 2011; Green et al., 2020) have been shown to reduce workplace stress. In addition, job training and educational interventions have been found to be significantly more effective at reducing overall burnout and increasing PA than organisational interventions targeting other aspects of work life (Dreison et al., 2018). Making changes in the work schedule has also been found to improve employee well-being and reduce burnout (Barrientos-Trigo et al., 2018; Ruotsalainen et al., 2015). Organisationally focused interventions require significant commitment from organisations; however, it is increasingly clear that organisations must acknowledge the significance of burnout and legitimise it as an organisational issue that requires attention (Hirayama and Fernando, 2016).

3.6.3 Combined interventions

Potentially, if both individually and organisationally focused interventions result in small improvements in burnout complaints, then combining these two approaches might prove more effective than either approach in isolation. A recent systematic review of combined approaches to facilitate a return to work after burnout found ten studies, all conducted in HICs (Pijpker et al., 2019). None used the same intervention, but all were effective in facilitating the return to work, with reductions in both exhaustion and cynicism. Although the aim of most of the studies was simply to reduce burnout complaints, three of the ten studies aimed for a complete return to work. The theoretical frameworks underpinning the interventions were variable with five using a job-person mismatch framework, one using the

demand-control-support framework (Karasek, 1979) and four not stating an underlying theoretical framework. The follow-up period was also variable, ranging from no follow-up after the post-intervention assessment to follow-up at 30 months, post intervention.

One of these studies found that combining the individual and organisational approaches was more effective than the traditional individual approach alone, resulting in significant reductions of both the exhaustion and the cynicism component of burnout (Hätinen et al., 2007). Although both exhaustion and cynicism responded to this intervention, the exhaustion component responded more quickly than the cynicism component, with improvements in exhaustion being seen within the first four months. In addition, Yip and Rowlinson (2009) designed a study to investigate the impact of job-redesign as an intervention strategy and found that job stressors are significant contributors to employee burnout and that job-redesign can significantly reduce employee burnout. Their intervention was comprised of three workshops delivering training in coping strategies, communication and negotiation skills, and time management. This was combined with organisational re-structuring to reduce workload together with job-employee matching regarding responsibility and autonomy.

Karlson and colleagues (2010) followed up the participants of their combined intervention for a total of 30 months, finding reductions in sick leave were significantly higher in the intervention group and that this difference persisted and was remarkably stable over time (Karlson et al., 2014; 2010). Other studies also showed significant reductions in burnout, especially the EE component, following combined interventions (Innstrand et al., 2004; Le Blanc et al., 2007; Riall et al., 2018). However, one study found that while a combined approach was more effective in facilitating a return to work, there was no difference

between this and an individually focused CBT approach for reducing psychological complaints (Blonk et al., 2006).

3.6.4 Summary

In summary, while individually focused interventions, especially those that are CBT based, show some effectiveness in reducing burnout complaints, it is likely that a combined individual/organisational approach is more effective, both in reducing exhaustion and cynicism, and in facilitating return to work following burnout. Training and educational interventions are the only interventions shown to be effective at increasing the PA component of burnout. However, there are relatively few studies investigating the combined approach and more work needs to be done to elucidate what is most effective and the underlying principles involved. Studies with longer follow up periods are also necessary to investigate the stability of intervention effects over time. It is likely that, while there may be underlying principles governing the most effective approaches, interventions will still need to be tailored, to some degree, according to the needs of individual organisations and workplaces. Of note is the fact that the majority of intervention studies have been done in HICs and there is a considerable lack of intervention studies from LMICs.

Chapter 4 A systematic review and meta-analysis of the prevalence and associated factors of burnout among primary healthcare professionals in low- and middle- income countries

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The published version is referenced below and can be found in Appendix B:

Wright, T., Mughal, F., Babatunde, O.O., Dikomititis, L., Mallen, C.D., Helliwell, T., 2022. Burnout among primary health-care professionals in low- and middle-income countries: systematic review and meta-analysis. *Bull World Health Organ* 100, 385-401A. <https://doi.org/10.2471/BLT.22.288300>

4.1 Introduction

This chapter is a systematic review which will identify, review, and synthesise the existing literature pertaining to the prevalence and associated factors of burnout in primary healthcare professionals working in LMICs and expose the gaps in this knowledge. It will begin with a discussion of the centrality of primary care in meeting the WHO priorities for UHC, followed by an introduction to burnout, outlining established risk factors for burnout and relating them to the current situation regarding workforce and resources in LMICs. The introduction will be followed by a description of the methods used for the literature review and the presentation of the results of a narrative review and meta-analysis. Finally, there will be a discussion of the implications of these findings and their importance with respect to this thesis and the direction of future research.

4.1.1 Primary healthcare

In many HICs the FP is central to the delivery of primary care. In contrast, in many LMICs, family medicine is not a recognised medical specialty and even in those countries where it is, much of the primary care is still delivered by clinical officers, nurses, or CHWs rather than physicians (Arya et al., 2017; Rao et al., 2013). Primary care, a term often used interchangeably with family medicine, has been described as the ‘gatekeeper’ of health services delivery, operating at the interface between community and health system. It is the point at which an individual first contacts health services and is characterised by continuity, a community and family approach, and the ability to see a broad range of health needs (Declaration of Alma-Ata, 1978; Kekki, 2003; Kruk et al., 2010). In 2002 the Europe division of The World Organisation of Family Doctors (WONCA) published a ‘definition’ of family medicine which identifies eleven characteristics (Allen et al., 2002). The first of these suggests that family medicine deals with any age of patient and any medical condition regardless of sex or other characteristic, that it is usually the point at which a patient makes first contact with healthcare services, and that this access should be open and unlimited. A more detailed discussion of the defining elements of primary care has been presented previously in Chapter 1, section 1.2.1.

UHC is a priority for the WHO and primary care has been identified as the cornerstone for achieving this (WHO, 2023a). UHC has as its goal the universal and cost-effective provision of health services, accessible without financial hardship (WHO, 2023a). Not only are sufficient numbers of primary healthcare professionals essential to achieving UHC, but they must be accessible, especially in rural areas, as well as sufficiently skilled, trained, and supported (WHO, 2016). The WHO (2016) workforce strategy sets out several objectives including optimising the job satisfaction, motivation, and performance of health workers together with

ensuring low rates of staff turnover and equitable distribution of staff, all of which may be impacted by burnout (Wang et al., 2020; Willard-Grace et al., 2019). Additionally, evidence from HICs that the prevalence of burnout differs between healthcare specialities, suggests that primary care is one of the higher risk specialities (Merritt Hawkins, 2018; Shanafelt et al., 2012, 2015). Therefore, establishing the prevalence of burnout in primary care professionals is crucial.

4.1.2 Background, risk factors and consequences of burnout

As mentioned previously, the WHO define burnout as a syndrome comprised of the three dimensions of physical and mental exhaustion; increased professional cynicism or negativity; and decreased professional competence or effectiveness (WHO, 2019a). This multidimensional definition of burnout is based on early research by Maslach (Schaufeli et al., 1993) and the three dimensions correlate with the three subscales used by the MBI, the dominant tool for the measurement of burnout (Maslach et al., 1996). Research in HICs has established burnout as a considerable problem within healthcare (British Medical Association, 2019; Merritt Hawkins, 2018). However, less is known about the extent of burnout among healthcare professionals in LMICs and it is vital that HIC results are not simply generalised to LMICs. Studies suggest that burnout prevalence rates differ between countries (Kumar, 2016), and that culture may play a role in these differences (Malach Pines, 2003). In addition, it is the balance of job demands and resources that underlies the development of burnout and this balance may differ substantially in LMICs from that in HICs (Bakker and Demerouti, 2007).

Major risk factors for burnout, such as workforce and resource shortages, understaffed workplaces, and heavy workloads, have been discussed in some detail previously, however it

is worth summarising these issues again to give context to this chapter. General workforce shortages are an independent predictor for burnout with a French study finding that a density of FPs below 7.75 per 10,000 population independently predicts FP burnout (Picquendar et al., 2019). In addition, understaffed work environments and heavy workloads have been identified as risk factors for burnout (Carod-Artal and Vázquez-Cabrera, 2013). Global shortages of healthcare professionals, greatest in the WHO regions of Africa and South-East Asia, increase the risk of burnout in these regions and lend an urgency to investigating burnout in these settings (Campbell et al., 2013; Crisp, 2011; WHO, 2016). Not only are workforce shortages a risk factor for burnout but they lead to increased workloads which are themselves a risk factor for burnout (Carod-Artal and Vázquez-Cabrera, 2013). This impact on workloads is exacerbated by the high disease burdens present in many LMICs as indicated by statistics presented previously (Chapter 1, section 1.2.2), which suggest that the regions of Africa and SE Asia combined account for 55% of the global burden of disease, despite being home to only 39% of the global population (Crisp, 2011; Dhillon et al., 2012; WHO, 2016). Global healthcare inequities extend beyond staffing to the financing and resourcing of healthcare, especially in lower-middle-income and low-income countries, further exacerbating the pressures on healthcare professionals and increasing their risk of burnout (Carod-Artal and Vázquez-Cabrera, 2013; Rachiotis et al., 2014; WHO, 2019b).

Burnout has significant consequences for healthcare professionals which have been discussed in some detail in Chapter 3, section 3.5. However, in summary, they include psychological and physical ill-health (Salvagioni et al., 2017); a reduction in the quality of care delivered (Salyers et al., 2016; Tawfik et al., 2019); high rates of sick leave and absenteeism (Anagnostopoulos and Niakas, 2010; Toppinen-Tanner et al., 2005); increased intention to leave as well as actual turnover (Willard-Grace et al., 2019); and increased migration to areas and countries which may have better working conditions (Anduaga-Beramendi et al., 2019).

These consequences result in considerable direct and indirect economic costs, making burnout in healthcare professionals a significant public health issue.

This combination of greater resource and workforce shortages, which are established risk factors for burnout, along with high burdens of disease in many LMICs suggest that the prevalence of burnout is likely to be high amongst primary healthcare professionals in these countries. Indeed, a 2018 systematic review (Dugani et al., 2018) found this to be the case with high levels of burnout in primary healthcare professionals across LMICs. However, a methodological quality assessment analysis of included studies was not done, only English language studies were included, and searches were limited to the following three electronic databases: EMBASE, MEDLINE, and Commonwealth Agricultural Bureau (CAB). In addition, searches were completed by January 2016, and therefore, it is possible that there have been a significant number of further publications in the intervening years. Furthermore, the impact of the COVID-19 pandemic on burnout prevalence warrants investigation.

4.1.3 Aims and Objectives

The research questions for this systematic review are:

- What is the prevalence of burnout among primary care professionals in LMICs?
- What are the risk factors and protective factors associated with burnout in LMICs?
- What is the impact of the COVID-19 pandemic on burnout prevalence in LMICs?

The aim of the review is to investigate the prevalence of burnout among primary care professionals and identify the associated factors. This will be accomplished through the following objectives:

1. To estimate the prevalence of burnout among primary healthcare practitioners in LMICs
2. To compare the prevalence of burnout in primary healthcare practitioners in different countries/regions
3. To identify risk factors associated with burnout
4. To identify factors that protect against burnout
5. To include data collected during the COVID-19 pandemic for comparison with pre-pandemic data

4.2 Method

In line with the recommendation that systematic review protocols are pre-defined and made publicly available to ensure transparency and research integrity, as well as reducing publication bias (McDonagh et al., 2008; Moher et al., 2015), the study protocol has been registered with PROSPERO, registration number: CRD42020221336 (Wright et al., 2020) and is included in Appendix C.

4.2.1 Databases and search strategy

4.2.1.1 Databases

A systematic search was conducted in the following nine electronic databases from database inception to November 2020: MEDLINE, CINAHL, APA PsychInfo, APA PsychArticles, AMED, EMBASE, Web of Science Core Collection, WHO – Global Index Medicus, and CNKI. Searches were updated on February 11th, 2022, to include data collected during the COVID-19 pandemic. The study of burnout crosses several disciplines including psychology, sociology,

and behavioural sciences; occupational and organisational disciplines; and, due to its impact on health, biomedical disciplines. Therefore, a broad range of databases were chosen to ensure that journals from all different disciplines are included. In addition, WHO-Global Index Medicus and CNKI (China National Knowledge Infrastructure) were added to broaden the search still further and include LMIC publications that may not be available in the larger databases.

MEDLINE is a comprehensive database for the life sciences and biomedical literature and includes more than 5,200 journals and 27 million references published since 1966 (National Library of Medicine, 2021). It also indexes according to Medical Subject Headings (MeSH) allowing searches to be conducted using these specific and standardised terms. EMBASE extends MEDLINE, adding an additional 2,900 unique journals with an inception date of 1947 (Elsevier, 2021). CINAHL also includes biomedical literature but focuses on nursing and allied health disciplines while AMED has a more specialised focus on allied and complementary health journals (EBSCO, 2021). This combination should provide comprehensive coverage of the relevant biomedical literature.

Both APA PsychInfo and APA PsychArticles, index leading psychology, behavioural, and social science journals (EBSCO, 2021). While APA PsychArticles only includes the American Psychological Association (APA) collection, APA PsychInfo has a broader range of indexed journals, covering more than 50 countries and dating back to the 1800s (EBSCO, 2021). The addition of the Web of Science Core Collection, which includes over 21,100 journals covering a broad range of disciplines, including science, social science, and humanities (Clarivate, 2021), provides comprehensive access to published research from the psychological, behavioural science, and sociological disciplines, as well as occupational and organisational disciplines.

Finally, two further databases were added to extend access to research from LMICs. The first, WHO-Global Index Medicus is a repository for biomedical research, including public health research, specifically produced by LMICs, and aggregated into a single database by the WHO regional offices (WHO, 2021). CNKI is the largest Chinese database for research literature and is broad in scope, covering a wide range of disciplines (CNKI, 2021).

4.2.1.2 Search strategy

Keele University's (KU) School of Medicine hosts a team of systematic review experts who provide expert advice and support for researchers conducting systematic reviews.

Accordingly, the search strategy adopted for this review was developed in collaboration with a member of this team (Dr Opeyemi Babatunde, co-author) as per recommendations to seek expert advice on the development of search strategies (Johnson and Hennessy, 2019). Dr Babatunde provided advice and feedback on the suggested search terms and the finalised search strategy and is a co-author on the published paper. Searches used Boolean operators to combine free text as well as MeSH terms for primary healthcare providers (population), burnout (condition of interest), and LMICs (setting). The full search strategy conducted on MEDLINE (EBSCOhost) is included in Appendix D. Database searches were supplemented with hand searching reference lists as well as approaching professional colleagues (Johnson and Hennessy, 2019). Searches were not limited by publication date or language. Google Translate (Google Translate, 2021) was used for the translation of non-English studies (see section 4.5).

4.2.2 Study selection

4.2.2.1 Inclusion and exclusion criteria

The next step in a systematic review is the selection of appropriate studies, and it is important that selection criteria are defined a priori and that they are clear and unambiguous to reduce error (McDonagh et al., 2008). Inclusion criteria for this review are broad with very few limitations, reflecting an approach that is as inclusive as possible. Both inclusion and exclusion criteria are summarised in Table 4.1.

Table 4.1 Inclusion and Exclusion criteria

Inclusion criteria	Exclusion criteria
Study design – cross-sectional or cohort studies	Duplicates, or secondary research – for example, narrative reviews or opinion pieces
Setting - LMICs, as defined by the World Bank income classification 2020	Studies where data is from high-income countries as defined by the World Bank income classification 2020
Population – Primary healthcare professionals working in community settings	Studies involving or including hospital based secondary care practitioners or specialists where there is no separate data for primary care practitioners Studies on medical students
Primary outcome - Burnout prevalence as measured by a validated burnout measurement tool or by self-report Secondary outcome – factors associated with burnout	Research focused on anxiety, depression, or occupational stress which does not have a specific focus on burnout

Studies were included if they were cross-sectional or cohort studies as these are appropriate study designs for observational epidemiological studies (Thiese, 2014). In line with the aims and objectives of this review, the setting for studies was defined as any LMIC as defined by the World Bank Income Classification (World Bank, 2020). Those not set in an LMIC were excluded. The World Bank Income Classification country list for 2020 is included in Appendix E.

The inclusion criteria also define the population of interest. Primary care in LMICs is often delivered by a range of different healthcare professionals (Arya et al., 2017; Rao et al., 2013), thus, we have chosen to include studies involving any of the different cadres of primary care professionals, for example, primary care nurses, community midwives, CHWs as well as generalist physicians or FPs. These must be community-based healthcare professionals rather than hospital specialists and although community midwives, and oral health teams do not fulfil the generalist approach of ‘any patient with any medical problem’ they do fulfil the other primary care criteria outlined earlier. These slightly more specialised primary care professionals were included to maintain as complete a picture of burnout in primary care professionals as possible as they also act as an interface between the community and the health system. Studies on hospital-based secondary care or specialist professionals were excluded, as well as studies including mixed populations of primary and secondary healthcare professionals unless the data for each population was presented separately. The practice of primary care is significantly different from that of secondary care and, as such, the stresses and strains in primary care are also different. Uncertainty is a much greater feature in primary care as access to diagnostic resources may be limited, and the presentation and prevalence of disease in the community differs from that referred on to secondary care (Allen et al., 2002). Thus, secondary care data was excluded to enable us to get an accurate estimate of the burden of burnout specifically in primary care.

Finally, the outcomes were chosen to meet the aim of the study which is to estimate the prevalence of burnout and investigate any associated factors. In view of the wide range of freely available and validated burnout measurement tools available, studies which did not use a validated measurement tool for burnout, or studies investigating similar but distinct related concepts, such as anxiety or depression, were excluded.

4.2.2.2 Screening process

Initial search results were exported to Rayyan (2021) for title screening and de-duplication. Title screening was completed by one reviewer (TW) with 10% of titles screened by a second reviewer (FM) for comparability. Although screening is usually completed by two independent reviewers for both title and abstract screening, and full text screening, it is reasonable for title screening to be carried out by a single reviewer provided a proportion of titles are double screened and compared to ensure consistency (McDonagh et al., 2008). This independent screening ensures transparency and consistency in the application of selection criteria as well as reducing simple errors (Waffenschmidt et al., 2019).

Online systematic review management platforms may be used to streamline this screening process by organising and recording the progress of multiple reviewers simultaneously. Two different management platforms, Rayyan (2021) and Covidence (2021), were used for screening in this systematic review. Rayyan (2021) was chosen initially for screening as it is a freely available resource that aims to streamline the screening process for systematic reviewers. However, after using it for title screening, and finding it somewhat unwieldy abstracts were transferred to Covidence (2021) for abstract and full text screening as the reviewers felt that Covidence was more intuitive and easier to use. Covidence is the preferred platform for Cochrane reviews and is freely available for up to 500 abstracts. Abstract and full text screening were completed by two reviewers (TW and FM) using Covidence and disagreements were resolved through discussion.

4.2.3 Data extraction, quality assessment, and analysis

4.2.3.1 Data extraction and quality assessment

The data to be extracted was decided by the team based on the information required to answer the research question and fulfil the aims and objectives of the study. Decisions on the items of data for extraction were made a priori and set out in the study protocol as per recommendations (Johnson and Hennessy, 2019). The following data were extracted: study author and year of publication; country; income group and World Bank region; study design; sample size and sampling procedure; mean age of sample; percentage of men and women; professional role; burnout measurement tool used; and burnout prevalence data, together with the definition of burnout used in the study and any significant factors associated with burnout. The extraction of significant associated factors included demographic factors such as age and marital status; work-related factors such as workload and years of service; and a category of 'other' for any unanticipated factors found to be significantly associated with burnout. A variety of burnout prevalence data were extracted including the overall burnout prevalence if reported, along with separate prevalence percentages for each subscale or dimension of burnout, and the prevalence of low, moderate, and high levels on each subscale.

Dual, independent data extraction is as important as the dual, independent screening of studies for selection and, as with study selection, any disagreements should be resolved through discussion (Johnson and Hennessy, 2019). Therefore, data was extracted independently by two reviewers (TW and FM) using a form developed for the study as an excel spreadsheet and reviewed and agreed by the wider study team (see Appendix F). As part of the data extraction process a methodological quality assessment was completed for each study using a validated tool for assessing the risk of bias. This is important to determine

the quality of the data included in the synthesis (Johnson and Hennessy, 2019; MacKenzie et al., 2012). The risk of bias tool used was developed for prevalence studies and is described in more detail in section 4.2.3.2. The data extraction form was piloted before use and any disagreements in the data extracted and/or the result of the quality assessment were resolved through discussion. In studies with duplicate datasets the most recent study or the one with the most comprehensive data was included.

4.2.3.2 Risk of bias tool

The risk of bias was assessed using a tool that is validated and used widely for cross-sectional studies (Hoy et al., 2012) embedded into the data extraction proforma. The tool consists of 10 questions, with a response of 'yes' scoring 1 and a response of 'no' scoring 0. The first four questions assess the external validity of the study, the remaining 6 questions assess the internal validity of the study. These scores are then summed for a final score out of 10 for each study. Overall scores 0-4, 5-7, and 8-10, then classify the studies as high risk, moderate risk, or low risk of bias, respectively. The risk of bias tool is included in Appendix G.

4.2.3.3 Analysis

Results from all the eligible studies were narratively reported. However, only the studies that used the MBI as their measurement tool and reported a prevalence percentage for each of the subscales were included in the meta-analysis. This was done to reduce methodological heterogeneity in the meta-analysis, as detailed in the following section.

4.2.3.3.1 Random effects meta-analysis

The random effects model was used for meta-analysis which was carried out by MetaXL version 5.3 (EpiGear International Pty Ltd) using the double arcsine transformation variant for meta-analysis of prevalence (Barendregt et al., 2013). Random effects meta-analysis is carried out in studies where some degree of heterogeneity is expected and assumes a normal distribution of effect, rather than identical effect (Higgins et al., 2012). Heterogeneity may be either clinical or methodological. Clinical heterogeneity refers to differences in the participants, settings, interventions, or outcomes studied, whereas methodological heterogeneity refers to differences in the measurement tools used or the study quality (Higgins et al., 2012). Methodological heterogeneity is particularly relevant in burnout studies due to the wide diversity of measurement tools for burnout and the variety of ways in which results from the same measurement tools are reported. Consequently, meta-analysis across different burnout measurement tools is problematic. Therefore, studies were only included in the meta-analysis if they used the MBI as their measurement tool and reported prevalence estimates for each subscale. Subscales were then analysed separately. Heterogeneity was assessed by inspection of the forest plots and calculation of I^2 with a score of >60% indicating a high degree of heterogeneity (Higgins et al., 2012). Pooled prevalence estimates were reported with 95% confidence intervals (CI). Sub-group analysis of professional groups was also carried out.

4.2.3.3.2 Publication bias

Publication bias has been described as the 'Achille's heel' of systematic reviews and occurs when systematic error results from the tendency to preferentially publish statistically significant positive results (Torgerson, 2006). The converse is also true. There is a tendency to

'file' statistically significant negative results or those that are not statistically significant, known as the 'file-drawer effect'. Consequently, there is a tendency for published studies to have larger effect sizes and sample sizes than unpublished studies, and this bias may pose a significant threat to the validity of a systematic review (Torgerson, 2006).

Traditionally, funnel plots are used to assess publication bias and are used in conjunction with Egger's regression statistic, a statistical measure that quantifies the asymmetry of the funnel plot (Furuya-Kanamori et al., 2018). Although Egger's regression statistic was developed to aid in detecting asymmetry in the funnel plot, it has been criticised for a lack of sensitivity in systematic reviews with small numbers of studies (Furuya-Kanamori et al., 2018). Funnel plots are essentially scatter dot plots and plot the effect estimate for each study against the standard error which is a measure of the precision of the study. Normally, there is no association between effect size and precision and the result, when each study is plotted, resembles an inverted funnel shape. However, asymmetry in this inverted funnel shape indicates the existence of an association between precision and effect size and the possibility of publication or other bias. Asymmetry may also be caused by both heterogeneity and chance (Furuya-Kanamori et al., 2018). The visual detection of symmetry is very subjective and, in fact, a study by Terrin et al. (2005) found that only 50% of funnel plots were interpreted correctly, little different from the odds of a coin toss. Funnel plots have also been determined to be inaccurate when used to assess publication bias in proportion studies (Hunter et al., 2014).

In response to these concerns over traditional methods of assessment, a new method of assessing publication bias was developed called the doi plot and LFK index (Furuya-Kanamori et al., 2018). Doi plots were developed to improve the subjectivity of the visual representation of the funnel plot by plotting the normal quantile (Z-score) against effect

rather than precision against effect. The visual representation of a quantile plot is superior to that of a scatter plot, and they are a well-established method for detecting normality. The result is an inverted funnel or tent shaped graph where the study data forms the limbs of the plot, rather than its body. As with the funnel plot, symmetry indicates a low probability of publication bias and is represented by both the shape of the graph and the number of studies in each limb. The reference point for symmetry is taken to be the effect size with the smallest absolute Z-score (Furuya-Kanamori et al., 2018).

The LFK index is a measure of the symmetry of the doi plot. It quantifies both the difference between the areas under the graph either side of the reference point and the difference between the number of studies in each limb of the graph. The closer the difference (LFK index) is to zero, the greater the symmetry and the lower the risk of publication bias. The thresholds for asymmetry have been defined as ± 1 with an LFK index greater than +1 suggesting the presence of a positive publication bias and an LFK index less than -1 suggesting the presence of a negative publication bias. The LFK index has been determined to have a sensitivity of 70% at this threshold and its specificity increases as the number of studies increases. However, at all numbers of studies, it detected publication bias more accurately than Egger's regression statistic (Furuya-Kanamori et al., 2018).

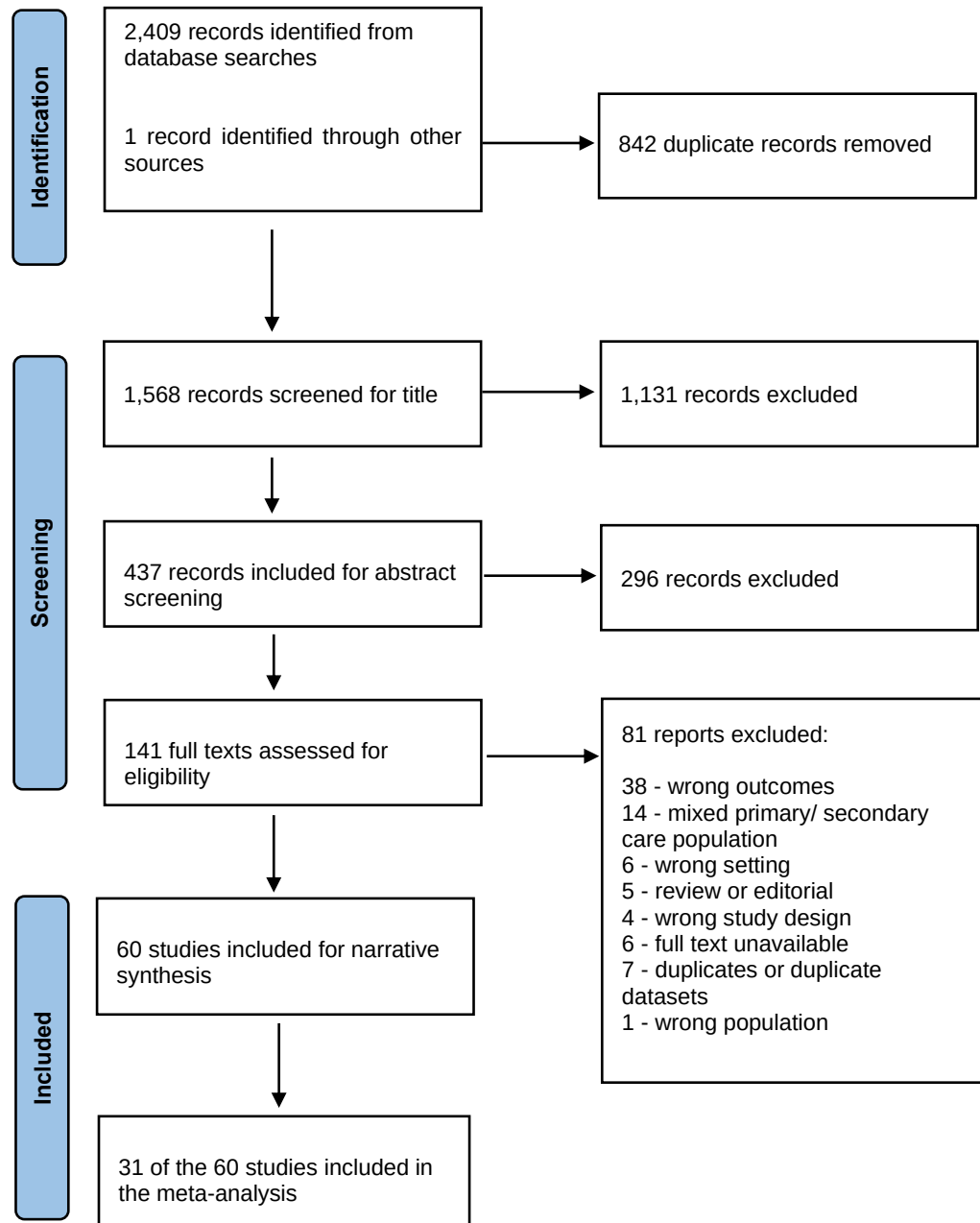
In view of the greater sensitivity and specificity of doi plots and the LFK index, especially with low numbers of studies, publication bias in this study was assessed using doi plots and calculating the LFK index.

4.3 Results

Initial searches identified a total of 2,410 articles, of which 842 duplicates were removed, leaving 1,568 unique articles for title screening. A further 1,427 were identified as ineligible

at title and abstract screening, leaving 141 for full text screening. At full text screening a further 81 studies were excluded, leaving 60 studies for data extraction. For the 10% of titles that were double screened there was a 93.6% concordance rate between reviewers. Figure 4.1 illustrates this process and is presented in the format advised by PRISMA, including reasons for exclusion.

Figure 4.1 PRISMA Flowchart summarising full text identification after title and abstract screening



*Note: There was a 93.6% concordance rate in the 10% of titles that were independently screened by the second reviewer

4.3.1 Study characteristics

The 60 studies included in the systematic review represented a total population of 61,089 from 20 LMICs (n=135). Sample sizes ranged from 28 to 21,759. One international European study included two LMICs, Turkey and Bulgaria (Soler et al., 2008). The data pertaining to these two LMICS have been extracted and analysed as separate datasets resulting in 60 studies but 61 different country datasets. The study characteristics are detailed in Table 4.2. Studies are arranged by population studied, with the physician studies first, followed by the community nurse studies and then the remaining studies on CHWs, community oral teams, midwives, and mixed populations of primary care professionals.

1 Table 4.2 Study characteristics

Lead author and year	Country	Population	Burnout measurement tool	Sample size (n)	Mean age	Women (%)	Overall burnout prevalence (%)	EE (%)	DP (%)	PA (%)
Putnik, 2011	Serbia	Family physicians	MBI-GS	373	47	84	..	high – 48.3 moderate – 34.0	high – 12.9 moderate – 32.7	high – 5.1 moderate – 16.9
Mandengue, 2017	Cameroon	Family physicians	MBI-HSS	85		48.2	42.4	high – 11.8 moderate – 18.8	high – 10.6 moderate – 31.8	high – 30.6 moderate – 29.4
Lopez-Leon, 2007	Mexico	Family physicians	MBI	131	46.4 (SD 6.3)	42	39.7	high – 26.0 moderate – 22.1	high – 19.8 moderate – 12.3	high – 8.4 moderate – 14.5
Lesic, 2009	Serbia	Family physicians	MBI	38	42.2 (SD 10.7)	79.0	..	high – 29.0 moderate – 45.2	high – 11.1 moderate – 27.8	high – 24.2 moderate – 27.3
Kotb, 2014	Egypt	Family physicians	MBI	31		80	41.94			
Kosan, 2019	Turkey	Family physicians	MBI	2008: 139; 2012: 246; Total: 385	2008: 30 (SD 5.13) 2012: 34.05 (SD 5.78)	2008 – 48.9; 2012 – 72.8; Overall 35.8	..	2008: high – 0.7 moderate – 24.5 2012: high – 9.3 moderate – 21.5	2008: high – 4.3 moderate – 18.0 2012: high – 4.5 moderate – 19.9	2008: high – 76.3 moderate – 21.6 2012: high – 79.3 moderate – 17.4
Gan, 2019	China	Family physicians	MBI-HSS	1015	..	..	2.46 – high on 3 subscales, 21.0 - 2 subscales, and 35.0 - one subscale	high- 24.83 moderate – 23.25	high – 6.21 moderate – 12.0	high – 33.99 moderate – 20.0
Charoentanyarak 2020	Thailand	Family physician residents	MBI-HSS	149	28.29 (SD 2.59)	67.1	10.74	high – 33.56 moderate – 30.87	high – 14.09 moderate – 27.52	high – 1.34 moderate – 2.68
Stanetić 2013	Bosnia and Herzegovina	Family physicians	MBI-HSS	239	..	83.3	..	high – 46.0 moderate – 28.9	high – 21.3 moderate – 31.8	high – 22.2 moderate – 34.7

Lead author and year	Country	Population	Burnout measurement tool	Sample size (n)	Mean age	Women (%)	Overall burnout prevalence (%)	EE (%)	DP (%)	PA (%)
Cetina-Tabares 2006	Mexico	Family physicians	MBI	93	44	46.2	20.5 – high on 3 subscales; 29.0 – moderate on 3 subscales	..	..	..
Soler 2008	Bulgaria, Turkey	Family physicians	MBI-HSS	Bulgaria – 69 Turkey - 112	..	..	..	Bulgaria: high – 62.3 Turkey: high – 15.2	Bulgaria: high – 30.4 Turkey: high – 15.2	Bulgaria: high – 18.8 Turkey: high – 69.4
Aranda 2004	Mexico	Family physicians	MBI-HSS	163	47	36.2	42.3	high – 16.0 moderate – 16.0	high – 1.8 moderate – 5.5	high – 6.7 moderate – 8.6
Aranda-Beltran 2005	Mexico	Family physicians	MBI	197	..	37.1	41.8	high – 13.3 moderate – 17.9	high – 2.0 moderate – 6.6	high – 6.6 moderate – 7.7
Dabbagh 2019	Iraq	Family physicians	MBI	134	..	64.8	high – 30.6 moderate – 50.0	high – 68.7 moderate - 11.9	high – 26.1 moderate - 28.4	high – 41.1 moderate – 26.1
Ahmadpanah 2015	Iran	Family physicians	MBI	100	32.90 ± 5.06	29	..	high – 15.4	high – 14.5	high – 10.2
Aguilera 2010	Mexico	Family physicians	MBI-HSS	233	44.4 ± 7.18	40.3	41.6	high – 31.7	high – 15.02	high – 15.9
Račić 2019	Bosnia and Herzegovina	Family physicians	Compassion fatigue questionnaire	120	..	80	moderate - 75	..	..	..
Rossouw 2013	South Africa	Family physicians	MBI	132	..	..	..	high - 53	high - 64	high - 43
Çevik and Ungan 2021 (Covid)	Turkey	Family physician residents	Burnout measure (short version)	477	median = 28 (24-54)	61.2	moderate - 25.8 severe - 24.1 very severe - 23.3	..	..	..

Lead author and year	Country	Population	Burnout measurement tool	Sample size (n)	Mean age	Women (%)	Overall burnout prevalence (%)	EE (%)	DP (%)	PA (%)
Zhang 2021	China	Family physicians	Chinese version MBI-GS	2693	44.64 ± 7.25	35.6	65.2	high - 30.1 moderate - 24.2	high - 22.2 moderate - 11.7	high - 48.3 moderate - 13.3
Engelbrecht 2008	South Africa	Community nurses	MBI	542	..	..	..	high – 68.7 moderate – 30.9	high – 85.1 moderate – 12.9	high – 8.3 moderate – 91.0
Hu 2015	China	Community nurses	MBI	420	..	100	86.2	..	..	..
Alshawish 2020	West Bank and Gaza	Community nurses and midwives	MBI	207	..	91.3	10.6	high – 36.7 moderate – 17.9	high – 14.0 moderate – 20.8	high – 17.9 moderate – 19.3
Merces 2017	Brazil	Community nurses	MBI-HSS	60	39.55 (SD 10.38)	95	58.3 – on at least one; 16.7 – all 3	high – 18.3 moderate – 43.3	high – 48.3 moderate – 41.7	high – 56.6 moderate – 41.7
Merces 2016a	Brazil	Community nurses	MBI	28	39.1 (SD 9.6)	100	7.1	high – 28.6 moderate – 39.3	high – 21.5 moderate – 32.1	high – 46.4 moderate – 50.0
Ramos 2019	Brazil	Community nurses	MBI	52	..	100	..	high – 15.4 moderate – 34.6	high – 13.5 moderate – 34.6	high – 23.1 moderate – 21.2
Merces 2016b	Brazil	Community nurses	MBI	189	..	96.8	10.6	high – 20.6 moderate – 40.7	high – 31.7 moderate – 39.2	high – 48.1 moderate – 49.2
Lorenz 2018	Brazil	Community nurses	MBI	168	..	88.4	..	high – 28.0 moderate – 37.5	high – 32.1 moderate – 33.9	high – 38.7 moderate – 33.3
Holmes 2014	Brazil	Community nurses	MBI	45	..	100	11.1	high – 53.3 moderate – 20.0	high – 11.1 moderate – 28.9	high – 11.1 moderate – 48.9
Seluch 2021 (Covid)	Russian Federation	Community nurses	Emotional Burnout Diagnostics by Boyko V.V.	60	40.86	100	50	..	..	..
das Merces 2020	Brazil	Community nurses	MBI-HSS	1125	37.1 (SD 9.6)	87.9	18.3	high – 28.1 moderate – 41.1	high – 44.5 moderate – 35.9	high – 60.2 moderate – 36.2

Lead author and year	Country	Population	Burnout measurement tool	Sample size (n)	Mean age	Women (%)	Overall burnout prevalence (%)	EE (%)	DP (%)	PA (%)
Garcia 2021	Brazil	Community nurses	Burnout characterisation scale (BCS)	122	45.2 (SD 9.8)	94.3	..	high - 27.9 moderate - 37.7	(dehumanisation) high - 25.4 moderate - 41.8	(disappointment) high - 25.4 moderate - 47.5
Silveira 2014	Brazil	Mixed primary care	CESQT	217	..	88.9	Profile 1 – 18 Profile 2 - 11	..	..	..
da Silva 2008	Brazil	Mixed primary care	MBI	141	38.9 (SD 11.4)	92.2	24.1	moderate or high – 70.9	moderate or high – 34.0	moderate or high – 47.5
Selamu 2019	Ethiopia	Mixed primary care	MBI-HSS	136	..	61	3.8 at baseline (T1) 4.6 at 6 month follow up (T2)	T1 - high 7.7 T2 - high 7.5	excluded	T1 – 43.7 T2 – 48.5
Hernández 2003	Cuba	Mixed primary care	short questionnaire of burnout	144	..	77.1	doctors – 43.8 nurses – 27.3	..	..	..
Ran 2020	China	Mixed primary care	MBI-GS	1279	..	66.5	18.69	..	..	..
Pinheiro 2020	Brazil	Mixed primary care	CESQT	344	40 (SD 9.7)	88.7	Profile 1 – 14.4 Profile 2 – 44.5	..	..	..
Mao 2020	China	Mixed primary care	MBI	663	..	44.5	..	high – 24.1 moderate – 14.6	high – 15.7 moderate – 7.4	high 34.7 moderate – 15.8
Lima 2018	Brazil	Mixed primary care	MBI-HSS	153	45 (SD 9.78)	82.4	51	..	..	..
Li 2019	China	Mixed primary care	MBI-HSS	951	..	65.1	..	high – 33.1 moderate – 32.9	high – 8.8 moderate – 19.8	high – 41.43 moderate – 20.5
Kruse 2009	Zambia	Mixed primary care	Single-item scale	483	37 (IQR 31-45)	87	51.2	..	..	..
Hernández-Vargas 2009	Mexico	Mixed primary care	MBI	276	..	..	..	high – 34.8 moderate – 30.1	high – 35.1 moderate – 19.6	high – 36.2 moderate – 30.4

Lead author and year	Country	Population	Burnout measurement tool	Sample size (n)	Mean age	Women (%)	Overall burnout prevalence (%)	EE (%)	DP (%)	PA (%)
Xu 2020	China	Mixed primary care	MBI	15,627	..	66.2	high – 3.3 moderate – 47.6	..	..	..
Wang 2020	China	Mixed primary care	MBI	1,148	..	64.72	..	high - 27.66	high – 6.06	high – 38.74
Tomaz 2020	Brazil	Mixed primary care	OLBI	94	40.9 (±9.6)	84	38.3	21.3	..	..
de Souza Filho 2019	Brazil	Mixed primary care	CESQT	248	40.75 (SD = 9.66)	91.1	Profile 1 – 24.2 Profile 2 – 8.5	..	..	..
da Silva 2021	Brazil	Mixed primary care	MBI	2,940	36.7 (SD = 9.6)	90.5	Severe – 11.4	high – 39.7 moderate – 24.9	high – 11.8 moderate – 24.5	high – 18.3 moderate – 27.2
Yan 2021	China	Mixed primary care	Chinese version MBI	1,214	40.26 (SD = 8.61)	55	severe - 11.3 moderate - 37.6	..	..	..
Lu 2020	China	Mixed primary care	MBI	21,759	35	70.0	50.09 severe = 2.99 moderate = 47.1	..	..	..
Malakouti 2011	Iran	Community health workers	MBI	212	35.1 (SD 7.2)	70.1	high 1.1 moderate 16.6	high – 12.3 moderate – 15.1	high – 5.3 moderate – 8.0	high – 43.7 moderate – 19.0
Mota 2014	Brazil	Community health workers	MBI	222	..	87.8	29.3	Moderate to high – 57.7	Moderate to high – 51.8	Moderate to high – 59.0
Martins 2014	Brazil	Community health workers	MBI	107	..	..	41.6	high – 20.6 moderate – 52.3	high – 21.1 moderate – 50.0	high – 20.6 moderate – 55.4

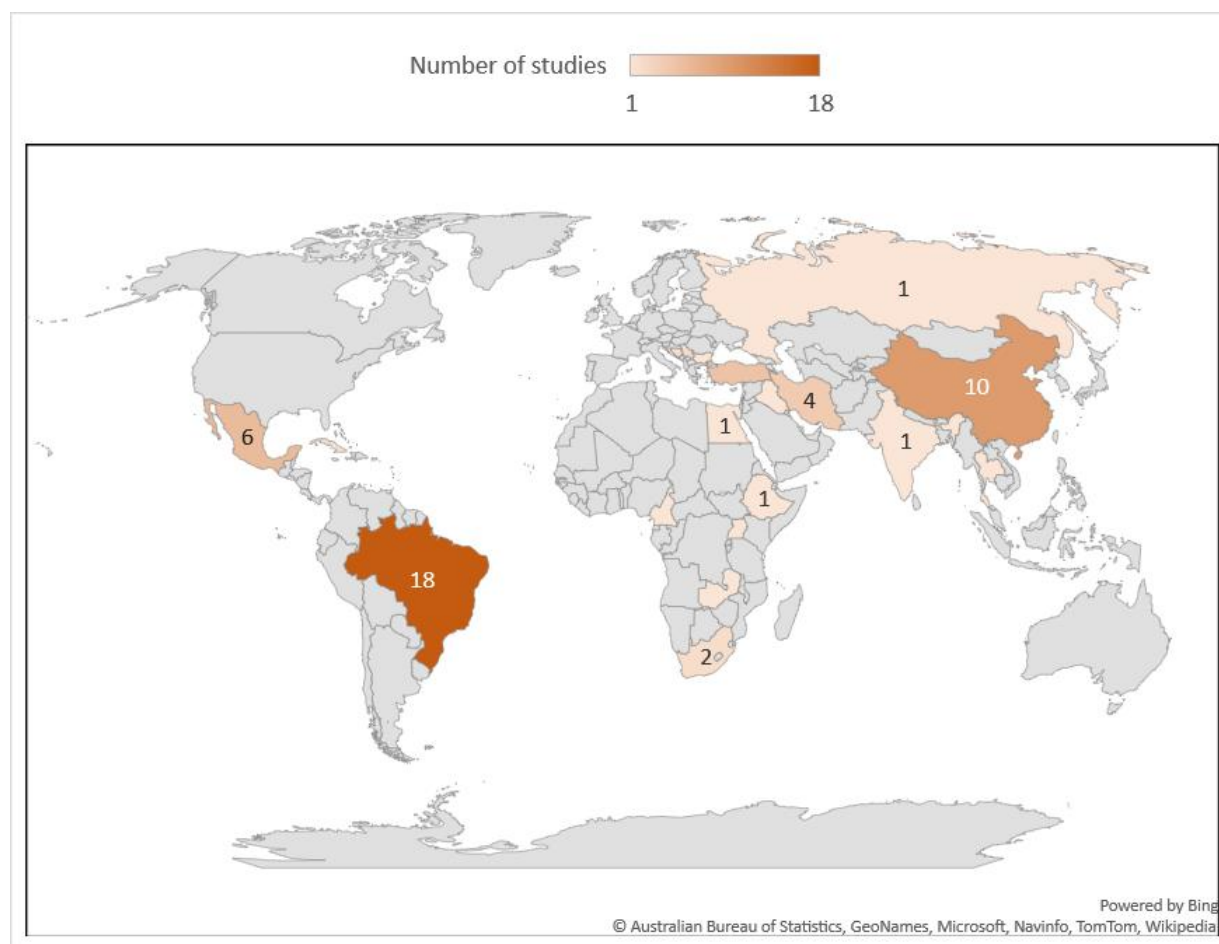
Lead author and year	Country	Population	Burnout measurement tool	Sample size (n)	Mean age	Women (%)	Overall burnout prevalence (%)	EE (%)	DP (%)	PA (%)
Pulagam 2021	India	Community health workers	CBI	150	..	100	personal burnout: high - 8.0 moderate – 30 work burnout: high - 8.7 moderate - 24.7 client burnout: high 6.7 moderate - 23.3	..	..	..
Bijari 2016	Iran	Community health workers	MBI	423	39 ± 8.4	57.9	5.7 – high on all 3 28.8 – high on either EE or DP	high – 17.7 moderate – 13.7	high – 6.4 moderate – 10.4	high – 53.0 moderate – 18.2
Amiri 2016	Iran	Community health workers	MBI	548	35.8± 7.5	71	high – 5.5 moderate – 52.7	high – 17.3 moderate – 18.4	high – 8.8 moderate – 10.0	high – 33.9 moderate – 15.7
Muliira 2016	Uganda	Midwives	Professional quality of life scale	224	34 (SD 6.3)	79.5	high – 10.3 moderate – 87.9	..	..	..
Maciel 2018	Brazil	Community oral health team	MBI-HSS	50	..	72	..	high – 26 moderate – 32	high – 16 moderate – 26	high – 10 moderate - 26
Calgan 2011	Turkey	Community pharmacists	MBI	251	42.06 ± 11.19	58.6	..	high – 1.2 moderate – 27.1	high – 0.8 moderate – 13.9	high – 71.3 moderate – 24.7
Okuyan 2021 (Covid)	Turkey	Community pharmacists	Burnout measure (short version)	1,098	41	64.8	31.5	..	..	..

4.3.1.1 Geographical spread of studies

The greatest number of studies came from Brazil (n=18), (Barbosa Ramos et al., 2019; da Silva et al., 2021; das Mercedes et al., 2016; Filho et al., 2019; Garcia and Marziale, 2021; Holmes et al., 2014; Lima et al., 2017; Lorenz et al., 2018; Maciel et al., 2018; Martins et al., 2014; Mercedes et al., 2020, 2017, 2016; Mota et al., 2014; Pinheiro et al., 2020; Silva and Menezes, 2008; Silveira et al., 2014; Tomaz et al., 2020) followed by China (n=10) (Gan et al., 2019; Hu et al., 2015; Li et al., 2019; Lu et al., 2020; Mao et al., 2020; Ran et al., 2020; Wang et al., 2020; Xu et al., 2020; Yan et al., 2021; Zhang et al., 2021). In addition, there were six studies from Mexico (Aguilera and de Alba García, 2010; Aranda et al., 2004; Aranda-Beltrán et al., 2005; Cetina-Tabares et al., 2006; Hernández-Vargas et al., 2009), five from Turkey (Calgan et al., 2011; Çevik and Ungan, 2021; Kosan et al., 2019; Okuyan et al., 2021; Soler et al., 2008), four from Iran (Ahmadpanah et al., 2015; Amiri et al., 2016; Bijari and Abassi, 2016; Malakouti et al., 2011), two from each of Serbia (Lešić et al., 2009; Putnik and Houkes, 2011), Bosnia and Herzegovina (Račić et al., 2019; Stanetic and Tesanovic, 2013), and South Africa (Engelbrecht et al., 2008; Rossouw et al., 2013), and one study from each of Bulgaria (Soler et al., 2008), Thailand (Charoentanyarak et al., 2020), Cameroon (Mandengue et al., 2017), Egypt (Kotb et al., 2014), Ethiopia (Selamu et al., 2019), Uganda (Muliira and Ssendikadiwa, 2016), Zambia (Kruse et al., 2009), Iraq (Al Dabbagh et al., 2019), West Bank and Gaza (Alshawish and Nairat, 2020), Cuba (Hernández, 2003), the Russian Federation (Seluch et al., 2021), and India (Pulagam and Satyanarayana, 2021). The geographical spread of the studies is illustrated in Figure 4.2. Each of the WHO regions were represented, with the greatest number (n=25) from the Americas region. Based on the World Bank 2020 Income Classification, 54 datasets in this review were from upper-middle-income countries, five were from lower-middle-income countries (Alshawish and Nairat, 2020; Kotb et al., 2014; Kruse et al., 2009; Mandengue et al., 2017; Pulagam and Satyanarayana, 2021), and

two were from low-income countries (Muliira and Ssendikadiwa, 2016; Selamu et al., 2019). There were 20 non-English studies, 11 of these were reported in Portuguese (Barbosa Ramos et al., 2019; das Mercedes et al., 2016; Filho et al., 2019; Holmes et al., 2014; Lima et al., 2017; Martins et al., 2014; Mercedes et al., 2017; Mota et al., 2014; Pinheiro et al., 2020; Silveira et al., 2014; Tomaz et al., 2020), eight in Spanish (Aguilera and de Alba García, 2010; Aranda et al., 2004; Aranda-Beltrán et al., 2005; Cetina-Tabares et al., 2006; Hernández, 2003; Hernández-Vargas et al., 2009; López-León et al., 2007; Maciel et al., 2018), and one in French (Mandengue et al., 2017).

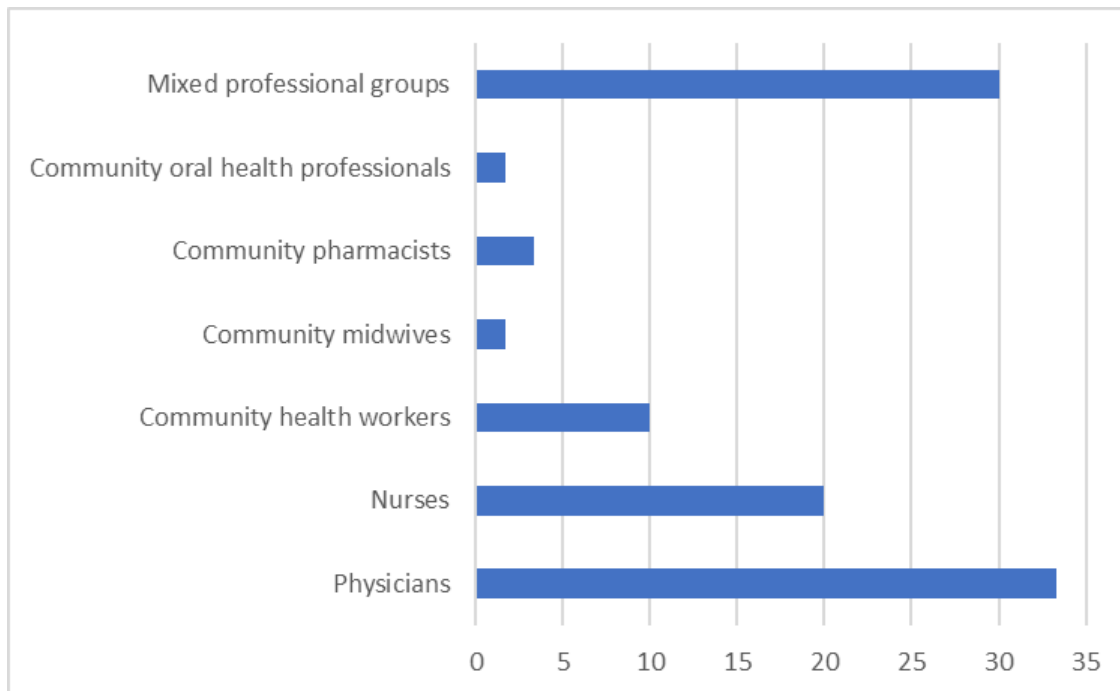
Figure 4.2 Geographical spread of studies



4.3.1.2 Study populations

Regarding the populations studied, 20 studies (33.3%) focused on primary care physicians; 12 (20.0%) on primary care nurses or nursing assistants (Alshawish and Nairat, 2020; Barbosa Ramos et al., 2019; das Mercedes et al., 2016; Engelbrecht et al., 2008; Garcia and Marziale, 2021; Holmes et al., 2014; Hu et al., 2015; Lorenz et al., 2018; Mercedes et al., 2020, 2017, 2016; Seluch et al., 2021); six (10.0%) on CHWs (Amiri et al., 2016; Bijari and Abassi, 2016; Malakouti et al., 2011; Martins et al., 2014; Mota et al., 2014; Pulagam and Satyanarayana, 2021); two (3.3%) on community pharmacists (Calgan et al., 2011; Okuyan et al., 2021); one (1.7%) each on community midwives (Muliira and Ssendikadiwa, 2016); and community oral health teams (Maciel et al., 2018). The remaining 18 (30.0%) were mixed populations of primary healthcare professionals (da Silva et al., 2021; Filho et al., 2019; Hernández, 2003; Hernández-Vargas et al., 2009; Kruse et al., 2009; Li et al., 2019; Lima et al., 2017; Lu et al., 2020; Mao et al., 2020; Pinheiro et al., 2020; Ran et al., 2020; Selamu et al., 2019; Silva and Menezes, 2008; Silveira et al., 2014; Tomaz et al., 2020; Wang et al., 2020; Xu et al., 2020; Yan et al., 2021). This is represented in Figure 4.3. The breakdown according to gender was reported in 54 studies, with women predominating in 44 studies, six of which were exclusively women. Mean age with standard deviation (SD), reported in 31 studies, ranged from 28 (SD 2.59) to 47 (SD 8.48) years.

Figure 4.3 Breakdown of studies by study population



4.3.1.3 Burnout measurement tools used

A detailed discussion of different burnout measurement tools, together with the justification for choosing to use the OLBI rather than the MBI in our research project, despite the popularity of the MBI, has been presented in Chapter 3. However, Table 4.3 summarises the main measurement tools used by the studies in this systematic review together with information on subscales and scoring methods.

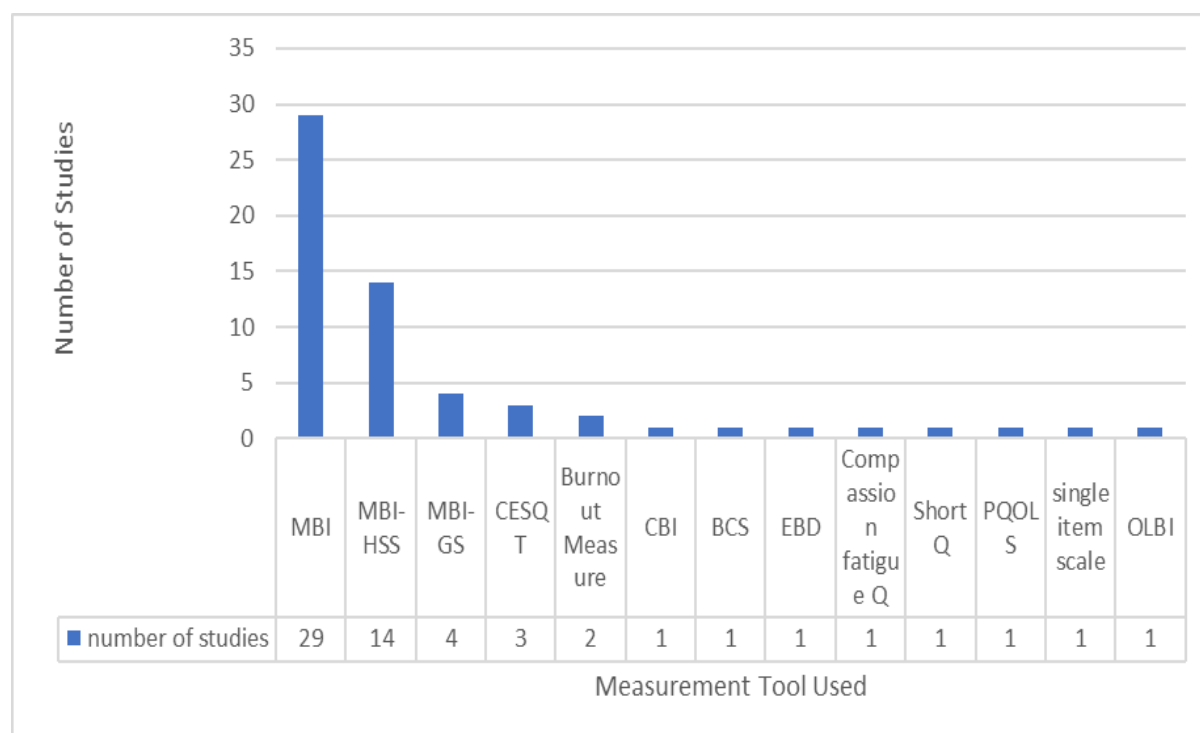
Table 4.3 Summary table of measurement tools and scoring methods

Measurement tool	Subscales	Scoring
MBI	3 subscales: - emotional exhaustion (EE) - depersonalisation (DP) - personal accomplishment (PA)	Definitions for overall burnout: - high scores in all 3 subscales - high scores in 2 subscales - high score in any subscale - Use of formula to combine subscale scores
CESQT	4 subscales: - lack of enthusiasm 'psychic wear' - apathy - guilt	2 profiles: - Profile 1 – high score in first 3 subscales but without guilt - Profile 2 – high scores in all subscales
Burnout Measure (BM) short version	Single scale consisting of 21 questions scored on a 7-point frequency scale	A single mean score is calculated
OLBI	2 subscales: - exhaustion - disengagement	- Scores combined: higher scores = greater degree of burnout - Mean question scores calculated
ProQOL and the Compassion Fatigue Questionnaire (CFQ)	3 subscales: - compassion satisfaction - compassion fatigue - burnout	Score generated for each separate subscale
Short questionnaire of burnout (SQB)	3 subscales: - antecedents of burnout - burnout - consequences of burnout	Mean scores in each subscale calculated
Single-item scale	Single question with 5 possible responses (1-5)	Selection of response 3, 4 or 5 categorised as burnout
Copenhagen Burnout Inventory (CBI)	3 subscales: - personal burnout - work-related burnout - client-related burnout	Average score calculated for each subscale
The Burnout Characterisation Scale (BCS)	3 subscales - emotional exhaustion - dehumanisation - disappointment at work	Score generated for each separate subscale
Emotional Burnout Diagnostics by Boyko V.V. (EBD)	Measures 3 stages of burnout development - tension - resistance - exhaustion	Score generated for each stage

The most commonly used burnout measurement tool was the MBI with 47 out of the 60 studies using a form of the MBI. Of the 47 studies that used the MBI, 29 did not specify

which version they used, 14 used the HSS version, and 4 used the GS version. The remaining 13 studies used a variety of other measurement tools. Three studies used the CESQT (Filho et al., 2019; Pinheiro et al., 2020; Silveira et al., 2014), two studies used the short version of the BM (Çevik and Ungan, 2021; Okuyan et al., 2021), and one each used the OLBI (Tomaz et al., 2020), the compassion fatigue questionnaire (CFQ) (Račić et al., 2019), the short burnout questionnaire (SQB) (Hernández, 2003), the ProQOL (Muliira and Ssendikadiwa, 2016), the CBI (Pulagam and Satyanarayana, 2021), the Burnout Characterisation Scale (BCS) (Garcia and Marziale, 2021), the Emotional Burnout Diagnostics by Boyko V.V. (EBD) (Seluch et al., 2021), and finally a validated single-item scale (Kruse et al., 2009). This is represented in Figure 4.4.

Figure 4.4 Measurement tools used by studies



A single, overall burnout prevalence estimate was reported by 43 studies. Within this group 31 used a version of the MBI (MBI – 20; MBI-HSS – 9; MBI-GS -2), three used the CESQT, and nine used tools which generate a single score without separate subscales. Amongst the studies that used the MBI, a total of five different methods for defining overall burnout were identified. The first method defines a high level of burnout as a high score in both the EE and DP subscales, plus a high score in the reversed PA subscale (Cetina-Tabares et al., 2006; das Mercedes et al., 2016; Gan et al., 2019; Mercedes et al., 2016). The second defines a high level of burnout as a high score in at least one of the three subscales when PA scores have been reversed (Aranda et al., 2004; Aranda-Beltrán et al., 2005; Lima et al., 2017; López-León et al., 2007; Martins et al., 2014), and thirdly, some studies defined a high level of burnout as a high score on at least two subscales, where the scores for PA had been reversed (Charoentanyarak et al., 2020; Holmes et al., 2014; Kotb et al., 2014). In addition, one study combined the subscale scores after reversing the PA scores and defined a low level of burnout as a score between 1 and 33, a moderate level of burnout as a score between 34 and 66, and a high level of burnout as a score between 67 and 99 (Al Dabbagh et al., 2019). Finally, two studies used the formula below, described previously and developed by Kalimo et al. (Kalimo et al., 2003) to calculate overall burnout (Lu et al., 2020; Xu et al., 2020).

$$\text{Burnout} = 0.4 \times \text{EE score} + 0.3 \times \text{DP score} + 0.3 \times \text{reversed PA score}$$

4.3.1.4 Survey methods used by studies

Burnout questionnaires were administered using several different methods. Most studies used paper questionnaires (n=24), a majority of which (n=22) were delivered and retrieved in person by researchers, either to workplaces or training events. One study posted the questionnaire to participants (Malakouti et al., 2011), and one did not report how they had

administered the paper questionnaire (Lorenz et al., 2018). Seven studies used interviews to administer their questionnaire (Ahmadpanah et al., 2015; Amiri et al., 2016; da Silva et al., 2021; das Mercedes et al., 2016; Kotb et al., 2014; Pulagam and Satyanarayana, 2021; Silva and Menezes, 2008). A further study gave participants the option of completing the questionnaire by interview or electronically (Ran et al., 2020), and another gave participants a choice between completing the questionnaire electronically or completing a paper copy and posting it (Račić et al., 2019). Six studies administered the questionnaire completely electronically (Çevik and Urgan, 2021; Charoentanyarak et al., 2020; Lu et al., 2020; Okuyan et al., 2021; Pinheiro et al., 2020; Xu et al., 2020). The mode of questionnaire administration was not clearly reported for the remaining 21 studies.

4.3.2 Risk of Bias

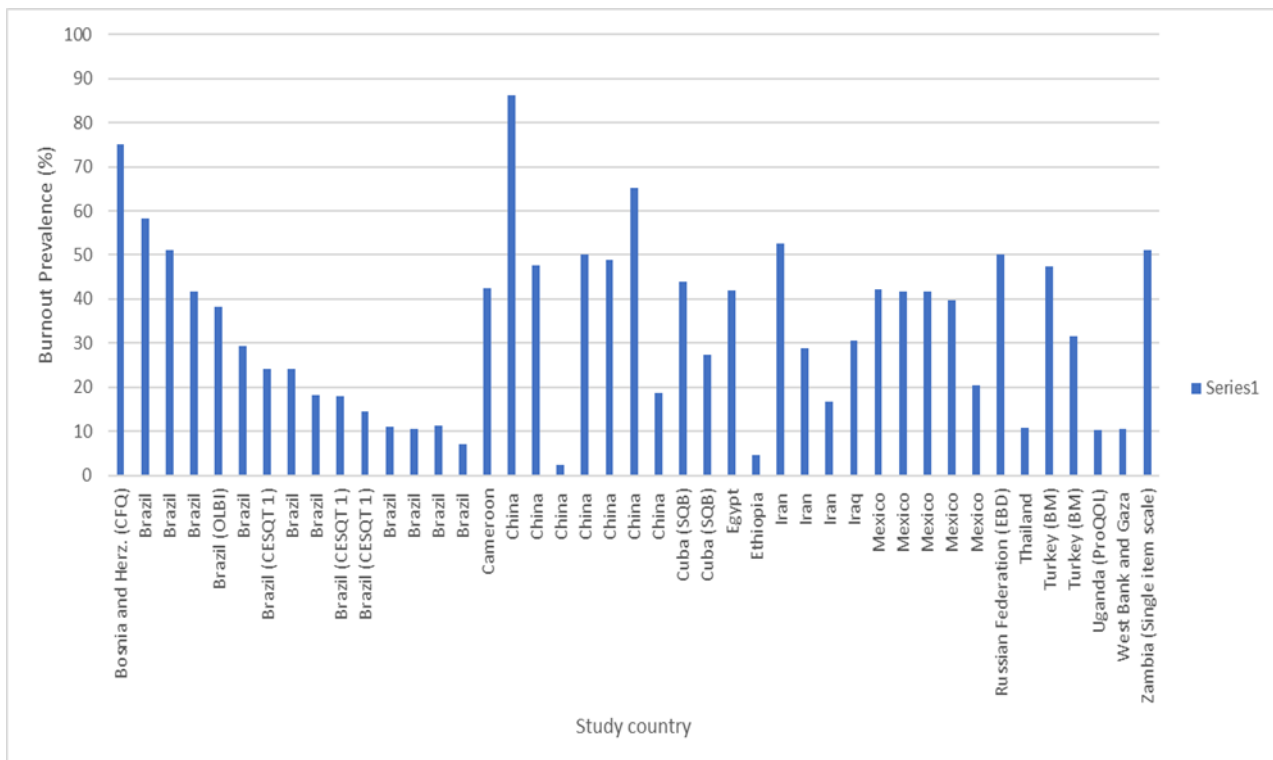
The risk of bias was calculated for each study, with 28 studies (46.7%) scoring between 5 and 7 points, indicating a moderate risk of bias, and 32 studies (53.3%) scoring between 8 and 10 points, indicating a low risk of bias. Most points lost were on the items relating to the external validity of the study, for example, whether the target population was representative of a wider population, whether the sampling frame was truly representative, and whether the sample was selected randomly. Only two studies lost points on items relating to the internal validity of the study. The first, because their definition of burnout was not clearly reported (Račić et al., 2019) and the second, because the numerator and denominator for burnout prevalence were not clearly reported (Lima et al., 2017). The full results are included in Appendix H.

4.3.3 Prevalence

4.3.3.1 Overall burnout prevalence estimates

In total, 43 studies stated a prevalence for overall burnout, either moderate burnout or severe burnout, using a variety of different measurement tools. Overall burnout prevalence estimates ranged from 2.46% for severe burnout among FPs in China (Gan et al., 2019), to a prevalence of 98.2% for combined moderate (87.9%) and severe (10.3%) burnout among community midwives in Uganda (Muliira and Ssendikadiwa, 2016). The first study used the MBI as their measurement tool and defined severe burnout as a high score in all three dimensions, the second study used the ProQOL. In the three studies that collected data during the COVID-19 pandemic, the prevalence ranged from 31.5% in community pharmacists (Okuyan et al., 2021), to 47.4% in family medicine residents (combined categories for severe and very severe burnout) (Çevik and Ugan, 2021), to 50% in primary care nurses (Seluch et al., 2021). The range of different overall burnout prevalence estimates, together with the countries where the studies were done and the measurement tool used in those studies that did not use the MBI, is illustrated graphically in Figure 4.5.

Figure 4.5 Prevalence estimates by country for moderate or high overall burnout - all measurement tools



4.3.3.2 Pooled prevalence estimates

Meta-analysis was conducted on 31 studies. Two of these were published during the COVID-19 pandemic, however, one collected data before the pandemic (Zhang et al., 2021) and one did not report dates for data collection (da Silva et al., 2021). These studies represent a total study population of 14,439. Pooled prevalence estimates were calculated for each score category (high, moderate, and low) in each subscale. The pooled prevalence for a high level of EE was 28.1% (95%CI 21.5 – 33.5) and for a moderate level, 27.6% (95%CI 21.1 – 33.0). For the DP subscale the pooled prevalence for a high level was 16.4% (95%CI 10.1 – 22.9) and for a moderate level, 22.7% (95%CI 15.2 – 29.7). For reduced PA, the pooled prevalence for a high level was 31.9% (95%CI 21.7 – 39.1) and for a moderate level, 28.1% (95%CI 18.5 – 35.3). Combining prevalence estimates for moderate and high levels on each subscale

resulted in a prevalence of 55.7% for EE; 39.1% for DP, and 60.0% for reduced PA. The full pooled prevalence results are presented in Table 4.4. The I^2 for these studies was 98% for the EE subscale and 99% for the DP and reduced PA subscales, indicating a high degree of heterogeneity. The forest plots, showing prevalence estimates for high levels of EE, DP, and reduced PA, are presented in Figures 4.6, 4.7, and 4.8, respectively.

Table 4.4 Pooled prevalence for each subscale

	Score on subscale	Pooled prevalence (%)	95% confidence interval (CI)
Emotional exhaustion (EE)	high	28.1	21.5 – 33.5
	moderate	27.6	21.1 – 33.0
	low	44.3	36.6 – 49.9
Depersonalisation (DP)	high	16.4	10.1 – 22.9
	moderate	22.7	15.2 – 29.7
	low	60.9	50.5 – 67.6
Reduced personal accomplishment (PA)	high	31.9	21.7 – 39.1
	moderate	28.1	18.5 – 35.3
	low	39.9	28.7 – 47.0

Figure 4.6 Forest plot showing prevalence of high scores on the MBI emotional exhaustion subscale

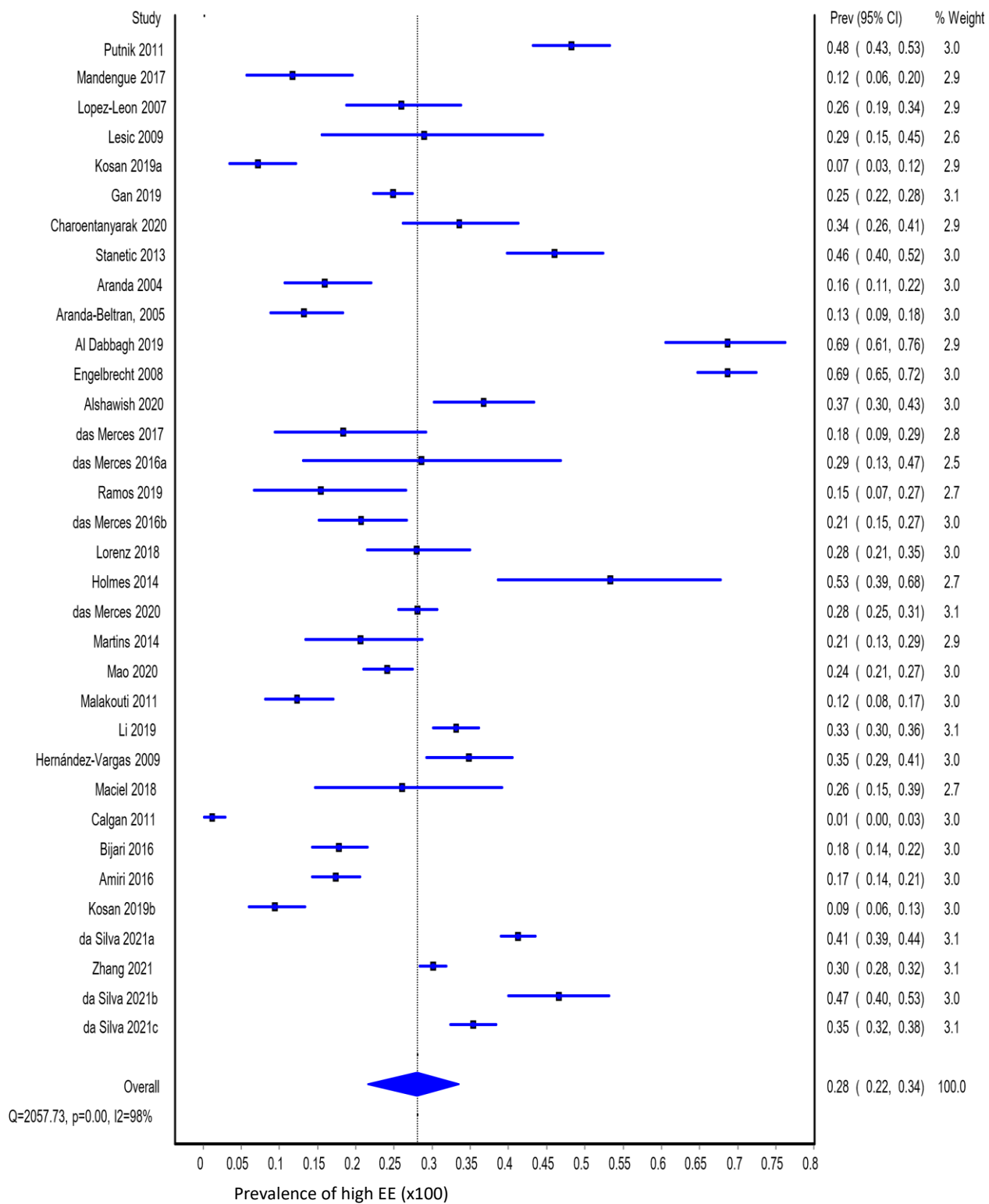


Figure 4.7 Forest plot showing prevalence of high scores on the MBI depersonalisation subscale

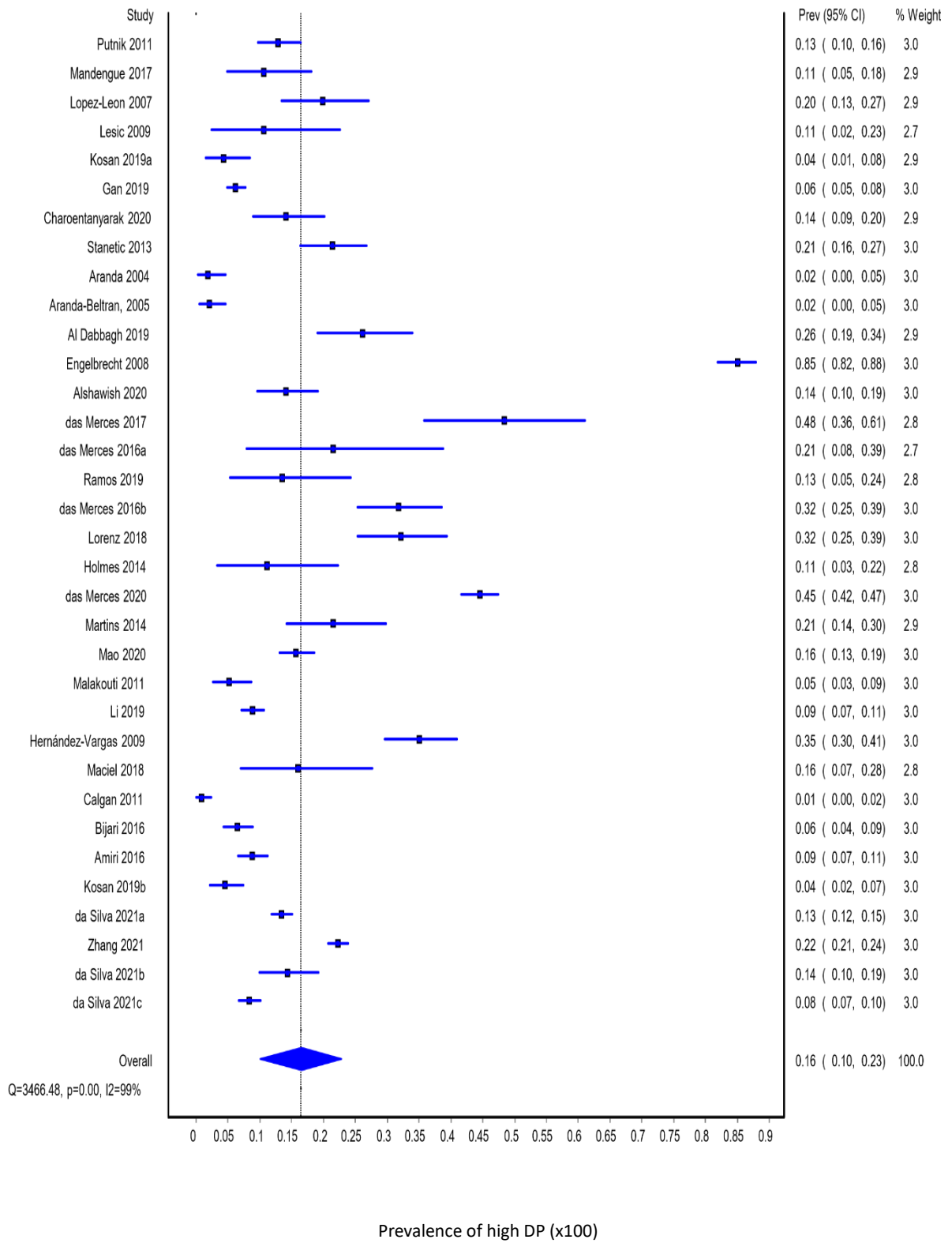
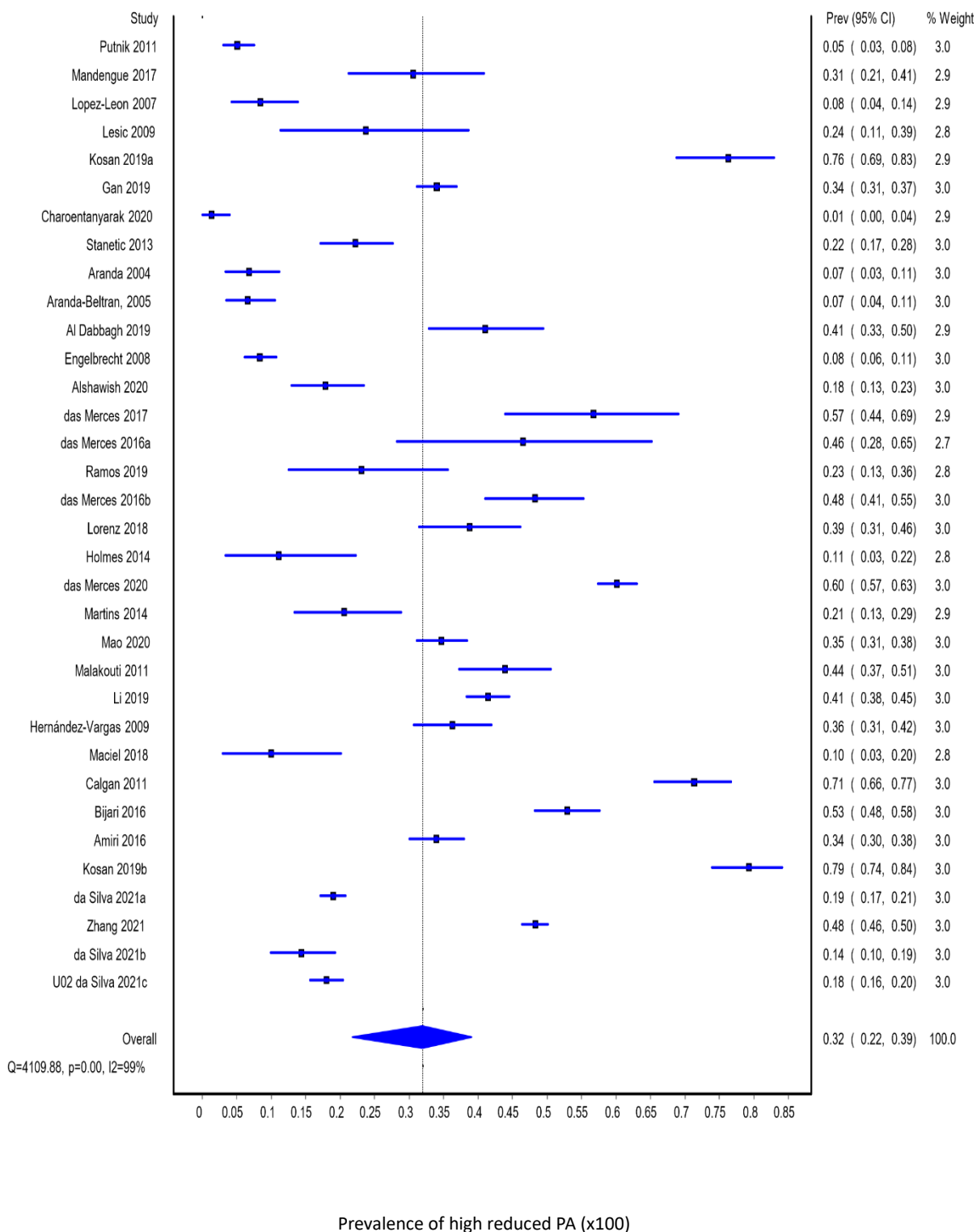


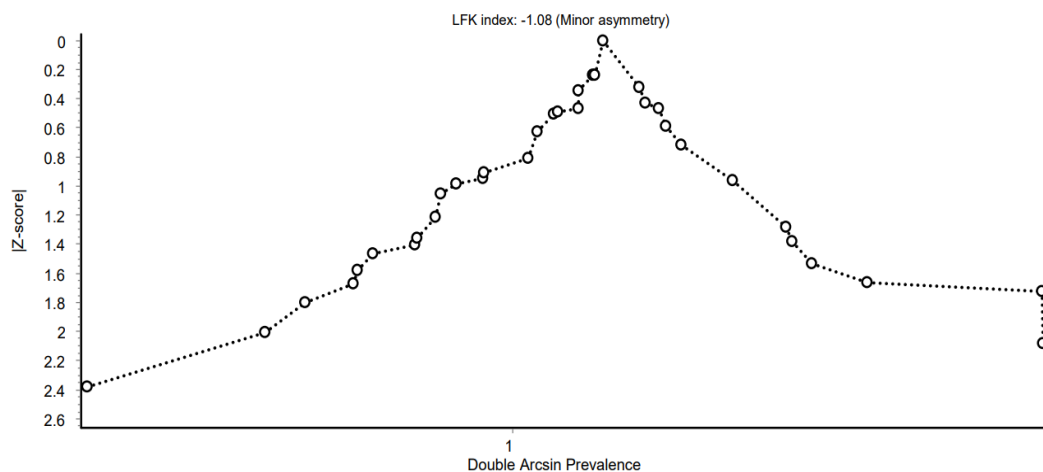
Figure 4.8 Forest plot showing prevalence of high scores on the reduced personal accomplishment subscale



4.3.4 Publication bias

Figure 4.9 shows the doi plot for high scores on the EE subscale. The asymmetry of the graph suggests that some publication bias is possible for this subscale, confirmed by an LFK index of -1.08. The LFK index was also calculated for high scores on the DP subscale, with a result of 0.37, and for high scores on the reduced PA subscale, with a result of -0.89. As an LFK index between -1 and +1 is indicative of symmetry these results suggest a low probability of publication bias for each of these subscales.

Figure 4.9 Doi plot for the prevalence of a high level of emotional exhaustion



4.3.5 Subgroup analysis of professional groups

The results of subgroup analysis showed that high scores for EE were most prevalent in the community nurse subgroup with a pooled prevalence of 33.1% (95%CI 22.7 – 44.0), followed by physicians with a pooled prevalence of 26.1% (95%CI 20.3 – 32.5), and then CHWs with a pooled prevalence of 21.3% (95%CI 9.3 – 34.8). DP was also most prevalent among community nurses with a pooled prevalence of 30.0% (95%CI 11.3 – 50.7), followed by physicians with a pooled prevalence of 11.5% (95%CI 7.8 – 16.0), and then CHWs with a

pooled prevalence of 10.0% (95%CI 6.3 – 14.5). In contrast, reduced PA was most prevalent for CHWs with a pooled prevalence for high scores of 33.5% (95%CI 19.2 – 48.7), followed by nurses with a pooled prevalence of 31.3% (95%CI 16.1 – 47.8), and then physicians, pooled prevalence 28.7% (95%CI 19.7 – 38.4). The forest plots for the subgroup analysis are presented in Figures 4.10 – 4.12.

Figure 4.10 Subgroup analysis - Forest plot showing prevalence of high scores on the emotional exhaustion subscale

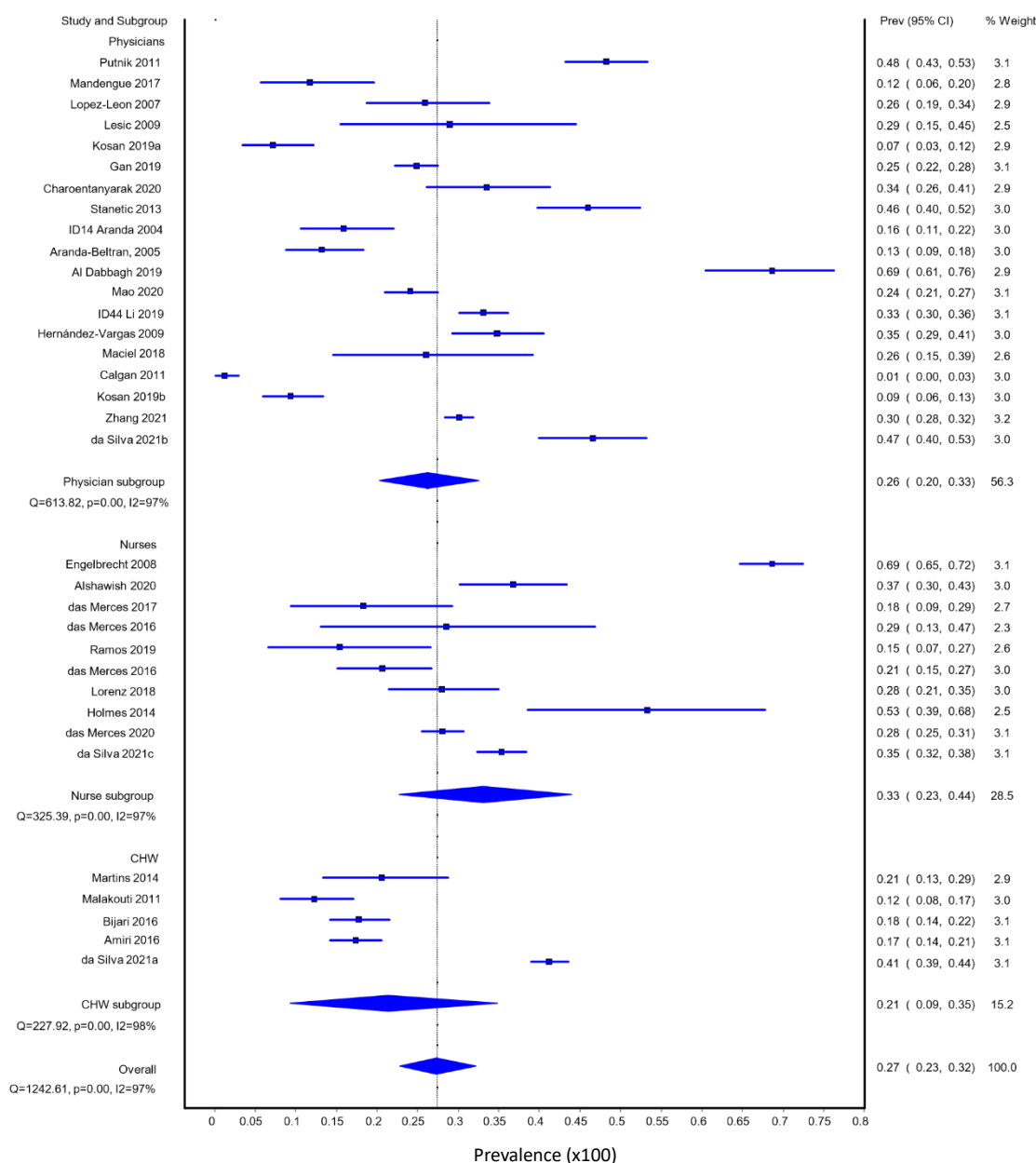


Figure 4.11 Subgroup analysis - Forest plot showing prevalence of high scores on the depersonalisation subscale

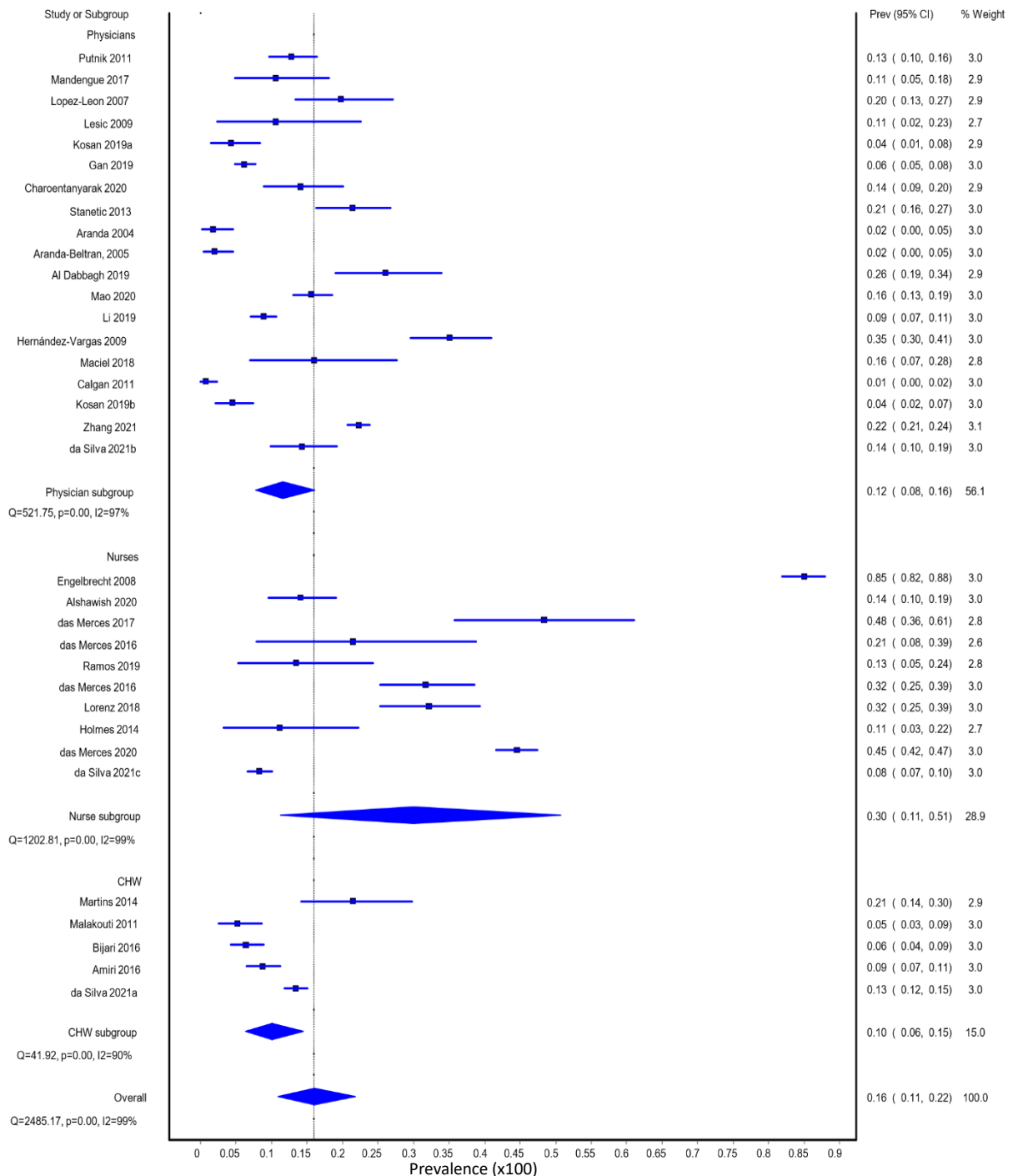
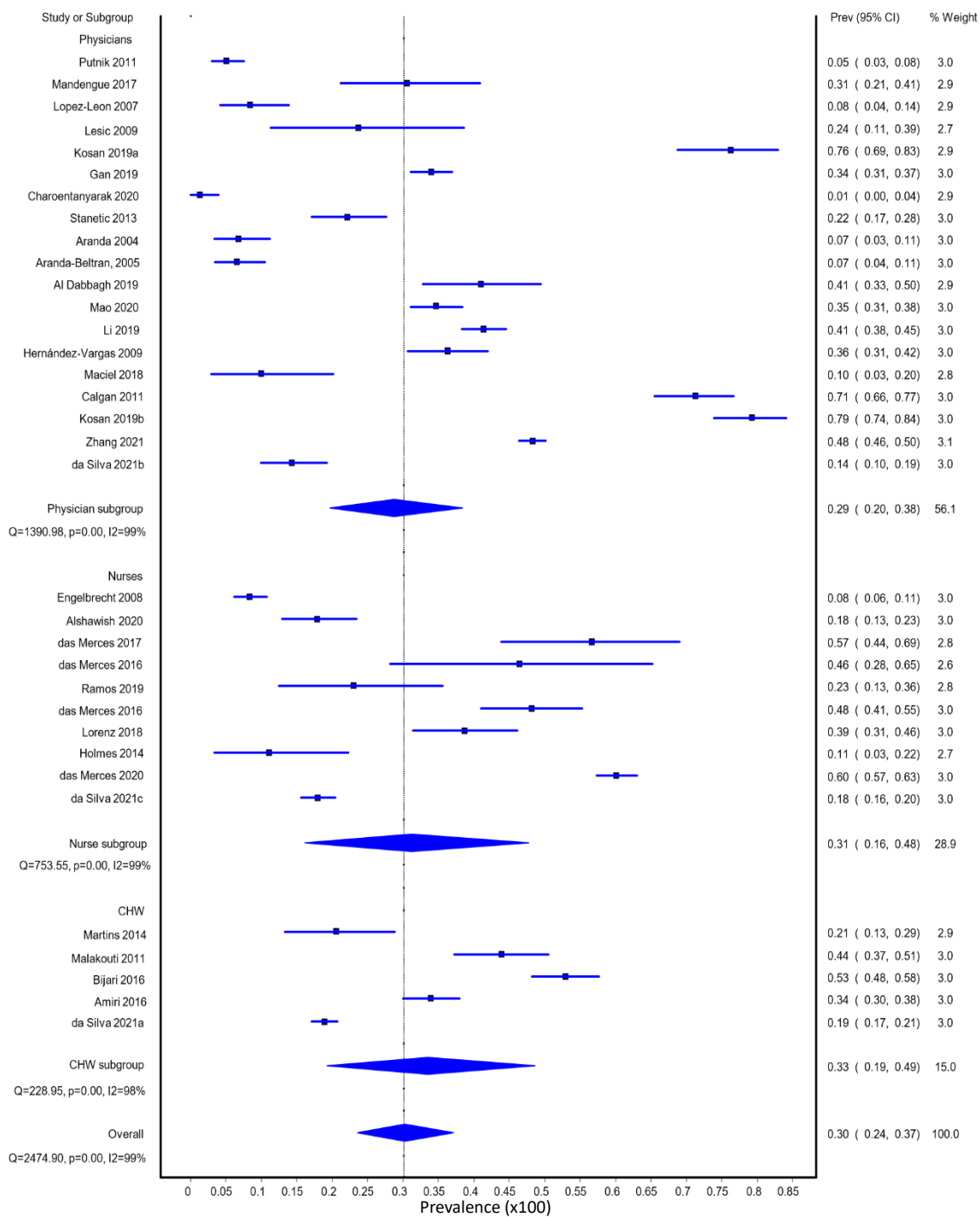


Figure 4.12 Subgroup analysis - Forest plot showing prevalence of high scores on the reduced personal accomplishment subscale



4.3.6 Separate analysis of subset of physician studies

4.3.6.1 Study characteristics

A total of 21 studies were identified that reported prevalence data for burnout in physicians. One of these studies included datasets from two different LMICs, Turkey and Bulgaria, resulting in 22 datasets (Soler et al., 2008). These 22 datasets represented 13 different LMICs (n=135) with five from Mexico (Aguilera and de Alba García, 2010; Aranda et al., 2004; Aranda-Beltrán et al., 2005; Cetina-Tabares et al., 2006; López-León et al., 2007), three from Turkey (Çevik and Ungan, 2021; Kosan et al., 2019; Soler et al., 2008), two each from Serbia (Lešić et al., 2009; Putnik and Houkes, 2011), China (Gan et al., 2019; Zhang et al., 2021), and Bosnia and Herzegovina (Račić et al., 2019; Stanetic and Tesanovic, 2013), and one each from South Africa (Rossouw et al., 2013), Cameroon (Mandengue et al., 2017), Egypt (Kotb et al., 2014), Thailand (Charoentanyarak et al., 2020), Bulgaria (Soler et al., 2008), Iraq (Al Dabbagh et al., 2019), Iran (Ahmadpanah et al., 2015), and Brazil (da Silva et al., 2021). Again, there were datasets from each of the six WHO regions, however there were only two datasets from the Africa region (Mandengue et al., 2017; Rossouw et al., 2013) and only one from South-East Asia (Charoentanyarak et al., 2020), the regions with greatest workforce shortages. There were two datasets from the Western Pacific region (Gan et al., 2019; Zhang et al., 2021), three from the Eastern Mediterranean (Ahmadpanah et al., 2015; Al Dabbagh et al., 2019; Kotb et al., 2014), six from the Americas (Aguilera and de Alba García, 2010; Aranda et al., 2004; Aranda-Beltrán et al., 2005; Cetina-Tabares et al., 2006; da Silva et al., 2021; López-León et al., 2007), and eight from Europe (Çevik and Ungan, 2021; Kosan et al., 2019; Lešić et al., 2009; Putnik and Houkes, 2011; Račić et al., 2019; Soler et al., 2008; Stanetic and Tesanovic, 2013). Sample sizes ranged from 31 to 2,693, with a total population included in

this synthesis of 7,186. A mean or median age was reported in 12 studies and ranged from a median of 28 years (range 24-54) (Çevik and Ungan, 2021) to a mean of 47 years (SD men = 10.15; SD women = 8.48) (Putnik and Houkes, 2011).

In terms of measurement tools used, 19 studies used the MBI, seven specified that they used the MBI-HSS version (Aguilera and de Alba García, 2010; Aranda et al., 2004; Charoentanyarak et al., 2020; Gan et al., 2019; Mandengue et al., 2017; Soler et al., 2008; Stanetic and Tesanovic, 2013), two used the MBI-GS (Putnik and Houkes, 2011; Zhang et al., 2021), and ten did not specify which version of the MBI they used. Two used a different measurement tool, one the CFQ (Račić et al., 2019), and the second the BM (short version) (Çevik and Ungan, 2021). Fourteen out of the 22 datasets reported a prevalence for overall burnout, and three different methods of combining the MBI subscale scores to define overall burnout were identified.

4.3.6.2 Risk of bias

The risk of bias scores for the physician studies ranged from a score of 6/10 to a score of 10/10. A total of eleven studies were assessed as moderate risk of bias and, ten studies were assessed as having a low risk of bias. As in the wider set of studies most points lost in this subset related to the external validity of the studies, more specifically, the generalisability of target population to wider population and/or the sampling methods.

4.3.6.3 Burnout prevalence for physician studies

In studies using the MBI as their measurement tool the prevalence of overall burnout ranged from 2.5% for severe burnout defined as a high score in all three subscales (Gan et al., 2019),

to 65.2% for burnout defined as a high score in any subscale (Zhang et al., 2021). Both studies were conducted in China. One study, conducted in Bosnia and Herzegovina and using the CFQ, simply reported a prevalence of 75% for ‘moderate burnout’ (Račić et al., 2019). As before datasets were only included in the meta-analysis if they used the MBI as their measurement tool and if they reported the prevalence of high, moderate, and low scores in each of the subscales. This resulted in 14 datasets included in the meta-analysis for a total study population of 5,819. The pooled prevalence for high EE was 28.6% (95%CI 20.3 – 36.2), and for moderate EE 24.6% (95%CI 16.9 – 32.0). For high DP, the pooled prevalence was 11.1% (95%CI 6.4 – 16.6) and for moderate DP 20.5% (95%CI 14.1 – 27.2). For high reduced PA, the pooled prevalence was 26.5% (95%CI 13.4 – 38.8), and for moderate reduced PA 18.9% (95%CI 7.9 – 30.5). Combining the pooled prevalence estimates for both moderate and high levels in each subscale resulted in a combined prevalence of 53.2% for EE, 31.6% for DP and 45.4% for reduced PA. Full results are presented in Table 4.5. The forest plots for high EE, DP, and reduced PA, are shown in Figures 4.13, 4.14 and 4.15, respectively. The heterogeneity (I^2) for the subscales ranged from 97 – 99%.

Table 4.5 Pooled prevalence for subscales in physician studies

	Score on subscale	Pooled prevalence (%)	95% confidence interval (CI)
Emotional exhaustion (EE)	high	28.6	20.3 – 36.2
	moderate	24.6	16.9 – 32.0
	low	46.8	37.0 – 54.6
Depersonalisation (DP)	high	11.1	6.4 – 16.6
	moderate	20.5	14.1 – 27.2
	low	68.4	59.8 – 75.0
Reduced personal accomplishment (PA)	high	26.5	13.4 – 38.8
	moderate	18.9	7.9 – 30.5
	low	54.7	37.1 – 66.2

Figure 4.13 Forest plot for high emotional exhaustion in physician studies

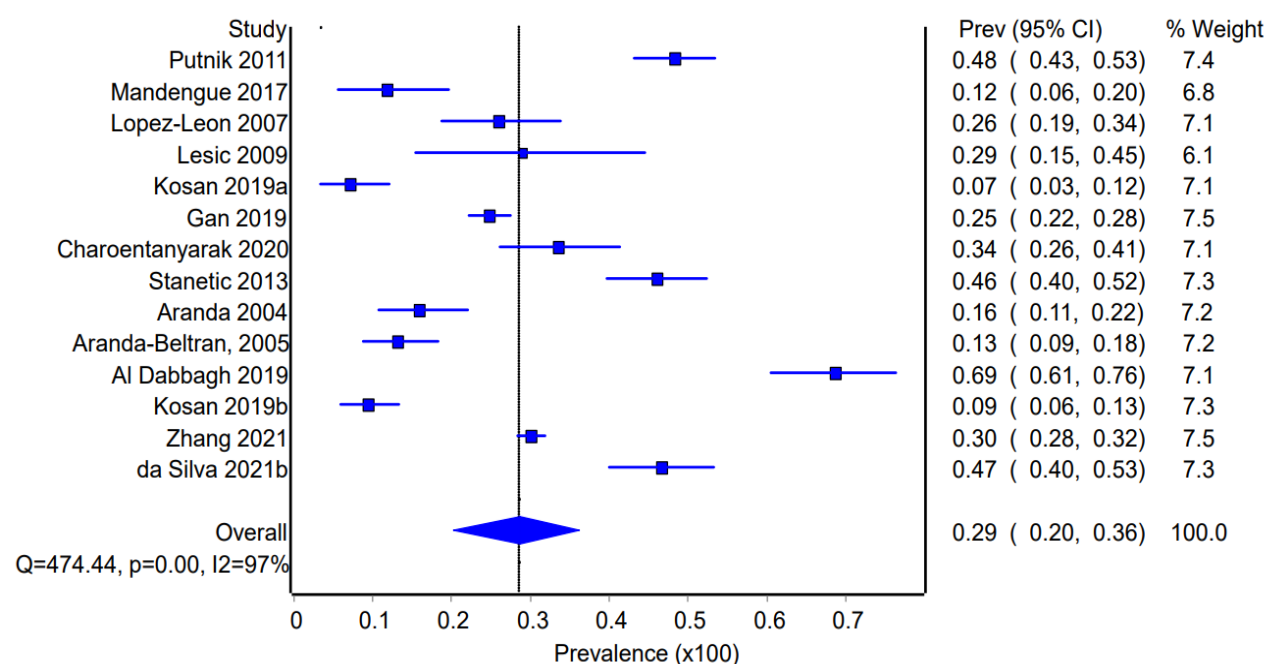


Figure 4.14 Forest plot for high depersonalisation in physician studies

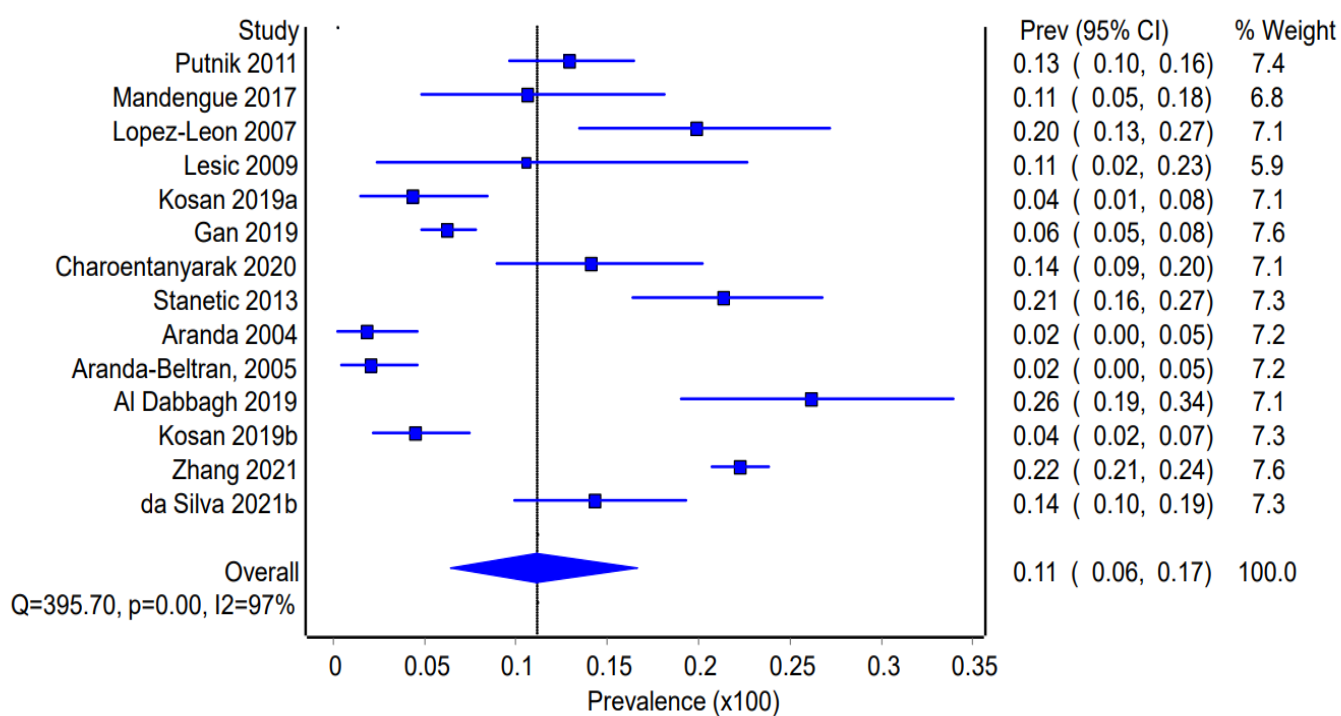
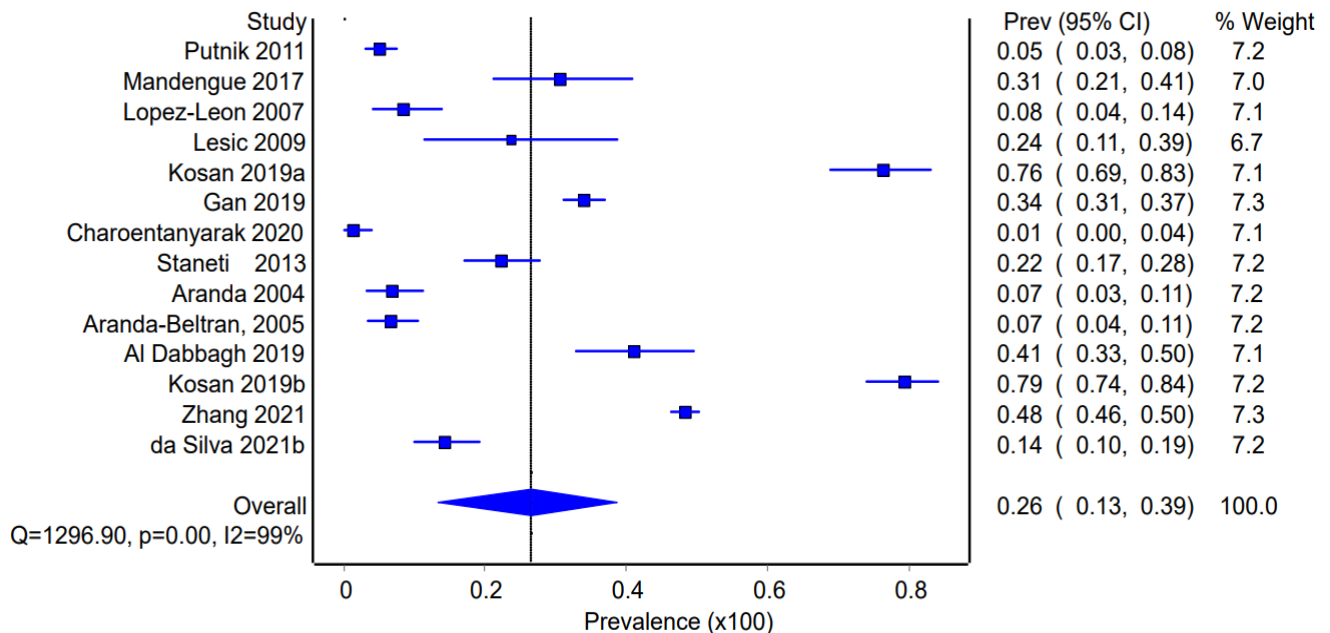


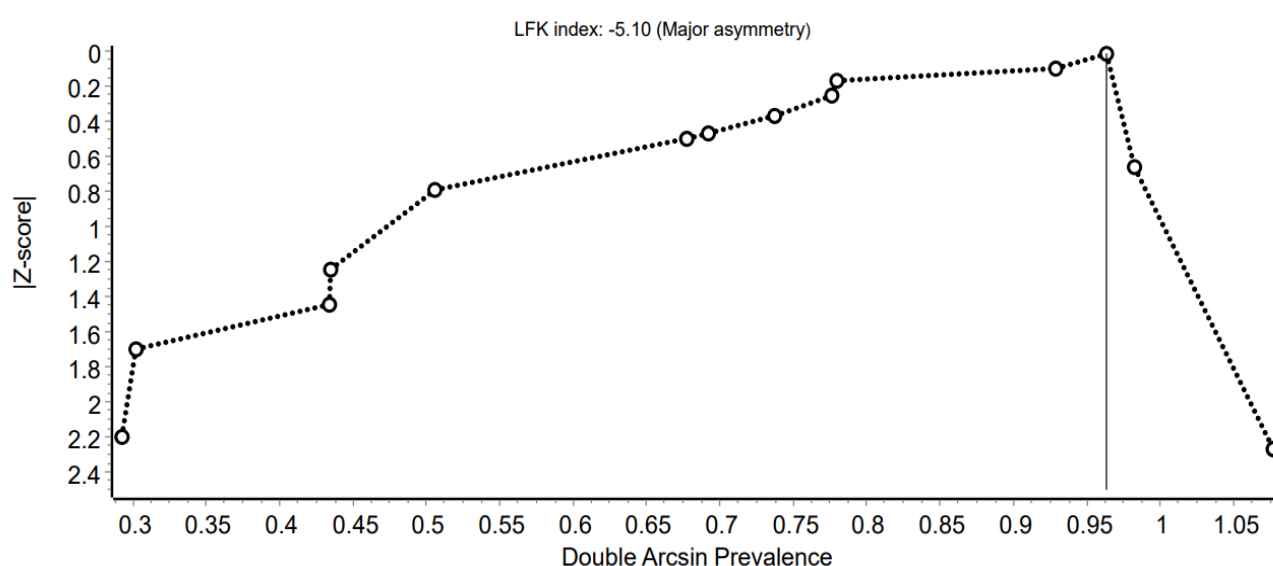
Figure 4.15 Forest plot for high reduced personal accomplishment in physician studies



4.3.6.5 Publication bias

The doi plots for the subset of physician studies were not all symmetrical indicating the possibility of publication bias. LFK indexes for each subscale ranged from -5.10 for high DP and -2.95 for high reduced PA, both of which are indicative of significant asymmetry and the possibility of a negative publication bias, to -0.76 for high EE, indicating symmetry and a low likelihood of publication bias. Figure 4.16 shows the doi plot for high DP, demonstrating asymmetry. Given the asymmetrical results for high DP and high PA, there is the possibility of publication bias in this subset of studies although asymmetry can also be caused by other forms of bias and heterogeneity and may occur by chance (Furuya-Kanamori et al., 2018).

Figure 4.16 Doi plot for high DP (physician studies)



4.3.7 Associated Factors for all groups of primary care professionals

Several demographic factors were found to be significantly associated with burnout. Findings according to sex were conflicting. Six studies found that men had a higher prevalence of burnout than women (Li et al., 2019; Lu et al., 2020; Mao et al., 2020; Martins et al., 2014; Soler et al., 2008; Xu et al., 2020), while nine found that the prevalence was higher in women (Aguilera and de Alba García, 2010; Amiri et al., 2016; Çevik and Ungan, 2021; Kruse et al., 2009; Mercedes et al., 2020; Okuyan et al., 2021; Putnik and Houkes, 2011; Selamu et al., 2019; Tomaz et al., 2020), and three found no significant gender differences (Gan et al., 2019; Kotb et al., 2014; López-León et al., 2007). Ten studies found age to be significantly negatively associated with burnout, with younger age groups having a higher prevalence of burnout (Al Dabbagh et al., 2019; da Silva et al., 2021; Kosan et al., 2019; Kotb et al., 2014; Kruse et al., 2009; Lu et al., 2020; Martins et al., 2014; Okuyan et al., 2021; Soler et al., 2008; Xu et al., 2020). In the four studies that found increased age to be associated with increased burnout

there was a specific association with high scores in the EE subscale (Amiri et al., 2016; Bijari and Abassi, 2016; Selamu et al., 2019; Stanetic and Tesanovic, 2013). Two studies reported no significant association between burnout and age (Gan et al., 2019; Lešić et al., 2009). Marriage was found to be positively associated with burnout in four studies (Hu et al., 2015; Kotb et al., 2014; Muliira and Ssendikadiwa, 2016; Tomaz et al., 2020), and four studies found that having children was positively associated with burnout (Aguilera and de Alba García, 2010; Bijari and Abassi, 2016; Mandengue et al., 2017; Tomaz et al., 2020). In contrast, eight studies found a positive association between unmarried status and burnout (Al Dabbagh et al., 2019; Aranda et al., 2004; Aranda-Beltrán et al., 2005; Calgan et al., 2011; Çevik and Ungan, 2021; Gan et al., 2019; Lu et al., 2020; Xu et al., 2020), and two studies found that not having children was associated with higher levels of burnout (Çevik and Ungan, 2021; Silveira et al., 2014).

High workload, including overtime, shift-work, and patient load, was found to be significantly associated with high levels of burnout (Aguilera and de Alba García, 2010; Aranda et al., 2004; Barbosa Ramos et al., 2019; Calgan et al., 2011; Çevik and Ungan, 2021; Engelbrecht et al., 2008; Kotb et al., 2014; Li et al., 2019; López-León et al., 2007; Lu et al., 2020; Mandengue et al., 2017; Mao et al., 2020; Mercedes et al., 2020; Pulagam and Satyanarayana, 2021; Račić et al., 2019; Rossouw et al., 2013; Silveira et al., 2014; Soler et al., 2008; Xu et al., 2020), and in addition, three studies found that working a second job was positively associated with burnout (Barbosa Ramos et al., 2019; Kruse et al., 2009; López-León et al., 2007). Conflict at work, with both colleagues and patients, and exposure to violence at work were also significantly associated with burnout (Charoentanyarak et al., 2020; Engelbrecht et al., 2008; Gan et al., 2019; Hu et al., 2015; López-León et al., 2007; Mandengue et al., 2017; Mercedes et al., 2020). Regarding years of service, 11 studies found a positive association with burnout (Aguilera and de Alba García, 2010; Aranda-Beltrán et al., 2005; Bijari and Abassi,

2016; da Silva et al., 2021; Hu et al., 2015; Malakouti et al., 2011; Mao et al., 2020; Mercedes et al., 2020; Pulagam and Satyanarayana, 2021; Silveira et al., 2014; Stanetic and Tesanovic, 2013), and five studies found a negative association, i.e., prevalence of burnout decreased as years of service increased (Alshawish and Nairat, 2020; Calgan et al., 2011; Lima et al., 2017; Okuyan et al., 2021; Rossouw et al., 2013).

Other factors associated with an increased risk of burnout included rural, community based, or economically deprived residence or work setting (da Silva et al., 2021; Martins et al., 2014; Mercedes et al., 2020; Račić et al., 2019; Selamu et al., 2019), lack of support (Hernández-Vargas et al., 2009; Li et al., 2019; Mao et al., 2020), level of education (Aranda et al., 2004; Aranda-Beltrán et al., 2005; Bijari and Abassi, 2016; Hu et al., 2015; Li et al., 2019; Lu et al., 2020; Mao et al., 2020; Xu et al., 2020), job insecurity (Hernández-Vargas et al., 2009; Pulagam and Satyanarayana, 2021; Selamu et al., 2019), a lack of resources at work or adequate workspace (Amiri et al., 2016; Engelbrecht et al., 2008; López-León et al., 2007; Mercedes et al., 2020), exposure to COVID-19 (Çevik and Urgan, 2021), inadequate personal protective equipment (Çevik and Urgan, 2021), and co-existing physical or psychological illness (Al Dabbagh et al., 2019; Alshawish and Nairat, 2020; Bijari and Abassi, 2016; Martins et al., 2014; Muliira and Ssendikadiwa, 2016; Račić et al., 2019). Three studies found that smoking was positively associated with burnout (Al Dabbagh et al., 2019; Mercedes et al., 2020; Soler et al., 2008), whereas one study found a negative association between smoking and burnout (Kotb et al., 2014). Turnover intention was positively associated with burnout in four studies (Lorenz et al., 2018; Ran et al., 2020; Soler et al., 2008; Wang et al., 2020). Distance travelled to work (Mandengue et al., 2017) and being asked to complete work tasks outside of the individual's expertise (Muliira and Ssendikadiwa, 2016) were unique to low-income or lower-middle-income countries. Protective factors included exercise (Kotb et al., 2014; Mercedes et al., 2020), job satisfaction (Cetina-Tabares et al., 2006; Gan et al., 2019; Lima et al.,

2017; Soler et al., 2008), regular vacation time (Kosan et al., 2019), and rest breaks (Merces et al., 2020).

4.4 Discussion

Prevalence of burnout

Prevalence estimates for overall burnout vary widely, both between countries and within countries. The lowest point prevalence estimate for overall burnout in this review is 2.46% for severe burnout in FPs in China, using the MBI and defining severe burnout as a high score in each subscale (Gan et al., 2019). The highest is 98.2% for combined moderate and high levels of burnout, among midwives in Uganda, using the ProQOL (Muliira and Ssendikadiwa, 2016). Brazil, the country that contributed the most studies to this review demonstrates significant within country variability with prevalence estimates ranging from 7.1%, using the MBI and defining burnout as high scores on all three subscales (Merces et al., 2016), to 58.3% also using the MBI but defining burnout as high scores on at least one subscale (Merces et al., 2017). Variability is also high with measurement tools other than the MBI. For example, estimates for studies using the CESQT range from 8.5% (Filho et al., 2019) to 44.5% (Pineiro et al., 2020). Both studies are conducted in Brazil on mixed populations of primary healthcare professionals. Figure 4.5 (section 4.3.3.1) clearly illustrates the wide differences in overall burnout prevalence estimates, and the substantial variations in within country estimates.

It is noteworthy that Gan et al. (2019), despite defining severe burnout (prevalence of 2.46%) as a high score in all dimensions, also presented prevalence estimates of 21.0% for a high score in 2 dimensions, and 35.0% for a high score in at least one dimension. Furthermore, Pineiro et al. (2020), using the CESQT, estimates a prevalence of 14.4% for Profile 1 and a

prevalence of 44.5% for Profile 2 for the same study population. These two studies illustrate the impact that different definitions of burnout have on prevalence estimates, even within the same study population. Such marked differences in prevalence, depending on the definition used, highlight the research challenges posed by such a variety of different measurement tools and definitions of burnout and emphasise the difficulties inherent in making any comparisons of overall burnout, even between studies in the same country that use the same measurement tool. One possible solution for this would be the development and agreement of an internationally recognised standard for the measurement of burnout.

The pooled prevalence results confirm high levels of burnout among primary care professionals in LMICs with a pooled prevalence of 28.1% for high levels of EE, 16.4% for high levels of DP, and 31.9% for low PA. Furthermore, pooled prevalence for moderate EE of 27.6%, moderate DP of 22.7%, and moderate reduced PA of 28.1%, mean that when moderate and high prevalence estimates are combined for each subscale, over half of the studied population score either moderate or high for EE (55.7%) and reduced PA (60.0%) and over a third score either moderate or high for DP (39.1%). This is perhaps unsurprising given the combination of high burdens of disease with workforce and resource shortages in LMICs (Campbell et al., 2013; Crisp, 2011; WHO, 2016, 2019b). It was not possible to compare prevalence findings from the three studies conducted during the COVID-19 pandemic with the pooled pre-pandemic results as different measurement tools were used. However, the estimated burnout prevalence in two of these studies (Okuyan et al., 2021; Seluch et al., 2021) was in line with findings from a global survey of health-care professionals conducted during the pandemic and using a single-item scale to measure burnout, which found a pandemic burnout prevalence of 51% (Morgantini et al., 2020), higher than our pooled estimates for each subscale.

Pooled prevalence for the FP subgroup of 26.2% for high EE, 11.5% for high DP, and 28.7% for high reduced PA are comparable to those found for FPs in other international studies conducted mainly in HICs. A cross-cultural study in Jamaica and Canada found the prevalence of high EE, DP, and reduced PA to be 34%, 20%, and 38% respectively in FPs, slightly higher than our results (Brown et al., 2019). However, an international European study on FPs demonstrated considerable variability between countries, finding the prevalence for those HICs included in the study ranged from 30.2 – 54.3% for high EE; 12.0 – 73.3% for high DP; and 11.9 – 93.2% for high reduced PA (Soler et al., 2008).

Results for the subgroup of community nurses of a pooled prevalence for EE of 33.1%, for DP of 30.0%, and for reduced PA of 31.3% are also comparable with other studies. A previous meta-analysis of primary care nurses, performed on 8 studies, 6 of which were set in HICs, found similar levels of EE, and reduced PA to those found by our study, but a lower prevalence of DP (15%) (Monsalve-Reyes et al., 2018). This difference in prevalence of DP may reflect differences in the responsibilities, workload and type of work expected of primary care nurses in LMICs where they are often the main provider of primary care (Arya et al., 2017).

Notably, reduced PA is the most prevalent dimension of burnout for CHWs and physicians, and this differs from findings in HICs where EE is often the most prevalent dimension (Soler et al., 2008). Participation in further education to facilitate career progression has been identified as an important, protective, coping strategy in qualitative studies in LMICs (Selamu et al., 2017). Therefore, perhaps a high prevalence of reduced PA reflects limited opportunities for further education, professional development, and career progression in LMICs as compared to HICs. Furthermore, Raviola (2015) suggests that the lack of resources and high disease burdens in sub-Saharan Africa leads to a sense of demoralisation and

reduced professional competence. This may contribute to this finding of a high prevalence of reduced PA where these conditions exist. However, the pooled prevalence for high reduced PA of 26.2% in the physician subgroup is lower than the overall prevalence of this in the wider LMIC primary healthcare professional population. Given the findings of Selamu et al. (2017), that opportunities for further education may be protective, this perhaps reflects greater opportunities for professional development and access to further education in the physician group relative to other primary healthcare professionals in LMICs.

The least prevalent dimension is DP. This differs again from some findings in HICs (Brown et al., 2019; Hussein et al., 2015; Soler et al., 2008). Findings from studies in FPs in European countries are variable but in nine high-income European countries DP was found to be the most prevalent or second most prevalent dimension and in all these countries the prevalence is higher than our pooled results (Soler et al., 2008). Kristensen and colleagues (2005) suggest that DP develops as a coping strategy in response to EE and it may be that differences in coping strategies between different cultures go partway towards explaining differences between countries for the prevalence of DP. Wendland observes, in her ethnography of medical students and young doctors in Malawi, that, despite describing their working conditions as 'dehumanising' and acknowledging high levels of fatigue, there is little in the way of emotional distancing or cynicism towards their patients (Wendland, 2010). This contrasts with North American medical students and may reflect cultural differences in burnout between collectivist and individualist cultures (Wendland, 2010). The pooled prevalence for high DP was markedly lower in both the physician subgroup and the CHWs subgroup than in the community nurse subgroup. This is difficult to explain, although differences in training and autonomy may account for some of the difference.

The pooled prevalence for high EE (26.2%) in the subgroup of physician studies was similar to the pooled prevalence for the broader population of primary care professionals and suggests that just over 1 in 4 FPs working in LMICs is experiencing high levels of emotional exhaustion. High workloads across all cadres of primary healthcare professionals coupled with a lack of resources are likely contributory factors. However, this prevalence is slightly lower than that found in the European HICs mentioned previously. Overall, the pattern of burnout appears to differ in some HICs from these LMIC results. This may reflect differences not only in how burnout is experienced across cultures but also in coping strategies and the relative impact of different associated factors. More research is necessary to explore these differences.

Associated factors

The evidence for an association of burnout with gender across all primary care professional groups is conflicting, with nine studies finding a higher prevalence in women, while in contrast six studies found a higher prevalence in men. This lack of clarity may be partially explained by the results of a meta-analysis of gender differences in burnout which found that women are more likely to be emotionally exhausted while men are more likely to experience depersonalisation (Purvanova and Muros, 2010). It concluded that men and women experience burnout differently and that unidimensional measures of burnout that are reliant on measuring EE as the core dimension of burnout may over-diagnose women and under diagnose men. Cultural differences in gender roles may also play a part with women in many cultures having greater home and family responsibilities in addition to their work (Putnik and Houkes, 2011). Furthermore, the importance of protective factors such as social support may differ between collectivist and individualist cultures (Pines et al., 2002) and between genders. A study in India, a collectivist culture, found that the perceived helpfulness of social support was protective for burnout and that this association was stronger in men than in

women (Brown et al., 2003). A higher prevalence of burnout among women in some countries may also reflect the increasing feminisation of occupations within primary healthcare (WHO, 2016).

The evidence for an association with age is a little clearer with ten studies finding an association between burnout and younger age groups. This may be because younger professionals have greater family responsibilities leading to increased work/home conflict and indeed four studies found an association between having children and burnout, although the evidence for an association with marital status was conflicting. Younger, early career professionals may also lack self-efficacy, and feelings of competence, resulting in a higher risk of burnout. This risk decreases as they become more established in their careers and their feelings of competence grow (Cherniss, 1993). Survival bias may also influence these findings as those vulnerable to burnout may leave the profession earlier in their careers, leaving behind those less affected by burnout (Maslach et al., 2001)

A higher prevalence of burnout in younger professionals, suggests that prevalence might decrease with increasing years of service but in fact this is not supported by the findings of this systematic review. Eleven studies found that the prevalence of burnout increased with years of service, and only five found to the contrary. This contrasts with previous, mainly HIC, research (Maslach et al., 2001) and may reflect limited opportunities in LMICs for advancement and career development leading to frustration and burnout as years of service increase. However, further research would be invaluable to fully elucidate the reasons for this difference. Although four studies found an increased risk of burnout in the older age groups, this was specifically seen with the EE subscale suggesting that emotional exhaustion may, in some cases, increase with both age and years of service.

The evidence in this review confirms the established associations of burnout with high workloads, including overtime, shift work, and working a second job; lack of resources at work and poor workspace; lack of support at work; and conflict at work (Maslach et al., 2001). Interventions specifically developed to target these areas may significantly improve working conditions and reduce the risk of burnout in primary care professionals although more work needs to be done to establish the most significant associated factors for each cadre of primary care professionals as work environments and expectations will differ according to role. A small number of studies identified the protective factors of regular exercise, regular breaks at work and regular vacation time, all of which could be incorporated into workplace cultures.

Previous research has found burnout to be a significant predictor of a variety of both physical and psychological illness including cardiovascular and musculoskeletal disorders, type 2 diabetes, headaches, respiratory and gastrointestinal illnesses, fatigue, insomnia, and depressive symptoms (Salvagioni et al., 2017). In line with this, six studies found a statistically significant association of burnout with physical and psychological illness. This association may lead to increases in sick leave and absenteeism amongst healthcare professionals and has implications for staffing levels (Anagnostopoulos and Niakas, 2010; Toppinen-Tanner et al., 2005) which may already be low in LMICs given workforce shortages.

Distribution of studies

The geographical spread of these studies is noteworthy and highlights the dearth of primary care burnout research in LMICs. The WHO regions with the greatest shortages of healthcare professionals, South-East Asia, and Africa (WHO, 2016), are poorly represented with only six studies from the Africa region and two from South-East Asia. This may be because in many African and South-East Asian countries family medicine is not a well-established speciality

and therefore research interests are focused elsewhere. It may also reflect difficulties in obtaining funding for primary care focused research in these countries. However, given the importance of the role of primary care in achieving UHC, more research is urgently needed to establish the burden of burnout amongst primary care professionals in these regions as large populations, high burdens of disease, and shortages of healthcare professionals suggest that the burden of burnout may be considerable. This paucity of research is even more marked in the subset of physician studies with a total of only three studies from the two regions of South-East Asia and Africa, highlighting the need for more research into burnout in this specific group of primary care professionals. Most studies were conducted in upper-middle-income countries (54 datasets) emphasising the need for further research in low-income and lower-middle-income countries, where both workforce and resource shortages are likely to be greatest. It is noteworthy that 43% of the studies in this review are recent studies, published since 2019, suggesting recognition of the importance of this area of research and increased interest in researching burnout in primary care professionals in LMICs. This may be partly due to a growing awareness of the value of primary care, and the necessity of a healthy primary care workforce, for achieving UHC.

Survey methods used

Notably, the eight studies that either administered their questionnaire completely electronically or gave an electronic option were all published in either 2019 or 2020, with data collections being carried out from 2017 to 2019. This perhaps implies increasing willingness to use technology to administer questionnaires although it is difficult to conclude this with any certainty as most studies still used the more traditional paper questionnaires either delivered in person or by post.

Heterogeneity of studies

Study heterogeneity was high in this review. There are several factors which contribute to this including the breadth of primary care professionals included, both in the review and in the individual studies. Although this review included studies of different primary care professionals such as nurses and physicians, sixteen of the studies were themselves on mixed populations of primary care staff. This introduces a wide variety of working patterns, expectations, and workplace characteristics as well as educational backgrounds. However, heterogeneity is also high in the subgroups of community nurses and FPs suggesting that other causes of heterogeneity such as study setting, and methodology are also significant.

Another contributor to the degree of heterogeneity is the variety of burnout measurement tools available and the lack of clear diagnostic criteria for burnout. Even when the MBI is used there is still little consensus on whether, or indeed how, the subscales may be combined to give an overall burnout score, and a decision must be made as to whether to try to combine the subscales or simply report results for the three separate dimensions. There are also differences in the cut-off points used to define low, moderate, and high levels on each subscale. This lack of consensus on the definition, diagnosis, and classification of burnout makes pooling prevalence for overall burnout prevalence problematic which is why pooled prevalence was only calculated for separate MBI subscales. However, due to differences in the interpretation of subscale scores generated by the MBI, with different cut-off scores defining the categories of low, moderate, and high burnout, some methodological heterogeneity may persist even when analysis is limited to separate subscale scores in only those studies using the MBI.

The geographical spread of the studies also introduces heterogeneity as the studies encompass a variety of cultures, politics, economies, disease burdens, educational, and health systems. This will lead to differences in workload, resource availability, and training,

and may contribute to substantial differences in working environment and in personal coping strategies, between countries. Although our study will be conducted across a variety of geographical and cultural settings the use of the same burnout measurement tool, with results interpreted consistently across countries, will afford a much better opportunity to compare burnout across different countries than the literature currently allows.

4.5 Strengths and limitations

This review was conducted using robust systematic review methodology which includes a comprehensive search strategy in nine databases, and independent screening and data extraction by paired, independent reviewers. In addition, the study protocol and the search strategy were developed in collaboration with senior researchers and a systematic review expert, and the protocol was pre-registered on the PROSPERO website, ensuring transparency.

The inclusion of non-English language studies is a particular strength of this review. Despite recommendations to the contrary, language limitations are common practice in systematic review searches with a recent study of 250 systematic reviews finding that 34% applied explicit language restrictions to their searches and only 7.6% actually included non-English language articles (Jackson and Kuriyama, 2019). However, this search limitation can introduce language bias which is particularly relevant in global health research (Stern and Kleijnen, 2020). Language bias is the introduction of systematic error due to the exclusion of studies based on language, and thus, the exclusion of potentially important data (Higgins et al., 2012). In addition to the possibility of introducing bias, Walpole (2019) cites two other important reasons to include non-English language articles. The first is the importance of valuing research regardless of language, and the second is that exclusion of this material may

result in the loss of important cultural insights or context. These points are especially relevant for global health research where the exclusion of non-English language research may preclude a truly global perspective.

However, including non-English language articles raises a number of important challenges as translation involves costs and can be time consuming (Neimann Rasmussen and Montgomery, 2018). As there were no additional funds to cover translation costs for this systematic review, an alternative solution to the translation problem had to be found. There is growing interest in using technology to overcome translation difficulties and online translation tools such as Google Translate (2021) are becoming more accurate (Jackson et al., 2019; Stern and Kleijnen, 2020; Walpole, 2019). There are also an increasing number of systematic reviews using Google Translate for non-English language articles (for an example see Fidahic et al., 2020). A recent study found a concordance rate of 91% between data abstracted from the same study by a native speaker and by a non-native speaker using Google Translate to translate the study into English. This suggests that use of Google Translate is adequate for data extraction purposes (Jackson et al., 2019).

Although the inclusion of non-English language studies is a strength, the use of Google Translate, rather than translators, remains a limitation of this study and may have introduced error at the data extraction stage due to translation inaccuracies. However, this risk is likely to be small and is outweighed by the benefit of including these studies. Almost half (20/51) of the studies retrieved by the searches and fulfilling the inclusion criteria were in languages other than English. Of the 23 studies from the Americas, 19 were non-English language studies, therefore, excluding these studies would have significantly impacted the results of this review, removing almost all the available data from this region.

Another limitation of this study is that searches were limited to electronic databases and reference lists, and grey literature was not searched meaning that some data may have been missed. However, inclusion of grey literature requires significant extra resources of time and effort, and the internal validity and risk of bias is difficult to assess (Schmucker et al., 2017). In addition, studies by Schmucker and colleagues (2017) and Hartling and colleagues (2017) suggest that the exclusion of unpublished studies has minimal impact on the results of systematic reviews and on the pooled estimates generated by meta-analyses. Furthermore, our analysis of publication bias indicated that there was a low risk of publication bias for all subscales except for the DP and PA subscales in the subset of physician studies. On balance, it is unlikely that the exclusion of grey literature has significantly impacted the overall results of this review.

4.6 Conclusion

The findings from this review suggest that levels of burnout are significant across all cadres of primary care professionals. The high prevalence of burnout in primary care nurses is a concern especially regarding patient safety. Further research is necessary to investigate the factors that predict burnout in this group and to look at ways of reducing demands on primary care nurses, possibly by increasing FP numbers to provide professional support, and clinical expertise. However, burnout prevalence is also high among FPs and therefore, any restructuring of roles and responsibilities needs to be done with this in mind. It is essential to better identify protective factors, such as support, continuing education, and regular rest breaks, and incorporate them into any system changes.

It is clear from the distribution of the studies that there is a paucity of research across LMICs. Given the consequences of burnout in healthcare professionals and the importance of

primary care in achieving UHC, this lends an urgency to the need to better understand burnout in these settings, especially in Africa and South-East Asia where workforce shortages are greatest. Further research is essential to more accurately estimate the scale of burnout amongst primary care professionals in these regions. In addition, it is vital to better establish the factors associated with burnout in LMICs, particularly modifiable ones such as organisational factors, as this is crucial to the development of appropriate work policies and interventions. In terms of the measurement and diagnosis of burnout there is a global need to establish clear diagnostic criteria to better estimate the prevalence of this syndrome and its impact both on healthcare professionals and health systems.

This thesis aims to address some of the gaps identified by this review by collecting data on the prevalence of burnout, the factors associated with burnout, and the experience of burnout amongst FPs in six target LMICs of South Africa, Zambia, Uganda, Pakistan, Sri Lanka, and Malaysia. Only one of these countries, South Africa, has contributed data on the prevalence of burnout in FPs to this systematic review. The South African study was limited to the Cape Town Metropolitan Municipality and excluded FPs working in city health clinics because of differences in working conditions. No data was found on the prevalence of burnout in FPs in the other five target countries. Therefore, this thesis will extend the current evidence base for the prevalence of burnout in FPs to a wider spread of LMICs and add to the current understanding of both the factors associated with burnout, and the experiences of burnout in this group of physicians in these specific settings. This review has also identified some understudied factors associated with burnout. For example, only one study looked at whether time taken to travel to work was associated with burnout, and only two looked at the significance of exercise. This thesis will seek to address some of these gaps by including in the questionnaire questions that cover some of these understudied associated factors. It is vital to address these gaps in the current research if interventions and policies are to be

developed to mitigate the impact of burnout in LMICs, especially with the projected increases in workforce shortages going forward.

5.1 Research philosophy

The underlying paradigm for this thesis was one of pragmatism, arguing that neither positivist nor interpretivist paradigms were sufficient on their own to understand the impact of burnout on FPs working in LMICs. Thus, a more pluralist approach, combining both quantitative and qualitative methods, was both a practical and scientifically valid means to explore the phenomenon of burnout (Kivunja and Kuyini, 2017). However, this philosophical approach is not without controversy as some would argue that the different paradigms underpinning quantitative and qualitative approaches are incompatible and cannot be combined (Denzin, 2010). Fundamental differences in assumptions about the nature of reality, and the ways in which it can be known and understood, underlie this perceived incompatibility (Dures et al., 2011). While quantitative approaches assume the objectivity and universality of reality, qualitative approaches assume a socially constructed, experiential, and subjective reality (Dures et al., 2011). However, the pragmatist argues that both quantitative and qualitative approaches are useful, perhaps even necessary, to fully explore complex social phenomena (Bryman, 2006a), and is committed to functional knowledge where researchers are free to choose the methods that work best in the context of their research question, without being confined to a particular epistemology (Dures et al., 2011). Indeed, Oakley (1999, p.252) states that the purpose of research is “...to provide some sort of approximation to what is ‘really’ going on” and argues that sometimes in social science this requires the combination of both quantitative and qualitative methods.

This thesis sought to investigate the phenomenon of burnout across a wide diversity of work and social environments, cultures, spiritualities, and economies which introduced layers of

complexity that were not easily fully explored using a single approach. Furthermore, context is important in burnout as evidenced by the multiplicity of organisational factors associated with the development of burnout and the influence of aspects of wider culture (Lo et al., 2018a; Maslach et al., 2001). Whereas the positivist approach to complexity is reductive, and context introduces unwanted variability, an interpretive approach embraces context and complexity as providing meaning, as all human experience is embedded in context (Greene, 2012). Greene (2012) argues therefore, that combining these opposing approaches, both controlling for, and embracing, aspects of context, results in a deeper, richer understanding of complex phenomena.

5.2 Mixed methods study design

Pragmatism often results in a mixed-methods study design where the combination of both quantitative and qualitative approaches is considered to be necessary to provide the best answer to the research question (Bryman, 2006a; Johnson and Onwuegbuzie, 2004; Shannon-Baker, 2016). In this thesis, the rationale for choosing a mixed methods design was methodological triangulation where quantitative and qualitative data were combined for the purpose of corroboration and completeness, measuring overlapping and distinct facets of a phenomenon, in this case the phenomenon of burnout (Bryman, 2006b; Greene et al., 1989; Guest and Fleming, 2015; Padgett, 2012). A strength of quantitative methods is that they can identify associations within data that would otherwise be obscured, whereas qualitative methods may allow unexpected themes to emerge that would be lost in purely quantitative data (McEvoy and Richards, 2006). Therefore, combining these different approaches can lead to richer, more reliable findings as different methods are used both to confirm findings (Risjord et al., 2002; Shih, 1998) and provide a more complete picture of the phenomenon

being studied, revealing different facets and perspectives (McEvoy and Richards, 2006). This results in a detailed and more elaborate understanding of the phenomenon that could not be achieved using one approach alone (Bryman, 2006b; Greene et al., 1989).

The research question for this thesis asked the prevalence of burnout and what factors may be associated with its development, as well as what impact this has on the lives of clinicians living in a selection of LMICs. The first two aspects, prevalence, and associated factors could be answered quantitatively, however, to gain a deeper understanding of the impact that burnout has on the lives of clinicians, the interaction and meaning of the associated factors, and the context within which the phenomenon of burnout occurs, it was necessary to adopt a qualitative approach. The integration of quantitative and qualitative data, therefore, provided a more comprehensive understanding of the impact of burnout, not simply at a population level but also at an individual level. The study design was convergent with quantitative and qualitative data collection occurring during a similar timeframe, followed by analysis and comparison of results, for the purpose of corroboration and completeness, and to enhance the credibility and validity of the research findings (Moseholm and Feters, 2017; Noble and Heale, 2019) , This is a well-recognised design for mixed methods studies (Creswell, 2015; Padgett, 2012).

Integration of the two strands of a mixed methods study is important (Creswell, 2015). In this study integration occurred at the point of recruitment for the interviews as interviewees were recruited from the questionnaire participants, via the questionnaire itself.

Furthermore, the topics for the qualitative semi-structured interview study were loosely based on the quantitative survey questions, providing a second point of integration and integration also occurred at the results stage where the results of the quantitative associated factor analysis were integrated with the qualitative thematic results.

5.3 Research aims and objectives

The aim of this research was to investigate the prevalence of burnout, the associated risk and protective factors and the experience of burnout if FPs in LMICs. This aim was met by the following objectives. The first objective was to estimate the prevalence of burnout in FPs in LMICs. This was achieved using quantitative survey methods. A survey containing the burnout measurement tool was administered, and prevalence percentages for burnout calculated. The second objective was to identify factors associated with burnout including risk and protective factors. This was also achieved using quantitative survey methods. Survey data were analysed using tests of association to identify factors associated with burnout and regression analysis to identify risk and protective factors. The third objective was to explore factors related to work-related stress and burnout and this was achieved using qualitative interview methods to explore in more depth the factors associated with work-related stress and burnout, and to compare and relate them to the quantitative findings.

5.4 Study Setting

5.4.1 Collaborating countries

The study setting was LMICs, as defined by the World Bank (World Bank, 2020) and based on income data for 2019. This defined a low-income country as one with a gross national income (GNI) per capita of less than \$1,035 in 2019; and a middle-income country as one with a GNI per capita of between \$1,035 and \$12,535, in 2019. The middle-income category was further divided into lower-middle-income countries, with GNI per capita of between \$1,035 and \$4,045; and upper-middle-income countries, with a GNI per capita of between \$4,045 and \$12,535. The list of LMICs used for this study is presented in Appendix E.

A number of factors influenced the choice of which specific LMICs to include. The first factor was the WHO regions where healthcare shortages are greatest, which are the Africa region and the SE Asia region (WHO, 2016). The second factor was the regions and countries identified in my systematic review as having a dearth of studies specifically looking at burnout in FPs. The third factor was KU's existing network of links with primary care institutions, physicians, and groups in LMICs which could facilitate a collaboration. After consideration of all these factors, six countries were chosen for data collection: Sri Lanka representing SE Asia; Pakistan representing the Eastern Mediterranean region; Malaysia representing the Western Pacific region, and South Africa, Zambia, and Uganda representing the Africa region (WHO, 2021b). The chosen countries also represented a range of different economies from low-income to upper-middle-income, with Uganda falling into the low-income category, Zambia, Pakistan, and Sri Lanka representing the lower-middle-income category and Malaysia and South Africa representing the upper-middle-income category. The region of the Americas was not represented as my systematic review found that this region had more studies on burnout in FPs than any other apart from the European region. In addition, most Central and South American countries use either Spanish or Portuguese as the language of education, rather than English. This would have required extra resources for translation, for both the quantitative and qualitative components of this thesis, which were not available. Unfortunately, a decision was eventually made in September 2023 to exclude Uganda from this thesis as, due to significant administrative delays, ethical approval was still pending leaving insufficient time for recruitment, data collection, and analysis. Collaborators were also identified in each chosen country. Their role was primarily to assist with obtaining local ethical approval and necessary research permissions, to advise on the development of the questionnaire especially regarding cultural context, and to recruit for

the survey via their local professional networks. All were researcher FPs and, as members of the research community, fulfilled a co-investigator rather than a stakeholder role.

5.4.2 Health system setting by country

This section provides a brief overview of the health system and role of FPs in each of the chosen countries, beginning with Sri Lanka. Sri Lanka's public healthcare system provides free access to healthcare for all citizens. Their primary care services are well established and comprised of the two streams of preventive community healthcare and primary curative health care (Perera et al., 2019). The curative stream is delivered via a network of medical care units and divisional hospitals. Medical care units provide basic medical outpatient facilities as well as hosting programmes such as vaccination and maternal health care programmes, and most are staffed by medical officers. Divisional hospitals provide additional services such as some inpatient, nursing and laboratory facilities (Perera et al., 2019). FPs do not have a gatekeeper role in Sri Lanka's system and patients can access curative care at primary, secondary or tertiary level with no boundaries, or requirement for patient registration (Perera et al., 2019; Ramanayake, 2013). Sri Lanka also has a private healthcare sector and many FPs work across both public and private sectors. However, doctors may set themselves up in private general practice with no specialist family physician training, the only requirement is registration with the Sri Lanka Medical Council (Ramanayake, 2013). Family medicine has been a recognised specialty in Sri Lanka since 1979 (Ramanayake, 2013).

Malaysia established primary care services in 1957, introducing family medicine specialists in 1997 to strengthen their primary care services and fulfil a gatekeeper role (Lee et al., 2023). Their health system comprises both private and public sectors with the public sector primary care providing almost two-thirds of outpatient care and delivering universal provision for a

nominal user fee. (Lee et al., 2023; Lim et al., 2021; Ong et al., 2022). While most private primary care clinics are solo practices and there is no regulation governing performance, most public sector clinics are staffed by a multidisciplinary team including FPs, nurses, physiotherapists, occupational therapists and pharmacists and are regulated by the Ministry of Health (Lee et al., 2023; Ong et al., 2022). In rural areas these clinics may also provide oversight of mobile health teams (Lee et al., 2023).

South Africa has both private (including NGOs) and public healthcare provision (Abrahams et al., 2022), and family medicine has been recognised as a speciality since 2007 (Chu et al., 2020). The public system comprises primary care, secondary care, and tertiary care, with the primary care level extending to include district hospitals where many FPs are based, fulfilling a role that involves clinical supervision as well as clinical governance (Gaede, 2020; Moosa et al., 2018). FPs based at district hospitals may be involved in the delivery of a wide range of clinical care including surgical procedures (Chu et al., 2020). Their supervisory and governance role may also involve oversight of smaller community health centers, usually run by nurses or clinical officers (healthcare professionals with three years of medical training) (Gaede, 2020). While FPs have completed specialist training in family medicine, South Africa also has doctors classed as general medical practitioners or GPs who do not have specialist training in family medicine but who work as generalist doctors, many in the private sector (Moosa et al., 2018).

Zambia's health system structure is similar to South Africa's. There are both private and public sectors within healthcare provision and public healthcare offers basic services free of charge (Haldeman et al., 2022). It is a three-level system (primary, secondary, and tertiary services) with district hospitals included in the primary care level of provision. In addition to district hospitals, primary care facilities include rural health posts and larger health centers

(Songiso et al., 2020). These smaller health facilities are largely staffed by nurses and clinical officers. Zambia began training its own FPs in 2019 with the launch of a four-year FP training programme, therefore, many of the doctors working as general practitioners do not have specialist family medicine training (Haldeman et al., 2022). Traditionally, in many African countries, primary care services have been largely nurse-led (Arya et al., 2017; Moosa et al., 2018).

Finally, Pakistan's health system also has both a public, subsidised sector and a largely unregulated, fee-for-service private sector (Amin and Sabzwari, 2018a, 2018b). Primary healthcare services provide curative and preventive services via a system of dispensaries, Basic Health Units, providing preventive, curative and referral services, and larger Rural Health Centers, providing some diagnostic services and support to the Basic Health Units (Hassan et al., 2017; Jafree et al., 2021). Although, family medicine was recognised as a specialty in 1998, most primary healthcare is provided by medical graduates (general practitioners) who do not have any specialist training in family medicine (Tejani and Rashid, 2023). Many FPs work in both public and private sectors, and a majority work in urban settings (Amin and Sabzwari, 2018a; Tejani and Rashid, 2023). Family medicine is not considered an attractive specialty option for medical graduates and there is no clear career pathway (Amin and Sabzwari, 2018a; Sohail et al., 2020).

5.5 Study population

The study population was FPs. The definition of a FP varies widely globally and as such a broad but workable definition was established for the purposes of this study which is as follows: community-based physicians who, for at least part of their work, see any age of patient, for any medical condition as a first point of contact with healthcare services. A more

detailed discussion on the justification for using this definition has been presented previously in Chapter 1, section 1.2.1. The inclusion and exclusion criteria chosen for study participants are presented in Table 5.1.

Table 5.1 Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Must be either - qualified FPs or FP residents, if the relevant country recognises family medicine as a speciality Or - fully qualified generalist physicians working in community medicine as a first point of contact for patients, where any age patient is seen for any type of medical problem	Medical specialists – seeing only a particular age of patient and/or a particular type of medical condition Those who exclusively practice alternative or Ayurvedic medicine ¹
Must be currently working in South Africa, Zambia, Uganda, Pakistan, Sri Lanka, or Malaysia	Not currently working in one of the inclusion countries
If on leave, must have been working in a clinical setting within the past 12 months	On extended leave > 12 months
Must be fluent in English	Not fluent in English

The requirement for participants to be fluent in English was based on a combination of factors including resource availability, and the language of education in the relevant countries. These factors are discussed in more detail in section 5.7.4. Physicians who had been on leave for greater than a year were excluded as the questions on the questionnaire were largely work-related and would be difficult to answer for an individual who had been on extended leave. In addition, the longer the period of leave, the greater the chance of

¹Extra exclusion specific to the Sri Lankan context

introducing recall bias. However, it was acknowledged that one of the potential reasons for an extended period of leave is an accumulation of work stress and burnout and thus, those who had been on leave for up to one year were included.

5.6 Online mode of study

Both quantitative and qualitative strands of the study were conducted online. The online nature of the design was chosen to enable large amounts of data to be collected from a diverse range of geographical settings both efficiently and cost-effectively (Evans and Mathur, 2018). In addition, email invitations could be delivered within minutes rather than the sometimes-considerable time taken for international postal deliveries, and online surveys and interviews are more flexible and convenient for respondents (Archibald et al., 2019; Evans and Mathur, 2018; Van Selm and Jankowski, 2006). Furthermore, this study was designed during the COVID-19 pandemic when travel restrictions were in place and the study design had to account for the uncertainty of travel and the possibility of other disruptions including for example, the disruption of postal services. During the pandemic an increasing number of activities, including social and learning activities, moved online resulting in an increased familiarity with online modes of communication (de Villiers et al., 2021; Lobe et al., 2020; Parker, 2020), which may have benefitted this study. In addition, the use of online questionnaires is increasing and has more than doubled since 2007 (Daikeler et al., 2020). The questionnaire was accessed via both an online link and a QR code to allow for dissemination across email and social media. For the online interviews participants were given a choice of either being interviewed using the videoconferencing software, Microsoft (MS) Teams (version 24215.1007.3082.1590), or via email. Although email is a less common mode of data collection for interviews there are several advantages to its use, especially as

an alternative option to videoconferencing. These are discussed, along with the disadvantages, in the following sections.

5.6.1 Advantages of the online mode

5.6.1.1 Questionnaire

Conventional modes for survey data collection include sending out paper copies of the survey via a postal service, conducting the survey via the telephone, or conducting the survey as a face-to-face interview (Loomis and Paterson, 2018). More recently there has been an increase in the online mode of survey data collection where electronic surveys are sent out and completed online (Evans and Mathur, 2018). There are numerous advantages with the online mode of data collection for survey data. These include reduced costs, increased geographical reach, ease of use, flexibility, and speed of dissemination (Ball, 2019; Boardman et al., 2024; Loomis and Paterson, 2018). In addition, electronic survey platforms offer some advanced capabilities allowing for: automation of data entry which reduces errors; automated analysis; the ability to set questions as mandatory, minimising missing data; and the use of 'logic trees' which automatically direct the respondent to the relevant questions, and streamline the questionnaire process (Daikeler et al., 2020; Evans and Mathur, 2018; Loomis and Paterson, 2018). The lack of an interviewer may also reduce social desirability bias where the participant seeks to answer in a way they think the interviewer expects (Ball, 2019). Ease of access to special interest groups via social media may also be an advantage for the online mode where specific groups are being recruited for research, for example, this thesis which focused on a specific occupational group (Ball, 2019). In many countries FPs join FP WhatsApp groups or other professional social media groups for support and this was a useful avenue for disseminating the questionnaire link. However, the use of

social media special interest groups can also be a disadvantage as discussed in section 5.6.2.1 (Ball, 2019). An additional advantage of the online mode for surveys is increased anonymity for participants as electronic surveys can be set up to be completely anonymous (Ball, 2019; Nayak and Narayan, 2019).

5.6.1.2 *Semi-structured interviews*

In the same way as for online questionnaires, wider geographical reach, convenience, accessibility, time-effectiveness and cost-effectiveness, are advantages of using an online mode for interviewing (Archibald et al., 2019; Boardman et al., 2024; Deakin and Wakefield, 2014; Gray et al., 2020; Irani, 2019). Time-effectiveness refers to the flexibility the online mode affords to busy, working participants as they can choose when and where the interviews are conducted. In addition, there are no travel costs for researcher or participants, making the online mode more cost-effective. This greater flexibility may increase access to underrepresented groups resulting in a greater breadth of perspectives (Archibald et al., 2019). Furthermore, Archibald et al. (2019) found that the majority of participants in their study preferred the online videoconferencing option over in-person or telephone interviews and de Villiers et al. (2021) found that participants preferred the combined video and audio option (videoconferencing) over audio alone (telephone). A consequence of the social distancing experienced during the COVID-19 pandemic is that potential interviewees are now more comfortable with, and have greater experience of, using videoconferencing software (de Villiers et al., 2021). Finally, online videoconferencing software may also offer greater data security as recordings such as those on MS Teams, can be saved directly to the researcher's secure Microsoft account (Archibald et al., 2019).

Although email interviewing is less common than other, more conventional, interviewing methods there are several advantages to its use that are relevant to this thesis. Shared advantages with videoconferencing include cost-effectiveness and geographical reach (Bowden and Galindo-Gonzalez, 2015; Hawkins, 2018; Ratislavová and Ratislav, 2014). However, there is the additional advantage of convenience as the participant can choose when to answer and how long to take, and there are no scheduling conflicts (Bowden and Galindo-Gonzalez, 2015; Fritz and Vandermause, 2018; Oates et al., 2022). Moreover, responses may be more thoughtful as participants have more time to reflect on both the questions and their answers (Bowden and Galindo-Gonzalez, 2015; Hawkins, 2018; Ratislavová and Ratislav, 2014). Furthermore, those who are more comfortable responding in writing, or where there are barriers, such as hearing or language difficulties, may be more likely to participate (Bowden and Galindo-Gonzalez, 2015; Ratislavová and Ratislav, 2014). Anonymity may be perceived by participants to be greater with email interviewing as the interviewer does not see their face, and the power differential may be perceived as less (Hawkins, 2018). A study by Oates et al. (2022) found that email interviews had higher completion rates than videoconferencing interviews and lower no show rates. Participants were also more likely to choose email interviewing over video or audio interviews, possibly due to the decreased logistical burden and increased perceived anonymity of email. An additional advantage of email interviews is the reduced transcription costs as email responses can be simply copied and pasted into the transcript. This reduces the potential for misheard interpretations and problems with audio quality (Hawkins, 2018). Overall, studies show that the quality of data does not differ between the videoconferencing interview mode and the email interview mode (Bowden and Galindo-Gonzalez, 2015; Oates et al., 2022). Therefore, in view of the facts that my intended participants might find it difficult to schedule time for an interview as they are a busy, working population living in different time

zones; that participants whose first language is not English may be more comfortable responding in writing; and that internet quality and connectivity may also be a concern, a choice of either videoconferencing or email interviews was offered in an attempt to maximise participation.

5.6.2 Disadvantages of the online mode

5.6.2.1 Questionnaire

Despite the many advantages associated with the online mode for surveys, there are also disadvantages. These include concerns around the privacy of data where IP addresses are collected or where the survey uses tracking links, linking survey responses to email addresses; and the perception that the online mode is 'impersonal' (Evans and Mathur, 2018; Nayak and Narayan, 2019). These disadvantages were addressed by setting up the survey to be completely anonymous. IP addresses were not collected and there was no tracking of email addresses. For the few surveys where participants disclosed their email addresses to enable contact for an interview, these email addresses were extracted from the survey data, stored in a separate file, and deleted once they were no longer needed. It is difficult to mitigate the disadvantage of online surveys being impersonal, however, the survey was advertised by local collaborators using their own personal professional networks, as well as professional social media groups where they were known members. Email networks were also used for recruitment. Disadvantages associated with not using an interviewer to collect survey data include the inability to clarify ambiguous question wording, or unfamiliar terms and the inability to explore any responses to open questions on the questionnaire (Ball, 2019). This was mitigated by piloting the questionnaire with local collaborators so that any ambiguous wording could be identified and clarified. In addition, although it was not possible

to explore specific answers to open questions on the questionnaire, the interviews provided an opportunity to explore some of these answers in a more general way.

Additional disadvantages to the online survey mode include the potential for lower response rates and the possibility that email invitations may be treated as 'junk mail' (Daikeler et al., 2020; Evans and Mathur, 2018). However, a study by Loomis and Paterson (2018) found that although response rates varied between modes there was no consistent pattern and overall little difference in response rates between the online and the postal mode. It is possible that some of the email invitations sent out in this study were treated as 'junk mail' and this may have reduced the overall response rate, however, email was not the only means of recruitment. The questionnaire link was also disseminated using social media groups and advertised through conferences and personal networks which mitigated this disadvantage. There is also the possibility that the quality of data may differ between different modes however, studies have demonstrated equivalence in the quality of data collected across different modes (Loomis and Paterson, 2018; Weigold et al., 2013).

The potential for introducing bias is also a disadvantage, as those without access to the internet or those who do not use social media are excluded (Ball, 2019). This was relevant for this thesis as access to the internet can be variable and costly in LMICs and although use of mobile phones is increasingly widespread (Bahia and Suardi, 2019; Feroz et al., 2020), internet data is costly. Unfortunately, it was not possible to re-imburse participants for the cost of their data as there was no additional research funding available for this. Survey fraud, where participants complete the survey multiple times or deliberately falsify answers is also a disadvantage of the online mode (Ball, 2019). It is extremely difficult to identify and mitigate deliberately falsified answers, however, the survey platform used for the questionnaire did allow the questionnaire to be set to limit responses to a single response

from each individual IP address. This mitigated the possibility that participants would seek to complete the questionnaire multiple times.

5.6.2.2 *Semi-structured interviews*

There are also disadvantages to the online mode for interviewing and some evidence that in-person interviews generate more richly detailed, and higher quality data (Johnson et al., 2021). However, while Johnson and colleagues found that in-person interviews were more richly detailed, the substantive codes generated by in-person interviews were not significantly different from those generated from remotely conducted interviews. Other disadvantages include a reduction in non-verbal interview information which may increase difficulties understanding unfamiliar accents (Boardman et al., 2024), challenges building rapport, and the potential for technical difficulties (Archibald et al., 2019; Gray et al., 2020; Irani, 2019). Interestingly, Archibald and colleagues (2019) found that for some of their online interviews, technical difficulties and the resultant shared problem solving between interviewer and interviewee, actually fostered rapport. Rapport can also be built online in much the same way as in person, by focusing on good communication techniques such as active listening and mirroring (de Villiers et al., 2021). Technical difficulties are more difficult to mitigate. Internet connections are not always reliable, and audio and video quality may be poor. Thus, participants were given instructions, prior to interview, for re-accessing the interview if the internet connection was lost and in one case an interview had to be re-scheduled because of poor connectivity. In addition, it may be difficult for participants to find a private space for the interview if they are being interviewed from home or from a busy office. However, interviewees were encouraged to try to choose a time and place for the interview that would enable privacy. Finally, where participants are using their own online

data for the interviews, this can be costly and represents a barrier to participation. This could be mitigated by providing compensation to interview participants; however, this was not possible for this thesis as there was no extra funding for research costs.

Email interviewing shares many of the same disadvantages as interviewing via videoconferencing, however, there is less potential for the technical difficulties that might limit videoconferencing. Rapport may be more difficult to build but exchanging several emails prior to sending the interview questions can help to build rapport and Oates et al. (2022) found no evidence that rapport was affected by mode. Other disadvantages in email interviewing include the lack of social cues, delays in receiving data, and attrition, as email interviews require the exchange of several emails over a period of time (Bowden and Galindo-Gonzalez, 2015). These can be mitigated by sending reminders to participants and using emoticons to communicate emotion. Furthermore, for this thesis the choice of either the email or the videoconferencing mode for the interviews allowed participants to choose the mode that they were most comfortable with, which was intended to reduce attrition. Certainly, for the purposes of this study the advantages of the online mode for both survey and interview data collection, outweighed the disadvantages.

5.7 Quantitative study

5.7.1 Method of data collection

The quantitative strand used a survey method, collecting data using an online questionnaire which combined a burnout measurement tool with questions regarding workplace and demographic factors. This enabled estimation of the prevalence of burnout as well as identification of factors associated with burnout in the less investigated setting of LMICs.

5.7.2 Questionnaire development

A questionnaire was developed for use in this research, which combined the OLBI, a validated tool for the measurement of burnout, with supplementary questions relating to sociodemographic, and workplace characteristics. A detailed discussion of the justification for choosing to use the OLBI rather than the more dominant MBI as the burnout measurement tool has been presented previously in Chapter 3, section 3.4. In summary, although the dominant burnout measurement tool in the literature is the MBI there is ongoing debate around both the three-dimensional definition of burnout underpinning it, and the psychometric properties of the MBI (Demerouti et al., 2010; Demerouti and Bakker, 2008; Lee and Ashforth, 1996). The OLBI was created to address the shortcomings of the MBI, measuring the two dimensions exhaustion and disengagement rather than the MBI's three dimensions of EE, DP, and reduced PA (Lee and Ashforth, 1996; Schaufeli and Taris, 2005). It also combines positively and negatively framed questions, improving the psychometric properties of the tool (Halbesleben and Demerouti, 2005; Lee and Ashforth, 1990; Shoman et al., 2021). The OLBI is a 16-item questionnaire with good internal consistency. Reported Cronbach's alpha coefficients for the English translation of the OLBI range between 0.74 and 0.87 (Halbesleben and Demerouti, 2005). For this study, the Cronbach's alpha coefficient for the combined sample was 0.86 with separate coefficients for each country presented in Table 5.2.

Table 5.2 Cronbach alpha coefficients for current study

Country	Cronbach's alpha coefficient
Pakistan	0.80
South Africa	0.87
Malaysia	0.87
Sri Lanka	0.77
Zambia	0.87

The initial development of the supplementary questions was very much literature led; however, this approach was combined with a consultative process with the study collaborators. The questionnaire was shared with collaborators for their input and feedback prior to piloting it with them. Although the burnout measurement tool used is a validated tool, the full questionnaire was not formally validated. The first part of a two-part survey (Abyad et al., 2016; Soler et al., 2008), previously tested in burnout studies in Europe and the Middle East, was used to inform the initial development of the supplementary questions in sections 1 and 2 of the questionnaire which focused on the details of workplace, role, and workload. This was then altered and refined based on the extensive literature relating to physician burnout in HICs together with the findings from my systematic review of burnout in primary healthcare workers in LMICs (Wright et al., 2022). Section 2 of the questionnaire also included three open questions. The first asked “what other aspects of your work do you find especially stressful”; the second asked “what do you think the biggest problems in your country are with regard to workplace stress for community physicians”; and the third asked “what are some possible solutions to workplace stress in your country”. The answers to these questions were added to the qualitative data and analysed thematically.

Section 3 of the questionnaire comprised questions about factors that have been shown to be associated with burnout in previous studies such as fairness, support, turnover intention, coping and conflict. For example, the question ‘I often think about leaving my job’ was used to assess turnover intention; and ‘I am treated fairly at work’ was used to assess fairness in the workplace. These were presented as Likert questions with the following responses: strongly agree, agree, neither agree nor disagree; disagree; strongly disagree. Section 4 was the OLBI, which is a validated burnout measurement tool as discussed previously. Finally, section 5 consisted of sociodemographic questions regarding age, gender, educational level etc.

The questionnaire was piloted with collaborators in each of the six countries before use in the study to ensure that the wording of questions was culturally appropriate, to check timings, and to troubleshoot any technical issues. My collaborators were as follows: Dr Jalil Khan, Khyber Medical University (KMU), Pakistan; Drs Leigh Wagner and Liezel Rossouw, Stellenbosch University (SU), South Africa; Dr Christine Selvaraj, University of Malaya (UoM), Malaysia; Dr Aruni de Silva, University of Sri Jayewardenepura (UoSJ), Sri Lanka; Dr Mpundu Makasa, University of Zambia (UNZA), Zambia; and Dr Raymond Tweheyo, Makerere University (MakUni), Uganda. There were no technical issues during the pilot and only minor wording and cultural issues were identified and changed. Examples of changes that were made include the addition of extra detail to the question asking about night shifts to clarify that a night shift could be either on-site working or off-site working; the addition of postgraduate certificate and postgraduate diploma to the answer options for the question on education; and the addition of 'both' and/or 'other' to the answer options for questions regarding workplace and employment to allow for portfolio work. Furthermore, Dr de Silva identified that the question 'My manager is supportive of me at work' was not relevant to the Sri Lankan context where FPs do not work under managers. Thus, an extra sentence was added to this question advising participants to leave it blank if it was not applicable to their setting. In addition, Dr de Silva identified that there are FPs/general practitioners in Sri Lanka who exclusively practice Ayurvedic medicine. Therefore, an additional question was added specifically for the Sri Lankan context, asking about the practice of Ayurvedic medicine and excluding those physicians who exclusively practiced Ayurvedic medicine.

The questionnaire was administered online via the Keele Health Survey (KHS) platform. This platform uses LimeSurvey software (LimeSurvey GmbH, n.d.) to allow non-technical users to easily build their own questionnaires. User accounts are password protected and managed by Keele Information Technology (IT) services and data is then stored within Keele Data

Centers. Questions for determining eligibility and the burnout measurement tool were set as mandatory and logic trees were utilised to exclude respondents, to direct them to relevant questions, or to hide questions deemed as irrelevant based on previous answers. The link to the questionnaire was sent out in email invitations to participants by the local collaborator and also disseminated in a poster via professional social media groups such as WhatsApp. Included were details of both the local participating institution and KU, along with details of the local researchers involved, contact information if help was needed and the estimated time that the questionnaire would take. These details have been shown to increase response rates (Fan and Yan, 2010). The questionnaire was estimated to take between 10 and 15 minutes, close to the mean ideal length of a questionnaire which is estimated to be between 13.0 and 15.4 minutes (Revilla and Höhne, 2020). See Appendix I for a copy of the questionnaire and poster used in the study.

5.7.3 Sampling and sample size calculation

The target population was FPs working in LMICs, and the accessible population was comprised of those FPs, working in the specified six LMICs, who had access to the internet. To sample this population, convenience sampling with snowballing was chosen. Convenience sampling allowed the sampling of those FPs who were readily available through professional and institutional links and networks. They were then encouraged to pass the questionnaire link on to contacts of theirs who might also be interested in taking part (snowballing) intended to increase the reach of the study (Sim and Wright, 2000). Convenience sampling has many advantages especially where the target population is very large, and census sampling is not possible (Stratton, 2021). These advantages include affordability, accessibility of potential participants, ease of implementation, and time-effectiveness (Etikan, 2016; Hedt

and Pagano, 2011; Stratton, 2021; Taherdoost, 2016). However, convenience sampling is a type of non-probability sampling, meaning that the sample is a non-random sample of the target population and as such there are a number of disadvantages including a lack of generalisability and the introduction of various forms of bias including selection and motivation bias (Clark, 2017; Jager et al., 2017; Stratton, 2021; Taherdoost, 2016). Clark (2017) maintains that while convenience sampling does not meet the requirements for inferential statistics and therefore the results are not widely generalisable, it is still useful as a means to explore the relationships between variables especially in understudied areas. Using multiple sources to generate a convenience sample can help to mitigate the lack of generalisability (Winton and Sabol, 2022). This was done through recruiting via email lists, social media, professional networks, and conferences in an effort to reach as many FPs as possible in each of the six target countries. Bias is more difficult to mitigate. Self-selection bias where participants self-select if they wish to participate, and motivation bias, where participants choose to participate because they have a particular interest in the study topic or wish to express a particular opinion, are of particular concern (Stratton, 2021) and will impact the generalisability of the results. However, Kriska et al. (2013, p.2833) posits that “In practice, ... true random samples are rare and to some extent, all samples are convenience samples”. Thus, they suggest that knowledge may be accumulated gradually, with multiple studies, each only generalisable to a particular population subset, eventually combining to produce an accurate picture for the whole population.

An overall target sample size of 385 participants was calculated using an online calculator (link below) for a single proportion, using an estimated maximum prevalence of 50% with 5% precision (Dhand and Khatkar, 2014). A sample size adequate for hypothesis testing for each country was calculated using an estimated burnout prevalence of 35% (Wright et al., 2022), and the assumption that prevalence may vary by 15% between countries. Therefore, the

minimum required sample with 80% power and 5% significance level is 88 FPs per country. The calculated sample size was further adjusted by 10% for missing outcome data, resulting in an operational sample size of 100 FPs to be surveyed from each country to generate a reliable estimate for burnout.

[Sample Size Calculator for Estimating a Proportion \(statulator.com\)](https://statulator.com/)

5.7.4 Recruitment and data collection

The aforementioned research partners/collaborators were identified in each of the six countries chosen and these collaborators subsequently identified suitable physicians for recruitment. Physicians were then invited to participate in the study either via an email containing a link to a questionnaire which they could complete online, or via a poster posted on professional social media sites. The poster contained both links and scannable barcodes to the questionnaire and information leaflet (see Appendix I for study documents).

Participants were encouraged to share the survey link with other colleagues or relevant professional and social media groups and three reminders were sent out during the recruitment period. All survey data was stored initially on the KHS platform (see section 5.6.2), which is a secure, password protected platform allowing for complete anonymity of responses.

All data were collected in English as conducting the study in multiple languages would have incurred significant extra time and costs, either for translation services, or for the addition of multi-lingual researchers. This may have limited the opportunity for data collection from countries such as Malaysia where Bahasa Malaysia is the predominant language. However, there is evidence that the use of English as the medium of instruction (EMI) is increasing globally (Dearden, 2014). Furthermore, in many Eastern and Southern African countries

where English is viewed as “the linguistic means of achieving global citizenship” (Trudell, 2016, p.285), English is introduced as the medium of instruction at the primary school level (Trudell, 2016). In five of the six countries in this study (Pakistan, Malaysia, Sri Lanka, Zambia and Uganda) English is mandatory in primary school, and in the sixth (South Africa) while not mandatory it is taught throughout primary school and is the preferred language in higher education (Ngcobo and Barnes, 2021; Plonski et al., 2013; University of Winnipeg, 2023). It is also the language of instruction for higher education in countries such as Malaysia, Pakistan, and Sri Lanka, and this is especially so for science, technology, and medical programmes (Ali, 2013; Macaro et al., 2018; Mahboob, 2017; Navaz and Majeed, 2021). For this study, the target population was a professional one that has, by definition, at minimum a bachelor’s degree. Therefore, this language limitation should not substantially impact the results of the study.

Data (both quantitative and qualitative) was collected over the period from February 21st, 2022, until January 9th, 2024, country by country as ethical and regulatory approvals were granted. See Table 5.3 for details of data collection periods in each country.

Table 5.3 Data collection periods by country

Country	Data collection period
Pakistan	February 2022 – August 2022
South Africa	June 2022 – January 2023
Malaysia	October 2022 – April 2023
Sri Lanka	March 2023 – November 2023
Zambia	April 2023 – January 2024

5.7.5 Quantitative analysis

Questionnaire data were initially exported to Microsoft Excel version 2310 (Microsoft® Excel® for Microsoft 365 MSO) and then imported into IBM SPSS, version 27 (BM Corp. Released 2020. IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp) and Stata, version 18 (StataCorp, 2023) for further analysis.

Descriptive statistics were used to describe the participant demographic characteristics, workload, and workplace characteristics. All of these variables were categorical variables and were presented as percentages and frequencies. Burnout scores were calculated from the OLBI questionnaire (see section 5.7.5.1) and overall percentages for prevalence were calculated along with a mean total score and mean subscale scores. Prevalence percentages and mean scores were also calculated for each country. Factors associated with burnout were explored using the independent chi-squared test, Fisher's exact test, and Poisson regression analysis (see section 5.7.5.2).

5.7.5.1 Calculating burnout scores

Data from the OLBI were exported from the questionnaire into Microsoft Excel and scores were calculated using Excel. The OLBI consists of 16 questions, each with a choice of one of four answer options, scored from 1-4 (Strongly agree=1; Agree=2; Disagree=3; Strongly disagree=4). Eight of the questions are framed negatively which means that their score is reversed. The two subscales, disengagement and exhaustion also contain eight questions each. In line with previous studies, mean scores were calculated for each subscale with a score greater than or equal to ($\geq$) 2.25 on the exhaustion scale indicating a high level of exhaustion, and a score $\geq$ 2.1 on the disengagement scale indicating a high level of disengagement (Denning et al., 2021; Farrell et al., 2019; Nwosu et al., 2020; Peterson et al.,

2008a; Shrestha et al., 2021). Four categories resulted: one that was high in both exhaustion and disengagement; one high in exhaustion but low in disengagement; one low in exhaustion but high in disengagement; and one that was low in both exhaustion and disengagement. Scores were also summed for an overall burnout score with a score of ≥ 35 indicating an increased risk of burnout (Summers et al., 2020). For the purposes of this study a high risk of burnout was defined as a mean item score $\geq$ the aforementioned thresholds for both subscales and for analysis purposes burnout was categorised as either “yes” (high risk of burnout), or “no” (low to medium risk of burnout).

5.7.5.2 Tests of association and Poisson regression analysis

Chi-squared tests for independence were conducted to identify statistically significant relationships between independent variables, such as patient load, and weekly work hours, and the dependent variable, burnout. For binary variables where the assumptions for the chi-squared test of independence were not met Fisher’s exact test was used. Level of statistical significance was set at a p value of less than or equal to ($\leq$) .05. Categories for the Likert questions in Section 3 were collapsed to form 2 categories, “strongly agree” and “agree” were collapsed to form an “agree” category and “neither agree or disagree”, “disagree” and “strongly disagree” were collapsed to form a “do not agree” category. Other variables also had answer categories collapsed to create binary variables or variables with a smaller number of larger categories. For more detail, see the SPSS Codebook in Appendix J. Hierarchical Poisson regression was then performed to examine the association of demographic, workload, and organisational variables with burnout and the data was exported to Stata, version 18 (StataCorp, 2023) for this analysis. Poisson regression is traditionally used for count data but can also be used where the dependent variable is binary

(Barros and Hirakata, 2003). In addition, the alternative, logistic regression, risks overestimating the strength of association when the dependent variable is common and is more useful for rare or unusual outcomes (Tamhane et al., 2016). As burnout is common among healthcare professionals (Wright et al., 2022), Poisson regression was chosen to avoid the risk of overestimating the strength of association between burnout and the independent variables. Results, for the Poisson regression analysis, are presented as incidence rate ratios (IRRs) and 95% confidence intervals (CI). A hierarchical Poisson regression model was fitted, and country level heterogeneity accounted for within the model. As there were almost 30% missing data overall, a second model was fitted with imputed data and the original model used as a sensitivity analysis. Independent variables were divided into three categories: demographic variables, workload variables, and organisational variables. Model 1 contained the following demographic variables: sex, age group, years since medical school, and educational level. Model 2 added the following workload variables: average number of patients seen each day; average number of hours worked each week; and response to the statement 'we are often understaffed at work'. Finally, Model 3 added the following work characteristics to Model 2: adequate resources; opportunities for CPD; clearly defined role at work; fair treatment at work; safety at work; autonomy; support of colleagues helps coping; supportive manager; conflict at work; and conflict between work and home responsibilities. The variables chosen for the model were ones that were either significant in the burnout literature or significant according to the chi-squared analysis conducted previously on the study data. Organisational variables were focused on as being especially relevant for informing any subsequent intervention development.

5.8 Qualitative study

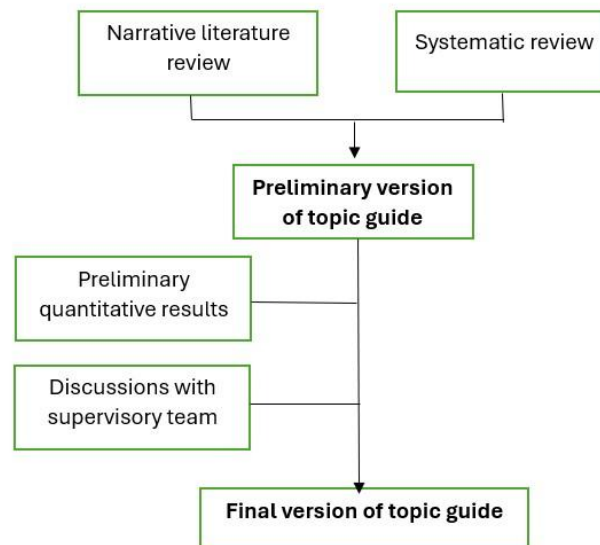
5.8.1 Method of data collection

The qualitative strand of the study employed semi-structured interviews to explore themes identified from the questionnaire results, as well as personal experiences of burnout, expanding our understanding of how burnout, and its associated factors, may impact on FPs in LMICs. Participants were given the choice of being interviewed via videoconferencing software (MS Teams) or via email. Each videoconferencing interview lasted between 30 to 60 minutes; email interviews required the exchange of 3-4 emails. Semi-structured interviews were chosen because they allow flexibility for unexpected themes to emerge, while also providing a degree of structure which improves the consistency of the data (Jamshed, 2014; Kallio et al., 2016).

5.8.2 Development of topic guide

A topic guide was developed for the semi-structured interviews (see Appendix I for the preliminary version). This was guided by findings from a narrative review of burnout, systematic review findings, discussions with the supervisory team, and preliminary quantitative results (see Figure 5.1).

Figure 5.1 Development of the interview topic guide



The topic guide consisted of ten topics and 13 questions designed to explore these topics in greater depth. Suggestions for probing questions were also included in the topic guide. Probing is important as it encourages participants to provide additional information or description, leading to greater clarity, and richer, more detailed data (Robinson, 2023). This resulted in a flexible but structured format within which to explore both the impact of burnout and the factors associated with burnout at an individual level. Topics included were work role and workload, motivation for career choice, values at work, support networks, stress at work, coping with stress, competency, availability of resources, professional development and training opportunities, and finally future intentions. This was updated throughout the study, and sub-topics added as they emerged from the questionnaire results and the interviews. There were only two additions to the interview topic guide from the questionnaire results. Participants were asked on the questionnaire what possible solutions they saw to workplace stress and once questionnaire results began to accumulate, with

some interesting responses to this question, it was added to the topic guide for the interviews. Additionally, travel to work was added as a probe when asking about stressors as the results from the Pakistan questionnaire found difficulties travelling to work to be significantly associated with burnout. No other additions were made from the questionnaire results.

Interviewing is an iterative process and therefore there were some minor changes made to the interview topic guide as interviews progressed. One sub-theme that began to emerge early in the interviews was that of the stigma attached to burnout and this was then added as an extra sub-topic for subsequent interviews. Additionally, it was mentioned early in the interviews that even when training opportunities were adequate, physicians often did not have the time to attend, and therefore time to attend training was specifically probed in subsequent interviews. Finally, it became clear during the first few interviews with South African FPs that regular and frequent power cuts (loadshedding) were impacting their work, and this was added as a specific probe for subsequent South African interviews.

5.8.3 Sampling, Recruitment, and data collection

The questionnaire was used to recruit participants for the qualitative strand. A question seeking consent to further contact for participation in an interview was included at the end of the questionnaire. As a phenomenological approach was chosen for the study, criterion sampling was used (Moser and Korstjens, 2018; Padgett, 2012). The phenomenon of interest was burnout therefore the burnout scores formed the main criterion for sampling, but a mix of baseline demographics were also sought within the sample (Moser and Korstjens, 2018). A purposive sample based on region, sex, experience as an FP, and questionnaire responses, was contacted by email to arrange the interview. The interview invitation email included the

link to the online consent form as well as two attachments: the interview information leaflet and a Word copy of the consent form in case there were any technical issues with the link. Participants were asked to complete the consent form and then reply with some times and dates when they would be available for interview. A maximum of three further reminders for the interview were sent out at fortnightly intervals. Some participants responded to the interview invitation by completing the consent form online but did not email with their availability. These respondents were contacted a maximum of twice to follow up on booking the interview. Those who requested email interviews and then failed to engage were also sent a maximum of two reminder emails at fortnightly intervals. Recruitment for the qualitative study continued throughout data collection and analysis, and until data saturation was reached, i.e., no new information relevant to the study objectives was emerging from the data and no new codes were being generated (Guest et al., 2020; Moser and Korstjens, 2018; Saunders et al., 2018). This definition of saturation aligns with Saunders and colleagues (2018) fourth model of saturation and can be demonstrated using the method outlined by Guest et al. (2020) whereby a ratio is calculated with the sum of new codes generated in the latest run of three interviews as numerator (run length) and the sum of new codes generated by the initial four interviews (base size) as denominator. Saturation is demonstrated when this ratio is $\leq 5\%$. This method assumes that the majority of new information generated by a dataset is generated early in the process, declining rapidly after only a small number of data collection events (Guest et al., 2020).

Initially a booking app (Calendly, 2013) was used to book the interviews, allowing participants to choose a time that suited them. However, due to poor initial response this was changed to email communication of available times. It was felt that a lack of convenient times on the booking app, might deter participants from booking an interview. In addition, an email exchange to arrange interviews provides a more personal touch than a booking

app, may encourage participation, and may be useful to build rapport prior to interview. For the videoconferencing interviews each participant was advised to choose a private place to be interviewed where they were unlikely to be interrupted. Information about what to do if the internet connection was cut off or if the quality of the call was poor, was included with the introductions at the start of each interview. Videoconferencing interviews were carried out by a single researcher (TW), via MS Teams. They were recorded on MS Teams and on a separate back-up voice recorder and lasted between 30 and 60 minutes. Email interviewing required several exchanges of emails over 2-3 weeks depending on the speed of response and busyness of the participant. If follow up interviews were required for videocalls, permission for further contact was sought at the initial interview. Data from interviews was transcribed semi-verbatim by the interviewer and then pseudonymised. Semi-verbatim transcription, in the context of this study, means that some extraneous sounds, fillers such as 'um', and paralinguistic elements, were excluded from the transcripts. Both the interview recordings, and the pseudonymised transcripts were stored on KU's password protected, secure drive. See section 5.7.4 for details of the dates of data collection periods.

5.8.4 Qualitative analysis

Thematic analysis was used for the qualitative data, which Braun and Clarke (2006) argue is a qualitative analytical method in its own right, alongside other qualitative analytical methods such as narrative analysis and grounded theory. It is described as a systematic method for determining patterns or themes of meaning within a dataset, allowing the researcher to make sense of shared participant experiences, and its flexibility makes it particularly suited to mixed methods designs where researchers may not be qualitative experts (Braun and Clarke, 2012). Braun and Clarke (2012) describe six phases of analysis. The first phase

involves the researcher becoming immersed in the data by listening to the video/audio recordings and by reading and re-reading transcripts and making notes. The second phase involves generating codes or labels for sections of data that are potentially relevant to the research question. In the third phase of analysis the codes are scrutinised for areas of similarity and clusters of similar codes are combined to form themes or broader topics within the data. In phase four the themes generated in phase three are reviewed and quality checked to determine whether they capture the data in a meaningful way. Phase five involves defining and naming the themes identified so that each theme has a focus, and the combination of themes gives a clear picture of the story within the data. Also, in phase five the researcher chooses extracts from the data to illustrate each theme. The final phase of this process involves writing up the story within the data as a written report.

Following these phases of analysis, interviews were transcribed semi-verbatim by the researcher (TW), and these transcripts, together with any researcher interview notes, formed the basis of the raw data (Moser and Korstjens, 2018; Raskind et al., 2019).

Transcripts were then anonymised and uploaded to NVivo 12 (Lumivero, 2017) for analysis. The next step in analysis involved the researcher familiarising herself with the raw data and beginning to look for patterns within it, leading to the identification of 'meaning units' or codes (Flynn and Korcuska, 2018). Coding is an iterative process involving the development of initial codes, then the generation of preliminary categories, then higher order categories, sub-themes and finally themes (Braun and Clarke's phases two through five) while constantly referring back to the data (Moser and Korstjens, 2018; Padgett, 2012; Sundler et al., 2019). An inductive approach was used initially for the generation of codes and these codes were then grouped with codes of a similar meaning to form code groupings.

Following this initial inductive approach, a more deductive approach, was applied to the code groupings to identify themes. This deductive approach was based on the conceptual

framework of burnout (the JD-R model) and the extensive burnout literature. Clear records were kept of the process of analysis to create a transparent audit trail (Flynn and Korcuska, 2018; Sundler et al., 2019) and peer debriefing and support was provided by the supervisory team (Padgett, 2012). Coding and emerging themes were discussed and reviewed by a member of the supervisory team (TS). Sampling, and data collection continued until data saturation was achieved, as per the definition of data saturation presented in Section 5.8.3. Reflexivity, recognising how the researcher's own background, and beliefs may influence the study, is an essential part of conducting qualitative research (Dodgson, 2019). Thus, throughout the interview and analysis process I endeavoured to be aware of how my background as an FP, and my own experience of work-related stress and burnout, might influence this part of my PhD. In addition, I was raised in Kenya and spent two years of my adult life living in Sudan, so I have some experience of the challenges of life in an LMIC and this too had the potential to influence both data collection and analysis. Throughout the data collection and analysis process I was very aware of the potential interaction of these personal factors with the data, and of my responsibility to present the views and experiences of the participants accurately and without bias. I focused on using an empathetic and courteous interview style to build rapport with participants, as well as using probes for clarification and reflective statements to check understanding. In addition, I endeavoured to control the potential for assumptions and bias by being reflective and self-critical. I made notes throughout the interviewing process and regularly reflected on what my own answers to the interview questions would be and how this might influence data collection and analysis. An example of this was becoming aware early on in the interview process of my assumption that physicians suffering from burnout would regret their choice of career, when in fact many of the participants had no regrets. Acknowledging my own assumptions and bias enabled a more open questioning style, and the development of

genuine curiosity to explore participants perceptions and experiences as distinct from my own.

The field notes recorded information about the interview setting and context, as well as details of participant behaviour and elements of the interview that would not necessarily be captured in the transcript, such as external noise, interruptions etc. They also included personal reflections. These were invaluable for adding context during the analysis process. For some interviews, details, such as bars on the windows behind a participant, added context to discussions on working in high crime areas and feeling safe at work. Several of the interviews that were conducted at work were interrupted, and one had to be re-scheduled because the participant was called to a clinical emergency during the interview, adding insight into the demands on participants. Notes on participant behaviour and emotions during the interviews also added contextual detail during the analysis process. For some interviews, the camera had to be turned off because of poor internet connection, reducing the amount of non-verbal and contextual information that was available. Personal reflections on each interview identified areas of improvement for interview technique, acknowledged that interviews that were conducted without cameras or via email felt more challenging because of the lack of non-verbal information, and exposed researcher assumptions and bias.

5.9 Data storage

Once questionnaire data collection was completed the data was exported from the KHS platform as an excel spreadsheet for analysis. The anonymised data was then stored in a password protected file on KU's Onedrive. Where participants consented to be contacted for interview, questionnaires were anonymised following removal of contact details. Contact

details of interviewees were stored separately in a password protected file on KU's secure drives and deleted following completion of their interview. The interview recordings, as well as the pseudonymised transcripts, were also stored securely in a password protected file on KU's drives. Once recorded audio or audio-visual data from the interviews were transcribed and pseudonymised it was deleted. All data was stored in accordance with KU's Standard Operating Procedures (SOPs). At the end of the study, country specific, fully anonymised, data will be shared with the local co-investigator(s) for local use. This will be done via SharePoint with named owners as per guidance from KU's IT department and relevant data sharing agreements. In addition, given that recruitment took place over a wide geographical area and there was transfer of data outside the European Union (EU), a Data Protection Impact Assessment (DPIA) was completed and submitted to the data protection officer.

5.10 Ethical considerations

Ethical approval was sought through the Faculty of Medicine and Health Sciences (FMHS) Ethics Committee at KU as well as through Institutional Review Boards (IRBs) in each partner country as per each country's research ethics requirements (see Appendix K for approval documents). The research partner in each country assisted with the following: obtaining ethical approval; recruiting physicians and disseminating the questionnaire; and adding context to data obtained from their country. Country specific, fully anonymised, data from the study will be fed back to these research partners at the end of the study.

A link to the information leaflet containing information regarding the study, its aims and objectives, possible benefits, and any risks, was included at the start of the online questionnaire, together with a consent declaration (see Appendix I for all study documents including information leaflets and consent forms). Participants were assured of the voluntary

nature of their participation, the anonymity and confidentiality of all results, and of their right to withdraw from the survey questionnaire prior to completion. They were given the opportunity to ask any questions by contacting the lead researcher. Once the questionnaire was submitted it was not possible to withdraw.

Interview recruitment was done through the questionnaire and required a first name only and email address. Email addresses were stored separately in a password protected file on KU's OneDrive and were deleted immediately following the interview. Any identifying information (for example names, places, dates) was removed from the interview transcripts before analysis and storage in a password protected file. For the interview study an information leaflet and a link to the online consent form was emailed to each participant who agreed to be contacted for interview, to be completed prior to interview. Verbal consent was obtained again at interview, and participants had the opportunity to ask any questions. They were also assured of the complete confidentiality of all results and of their right to withdraw any interview data, on request, for up to two weeks after completion of the interview without the need to provide a reason, by contacting the lead researcher. At the end of the questionnaire there was a recommendation for participants to seek help from local healthcare professionals if the study had raised any concerns or issues that they felt they needed to discuss. This was re-iterated in the interview information leaflet.

5.11 International collaboration and ethical approval

Collaborators/research partners with local affiliations were identified in each of our target countries. The collaborating institutions were as follows: Khyber Medical University (KMU), Pakistan; Stellenbosch University (SU), South Africa; University of Malaya (UoM), Malaysia;

was considerable, due diligence had been completed, the study was a low-risk study with no funds involved apart from ethics fees, and KU has a history of collaboration with SU. Once SLAs were in place applications were made for local ethical approval.

Ethical approval processes vary from country to country. For example, in Uganda both institutional and national level approval are required, with the national agency being the Uganda National Council for Science and Technology (UNCST). In Zambia, although ethical approval is only required at the institutional level, once ethical approval has been obtained the study proposal and institutional approval must be submitted to the National Health Research Authority (NHRA) for their additional approval before data collection can begin. In Pakistan, Sri Lanka, South Africa, and Malaysia only institutional level approval is required for a study such as this. Some countries also require a local principal investigator for all local research to ensure cultural appropriateness and local relevance. The format of the research protocol was adapted for applications to the IRB at MakUni, Uganda and for the IRB at UNZA, Zambia as per their IRB templates. The participant information leaflets, and consent forms were submitted unchanged from the approved KU faculty ethics committee format for all countries except for Malaysia, where they were adapted to fit the UoM template and the logo for the UoM was added. The application for KMU, Pakistan, was processed through their expedited system whereby 'desk approval' can be given to allow data collection to begin more quickly, with formal approval following.

The mode of application for all institutions was online but the UoSJ, Sri Lanka, also required the additional submission of paper copies of the study protocol and materials which incurred printing costs. Costs for ethics applications varied between countries. There was no fee for submitting an ethics application to KMU in Pakistan, however all the other institutions

required a fee of some kind ranging from approximately £10 to cover administrative costs, to almost £300 (see Table 5.4).

Table 5.4 Summary of fees for ethics applications

Country	IRB Fees	Additional fees
Pakistan	0	-
South Africa	R 1,410	-
Malaysia	MYR 100	-
Sri Lanka	SLR 5,030	SLR 1,030 (printing costs)
Zambia	K 2,500	-
Uganda	\$300	\$300 (UNCST fees)

These extra administrative processes (completing due diligence, negotiating SLAs, and obtaining ethical approval in each of the six countries) added more than 18 months to the study timeline and resulted in the eventual exclusion of Uganda from this PhD as significant delays meant that there was insufficient time remaining for recruitment, data collection, and analysis. Initial delays in Uganda involved agreement of the SLA and the payment of ethics fees which were not completed until November 2022. These delays were then compounded by a delay of over nine months between the submission of ethics application revisions and the final ethical approval decision from MakUni. Final ethical approval from MakUni was not confirmed until October 2023 with UNCST approval following in November 2023. The challenges of these additional administrative requirements will be explored and reflected on in more detail in Chapter 8.

5.12 Summary

In summary, this was a mixed methods study using both quantitative and qualitative methods to explore the phenomenon of burnout in FPs in LMICs. Initially six target countries

were chosen, Pakistan, South Africa, Malaysia, Sri Lanka, Zambia, and Uganda and collaborators at partner institutions in these countries were identified to help with both the ethics applications and recruitment for the questionnaire. This was later reduced to five countries for the aforementioned reasons. Data was collected via an online questionnaire, which included a burnout measurement tool, and online semi-structured interviews. Prevalence percentages were calculated for burnout, and tests of association carried out on demographic, workload, workplace, and coping variables. A hierarchical Poisson regression analysis was also performed. The interviews were analysed using a thematic approach. Following anonymisation and analysis of the data each country's data will be shared with the lead collaborator in that country for local use, and to inform local policy and practice. The following Chapters 6 and 7 will present the quantitative and qualitative findings of the study.

Chapter 6 Findings of the Quantitative study

There are two results chapters, Chapter 6, and Chapter 7. This chapter presents the quantitative survey results. These results meet the first two objectives of the thesis by estimating the prevalence of burnout in FPs in LMICS and identifying associated risk and/or protective factors. According to systematic review data (presented in Chapter 4, section 4.3.6.1), there is no published prevalence data for burnout in FPs in four out of the five countries included in this thesis (Pakistan, Malaysia, Sri Lanka, and Zambia). The fifth country, South Africa, has some limited, regional data collected in 2010 (Rossouw et al., 2013). Therefore, this new data will add to our current understanding of the prevalence of FP burnout and its associated factors in these five LMICs. Sample characteristics will be presented first, followed by the burnout prevalence results which will be presented as an overall prevalence and by country. The burnout measurement tool used is the OLBI which is a 16 item Likert scale, with two 8 item subscales, disengagement, and exhaustion. Each item is scored (1-4) according to the response on the Likert scale and these scores can either be summed for an overall score or, alternatively, a mean score can be calculated for each subscale (see Chapter 5, section 5.6.5.1). The prevalence data is followed by the associated factor analysis for the combined dataset as well as a breakdown by country and gender where appropriate. The chapter concludes with the results of the Poisson regression model. The results of the thematic analysis of the interview data are presented in Chapter 7, meeting the third objective of the thesis. The quantitative and qualitative results will then be integrated and compared as this was mixed methods for the purpose of methodological triangulation. Where qualitative results confirm the quantitative findings, and where

qualitative findings reveal facets of burnout that were not revealed within the quantitative findings this will be highlighted.

6.1 Overall sample size and sample characteristics

6.1.1 Sample size

The combined sample size for the study was 451 participants from five different countries: Pakistan, South Africa, Malaysia, Sri Lanka, and Zambia. A total of 794 individuals clicked on the questionnaire link. Of these 473 went on to complete the questionnaire, 22 of whom were subsequently excluded as ineligible. The main reason for ineligibility was answering either that they only saw a specific age group of patients or that they only treated specific medical conditions (i.e., considered therefore to be specialists). Of the 22 excluded, 9 only treated specific medical conditions; 9 only treated a specific age group of patients; 3 treated both only a specific age group and only specific medical conditions; and one from Sri Lanka exclusively practised Ayurvedic medicine. Due to the sampling method chosen (convenience sampling with snowballing) it is not possible to calculate the response rate as the total number of individuals who received an invitation to participate is unknown. Table 6.1 details the breakdown of sample size by country.

Table 6.1 Sample size breakdown by country

Country	Number that clicked questionnaire link	Number that completed the questionnaire		Number excluded as ineligible		Eligible sample size	
		n	% ²	n	%	n	%
Pakistan	250	115	46.0	7	2.8	108	43.2
South Africa	115	82	71.3	0	0	82	71.3
Malaysia	239	164	68.6	1	0.4	163	68.2
Sri Lanka	88	55	62.5	2	2.3	53	60.2
Zambia	102	57	55.9	12	11.8	45	44.1
Combined total	794	473	59.6	22	2.8	451	56.8

6.1.2 Demographic characteristics

In the combined sample respondents were predominantly female (49.9%; n=225) with 37.7% (n=170) male, and 12.4% (n=56) preferring not to answer. The most represented age group was the 30-39 age group (45.2%; n=204), followed by the 40-49 age group (31.5%; n=142), then the 50+ age group (13.5%; n=61), and finally the 20-29 age group (6.9%; n=31). A majority of 71.2% (n=321) were married or co-habiting and 68.7% (n=310) had children. Of the 437 respondents who completed the question on education level, over half (54.5%; n=238) had completed either a master's or a doctoral degree, 24.5% (n=107) had completed either postgraduate (PG) medical exams, a PG certificate, or a PG diploma, and the remaining 21.1% (n=92) had only completed their bachelor's degree. Healthwise, a fifth (20%; n=90) had a history of anxiety and just under a fifth (19.1%; n=86) had a history of depression. Only 9.5% (n=43) consumed alcohol regularly and 4.7% (n=21) were tobacco smokers.

There were some noteworthy differences between countries. Pakistan had the highest percentage of male respondents (61.1%; n=66), followed by Zambia (51.1%; n=23) and Sri

² percentages are calculated as a percentage of the number that clicked on the questionnaire link

Lanka (49.1%; n=26), while South Africa and Malaysia had only 36.6% (n=30) and 15.3% (n=25) male respondents, respectively. Regarding age group, Zambia had the highest percentage in the 20-29 age group (26.7%; n=12), more than twice the percentage for Pakistan and South Africa, while Malaysia and Sri Lanka had no respondents in this age group. The country with the highest percentage of married or co-habiting respondents was Sri Lanka (84.9%; n=45), while the lowest was Zambia (46.7%; n=21). Regarding dependents, Pakistan had the highest percentage living with other dependents (52.8%; n=57), while only 25.6% (n=21) of the South African sample live with other dependents. Educationally, the Malaysian sample had the highest percentage of participants with a master's or doctoral degree (85.9%; n=140). The full breakdown of demographic characteristics by country are presented in Table 6.2.

Table 6.2 Sample Demographic Characteristics

Characteristic		Pakistan (n=108)		South Africa (n=82)		Malaysia (n=163)		Sri Lanka (n=53)		Zambia (n=45)		Total (n=451)	
		Number (n)	Percentage ³ (%)	n	%	n	%	n	%	n	%	n	%
Sex	Male	66	61.1	30	36.6	25	15.3	26	49.1	23	51.1	170	37.7
	Female	33	30.6	47	57.3	110	67.5	17	32.1	18	40.0	225	49.9
	No answer	9	8.3	5	6.1	28	17.2	10	18.9	4	8.9	56	12.4
Age group	20-29 years	11	10.2	8	9.8	0	0	0	0	12	26.7	31	6.9
	30-39 years	51	47.2	37	45.1	83	50.9	16	30.2	17	37.8	204	45.2
	40-49 years	29	26.8	29	35.4	56	34.4	17	32.1	11	24.4	142	31.5
	50+ years	14	13.0	8	9.8	20	12.3	15	28.3	4	8.9	61	13.5
	No answer	3	2.8	0	0	4	2.5	5	9.4	1	2.2	13	2.9
Marital status	Married or co-habiting	83	76.8	56	68.3	113	69.3	45	84.9	21	46.7	321	71.2
	Not in a relationship	15	13.9	24	29.3	42	25.8	2	3.8	22	48.9	102	22.6
	No answer	10	9.3	2	2.4	8	4.9	6	11.3	2	4.4	28	6.2
Children	Yes	78	72.2	53	64.6	110	67.5	40	75.5	29	64.4	310	68.7
	No	23	21.3	29	35.4	49	30.1	8	15.1	14	31.1	123	27.3
	No answer	7	6.5	0	0	4	2.5	5	9.4	2	4.4	18	4.0
Other dependents	Yes	57	52.8	21	25.6	66	40.5	20	37.7	21	46.7	185	41.0
	No	47	43.5	61	74.4	92	56.4	28	52.8	23	51.1	251	55.7
	No answer	4	3.7	0	0	5	3.1	5	9.4	1	2.2	15	3.3
Highest educational level	Bachelor's degree	27	25.0	29	35.4	2	1.2	10	18.9	22	48.9	92	20.4
	PGCert ⁴ or PG ⁵ medical exams	18	16.7	5	6.1	14	8.6	3	5.7	3	6.7	41	9.1
	PGDip ⁶	36	33.3	11	13.4	3	1.8	15	28.3	1	2.2	66	14.6

³ Percentages are rounded to one decimal place

⁴ Postgraduate certificate

⁵ Postgraduate

⁶ Postgraduate diploma

	Master's or Doctoral degree	24	22.2	37	45.1	140	85.9	19	35.8	18	40.0	238	52.8
	No answer	3	2.8	0	0	4	2.5	6	11.3	1	2.2	14	3.1
History of anxiety	Yes	33	30.6	31	37.8	12	7.4	5	9.4	9	20.0	90	20.0
	No	68	63.0	50	61.0	146	89.6	42	79.2	35	77.8	341	75.6
	No answer	7	6.5	1	1.2	5	3.1	6	11.3	1	2.2	20	4.4
History of depression	Yes	24	22.2	37	45.1	11	6.8	5	9.4	9	20.0	86	19.1
	No	75	69.4	45	54.9	147	90.2	43	81.1	35	77.8	345	76.5
	No answer	9	8.3	0	0	5	3.1	5	9.4	1	2.2	20	4.4
Alcohol consumption	Yes	1	0.9	26	31.7	7	4.3	1	1.9	8	17.8	43	9.5
	No	103	95.4	56	68.3	152	93.3	46	86.8	36	80.0	393	87.1
	No answer	4	3.7	0	0	4	2.5	6	11.3	1	2.2	15	3.3
Tobacco smoking	Yes	8	7.4	10	12.2	1	0.6	2	3.8	0	0	21	4.7
	No	95	88.0	72	87.8	158	96.9	46	86.8	44	97.8	415	92.0
	No Answer	5	4.6	0	0	4	2.5	5	9.4	1	2.2	15	3.3

6.1.3 Workplace characteristics

In terms of job role, 63.4% (n=286) of the combined sample described themselves as general practitioners (GPs), family medicine specialists (FMS), FPs, or family medicine registrars. Of these 28 were from Pakistan (25.9% of the sample from Pakistan), 53 were from South Africa (64.6% of the South Africa sample), 150 were from Malaysia (92.0% of the Malaysia sample), 47 were from Sri Lanka (88.7% of the Sri Lanka sample), and 8 were from Zambia (17.8% of the Zambia sample).

The majority of respondents in the combined sample, 74.9% (n=338), were employed by the government, with a further 4.9% (n=22), combining government posts with private practice. 15.7% (n=71) were solely in private practice, 3.8% (n=17) were employed by outside agencies (e.g. non-government organisations (NGOs), private non-profit organisations or academic institutions), and 0.7% (n=3) did not respond to the question. The majority of those combining government employment with private practice were from Sri Lanka (n=19), followed by Pakistan (n=3). The Malaysian sample had the highest proportion working solely in government posts (95.1%; n=155), while the Sri Lankan sample had the lowest proportion working solely in government posts (49.1%; n=26). Pakistan had the highest proportion of respondents working solely in private practice (33.3%; n=36), while Pakistan (10.2%; n=11) and Zambia (11.1%; n=5) had the highest proportions of respondents working for outside agencies such as NGOs.

Over half of the combined sample (52.3%; n=236) worked in community-based clinics, 19.7% (n=89) worked in hospital-based clinics, and 23.9% (n=108) worked in both hospital-based and community-based clinics. Of note is the very high proportion of respondents from Malaysia working in community clinics (91.4%; n=149) as compared to the other samples. In

terms of catchment area, 47.7% (n=215) worked in urban areas, 22.8% (n=103) worked in rural areas with the remainder (29.3%; n=132) working either in semi-urban areas or in both rural and urban catchments. South Africa had the highest proportion of respondents working in solely urban catchments (67.1%; n=55), followed by Zambia with 55.6% (n=25). Pakistan had the highest proportion of respondents working in rural catchments (42.6%; n=46), while Sri Lanka had the lowest (1.9%; n=1). However, the Sri Lankan sample had the highest proportion of respondents working in a semi-urban or combined rural and urban catchment (47.2%; n=25). In terms of the length of time respondents had been in their current post, the majority (57.6%; n=260) had been in their current post for up to five years. This proportion was highest in the Zambian sample where 80% (n=36) had been in their current position for 0-5 years and lowest in the Pakistan sample (48.2%; n=52). Sri Lanka and Pakistan had the highest proportion of respondents who had been in their current post for more than 20 years: 15.1% (n=8) and 12.0% (n=13) respectively. A minority of 12.9% (n=58) worked in a second paid job and 28.8% (n=130) were engaged in unpaid voluntary work. The full breakdown of work characteristics according to country is detailed in Table 6.3.

Table 6.3 Employment and workplace characteristics

Characteristics		Pakistan (n=108)		South Africa (n=82)		Malaysia (n=163)		Sri Lanka (n=53)		Zambia (n=45)		Total (n=451)	
		Number (n)	Percentage ⁷ (%)	n	%	n	%	n	%	n	%	n	%
Job role	GP, FM specialist, FP, or family medicine registrar	28	25.9	53	64.6	150	92.0	47	88.7	8	17.8	286	63.4
	Other, including medical officer and clinical officer, and doctor	80	74.1	29	35.4	13	8.0	6	11.3	37	82.2	165	36.6
Type of employment	Government	58	53.7	62	75.6	155	95.1	26	49.1	37	82.2	338	74.9
	Private practice	36	33.3	19	23.2	6	3.7	8	15.1	2	4.4	71	15.7
	Both government and private	3	2.8	0	0	0	0	19	35.8	0	0	22	4.9
	NGO, non-profit or University post	11	10.2	1	1.2	0	0	0	0	5	11.1	17	3.8
	No answer	0	0	0	0	2	1.2	0	0	1	2.2	3	0.7
Type of clinic	Hospital clinic	36	33.3	14	17.1	7	4.3	16	30.2	16	35.6	89	19.7
	Community clinic	36	33.3	32	39.0	149	91.4	12	22.6	7	15.6	236	52.3
	Combined	32	29.6	24	29.3	5	3.1	25	47.2	22	48.9	108	23.9
	Other	4	3.7	12	14.6	2	1.2	0	0	0	0	18	4.0
Catchment area	Urban	39	36.1	55	67.1	69	42.3	27	50.9	25	55.6	215	47.7
	Rural	46	42.6	17	20.7	33	20.3	1	1.9	6	13.3	103	22.8
	Semi-urban or combined	22	20.4	10	12.2	61	37.4	25	47.2	14	31.1	132	29.3
	No answer	1	1.0	0	0	0	0	0	0	0	0	1	0.2
Years in current position	0-5	52	48.2	44	53.7	99	60.7	29	54.7	36	80.0	260	57.6
	6-10	25	23.1	18	22.0	32	19.6	8	15.1	6	13.3	89	19.7
	11-15	10	9.3	11	13.4	21	12.9	3	5.7	2	4.4	47	10.4
	16-20	6	5.6	4	4.9	6	3.7	5	9.4	1	2.2	22	4.9
	More than 20	13	12.0	4	4.9	5	3.1	8	15.1	0	0	30	6.7
	No answer	2	1.9	1	1.2	0	0	0	0	0	0	3	0.7

⁷ Percentages are rounded to one decimal place

Years since medical school	0-5	22	20.4	12	14.6	4	2.5	7	13.2	21	46.7	66	14.6
	6-10	26	24.1	14	17.1	11	6.8	10	18.9	11	24.4	72	16.0
	11-15	21	19.4	20	24.4	84	51.5	8	15.1	5	11.1	138	30.6
	16-20	13	12.0	12	14.6	34	20.9	9	17.0	2	4.4	70	15.5
	21-25	14	13.0	14	17.1	18	11.0	10	18.9	3	6.7	59	13.1
	More than 25	11	10.2	8	9.8	10	6.1	9	17.0	2	4.4	40	8.9
	No answer	1	1.0	2	2.4	2	1.2	0	0	1	2.2	6	1.3
Second paid job	Yes	14	13.0	7	8.5	10	6.1	20	37.7	7	15.6	58	12.9
	No	92	85.2	73	89.0	151	92.6	31	58.5	33	73.3	380	84.3
	No answer	2	1.8	2	2.4	2	1.2	2	3.8	5	11.1	13	2.9
Unpaid voluntary work	Yes	37	34.3	16	19.5	47	28.8	20	37.7	10	22.2	130	28.8
	No	66	61.1	63	76.8	113	69.3	31	58.5	31	68.9	304	67.4
	No answer	5	4.6	3	3.7	3	1.8	2	3.8	4	8.9	17	3.8

6.1.4 Workload characteristics

The section on workload was comprised of four questions: average number of patients per day, average number of hours worked per week, average number of overnight shifts worked in a month and average number of weekend shifts worked over a three-month period.

Average daily patient numbers were grouped into categories: 26.8% (n=121) of respondents saw on average less than 15 patients per day; 37.9% (n=171) saw 15-25; 15.1% (n=68) saw 26-35; and 12.9% (n=58) saw more than 45 on average each day. For average weekly hours, 41.2% (n=186) worked on average 41-50 hours per week, this was followed by 27.7% (n=125) who worked 31-40 hours per week, 20.8% (n=94) who worked more than 50 hours per week and finally, 9.6% (n=43) who worked 30 hours per week or less, and 0.75% (n=3) who failed to respond. The majority of respondents (67.0%; n=302) did not work night shifts during the week, and while 34.4% (n=155) did not work weekend shifts, 28.2% (n=127) worked an average of between one and three weekend shifts in a three-month period, and 15.7% (n=71) worked on average more than six weekend shifts in a three-month period. Also relevant for workload are the additional duties required of many physicians. On the questionnaire these were divided into five categories: management duties; administrative duties; teaching duties; research duties/involvement; and leadership duties. Just over a quarter (26.4%, n=119) of respondents had additional duties in all five categories, and a further 19.1% (n=86) had additional duties in four of the categories.

Of note, are the following differences between countries. In the Malaysian sample, 46.0% (n=75) of respondents saw an average of less than 15 patients per day, as compared to 8.9% (n=4) from Zambia. In contrast, 28.7% (n=31) of respondents from Pakistan and 24.4% (n=11) from Zambia saw on average more than 45 patients per day. The sample with the highest

proportion of respondents working an average of more than 50 hours per week was South Africa (39%; n=32), followed by Sri Lanka (26.4%; n=14), and Zambia (24.4%; n=11). The Zambian sample had the highest proportions working out of hours shifts (weekday night shifts or weekend shifts) with a third (33.3%; n=15) working an average of 5-8 weekday night shifts in a month, 17.8% (n=8) working an average of more than 12 weekday night shifts in a month, and 35.6% (n=16) working more than 6 weekend shifts in a 3-month period. This was followed by South Africa with 20.7% (n=17) and 11.0% (n=9) working an average of 5-8, and more than 12 weekday night shifts in a month respectively; and 19.5% (n=16) working more than 6 weekend shifts in a 3-month period. In contrast, 88.3% (144) from Malaysia, and 74.1% (n=80) from Pakistan did not work any weekday night shifts, and 43.6% (n=71) from Malaysia and 45.4% (n=49) from Pakistan did not work any weekend shifts. The full breakdown for workload is presented in Table 6.4.

Table 6.4 Clinical workload characteristics

Workload characteristics		Pakistan (n=108)		South Africa (n=82)		Malaysia (n=163)		Sri Lanka (n=53)		Zambia (n=45)		Total (n=451)	
		Number (n)	Percentage ⁸ (%)	n	%	n	%	n	%	n	%	n	%
Average daily patient load	Less than 15	18	16.7	17	20.7	75	46.0	7	13.2	4	8.9	121	26.8
	15-25	24	22.2	35	42.7	76	46.6	20	37.7	16	35.6	171	37.9
	26-35	20	18.5	23	28.0	5	3.1	12	22.6	8	17.8	68	15.1
	36-45	14	13.0	3	3.7	3	1.8	5	9.4	6	13.3	31	6.9
	More than 45	31	28.7	4	4.9	4	2.5	8	15.1	11	24.4	58	12.9
	No answer	1	1.0	0	0	0	0	1	1.9	0	0	2	0.4
Average weekly hours	Less than 20	6	5.6	2	2.4	1	0.6	3	5.7	1	2.2	13	2.9
	20-30	10	9.3	4	4.9	2	1.2	10	18.9	4	8.9	30	6.7
	31-40	46	42.6	18	22.0	36	22.1	15	28.3	10	22.2	125	27.7
	41-50	25	23.2	25	30.5	107	65.6	10	18.9	19	42.2	186	41.2
	More than 50	20	18.5	32	39.0	17	10.4	14	26.4	11	24.4	94	20.8
	No answer	1	1.0	1	1.2	0	0	1	1.9	0	0	3	0.7
Average monthly weekday night shifts	None	80	74.1	30	36.6	144	88.3	36	67.9	12	26.7	302	67.0
	1-4	17	15.7	22	26.8	11	6.8	7	13.2	10	22.2	67	14.9
	5-8	5	4.6	17	20.7	6	3.7	6	11.3	15	33.3	49	10.9
	9-12	1	1.0	4	4.9	1	0.6	2	3.8	0	0	8	1.8
	More than 12	4	3.7	9	11.0	1	0.6	1	1.9	8	17.8	23	5.1
	No answer	1	1.0	0	0	0	0	1	1.9	0	0	2	0.4
Average 3-monthly weekend shifts	None	49	45.4	16	19.5	71	43.6	11	20.8	8	17.8	155	34.4
	1-3	18	16.7	15	18.3	64	39.3	21	39.6	9	20.0	127	28.2
	4-6	23	21.3	35	42.7	16	9.8	10	18.9	12	26.7	96	21.3
	More than 6	17	15.7	16	19.5	12	7.4	10	18.9	16	35.6	71	15.7
	No answer	1	1.0	0	0	0	0	1	1.9	0	0	2	0.4

⁸ Percentages are rounded to one decimal place

Additional duties⁹	Yes	80	74.1	70	85.4	160	98.2	48	90.6	43	95.6	401	88.9
	No	28	25.9	12	14.6	3	1.8	5	9.4	2	4.4	50	11.1
	<i>One add duty</i>	36	33.3	11	13.4	4	2.5	13	24.5	6	13.3	70	15.5
	<i>Two add duties</i>	16	14.8	11	13.4	6	3.7	7	13.2	11	24.4	51	11.3
	<i>Three add duties</i>	17	15.7	10	12.2	24	14.7	10	18.9	14	31.1	75	16.6
	<i>Four add duties</i>	8	7.4	18	22.0	42	25.8	10	18.9	8	17.8	86	19.1
	<i>Five add duties</i>	3	2.8	20	24.4	84	51.5	8	15.1	4	8.9	119	26.4

⁹ Additional duties were chosen from a list of management, teaching, administration, leadership, and research with the extra option of choosing 'other' and free texting a description of other additional duties.

6.2 Measurement tool equivalence across cultural groups

As discussed in Chapter 3 (section 3.4.7), measurement tools may not be equivalent cross-culturally in terms of the constructs they measure, especially when a tool is developed in one culture and then simply translated for use in another (Byrne and Campbell, 1999). Byrne and Campbell (1999) suggest that highly variable skewness and kurtosis in measurement tool item scores across cultural groups suggest a lack of equivalence. Thus, skewness and kurtosis for each item score was calculated and compared across countries. Variability between countries was low, suggesting that the measurement tool is equivalent across the cultural groups in this study (see Table 6.5).

Table 6.5 Skewness and kurtosis for item scores by country

Scale items	Pakistan (n=108)		South Africa (n=82)		Malaysia (n=163)		Sri Lanka (n=53)		Zambia (n=45)	
	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis
Q1 I always find new and interesting aspects in work	.245	-.166	.586	.917	.308	.565	.382	.466	.102	.001
Q2 There are days when I feel tired before arriving at work	-.147	-.305	-.371	-.813	-.246	-.089	-.048	-.297	-1.523	3.269
Q3 Increasingly I think about work negatively	.335	-.165	-.130	-.902	.197	-.632	-.582	-.609	-.313	-.588
Q4 Need more time after work to relax and feel better	-.346	.456	-.222	-.883	-.169	-.442	.118	-.655	-.987	1.299
Q5 I tolerate the pressure of work very well	.349	.339	.091	-.147	.568	.560	.286	.447	.350	.047
Q6 Lately I think less at work and do my job mechanically	-.045	-.213	.342	-.233	.028	-.269	.268	-.455	-.407	-.254
Q7 I find work to be a positive challenge	.097	-.131	.262	.012	.333	.592	.763	1.751	.274	-.238
Q8 I often feel emotionally drained	-.259	-.096	-.197	-.848	.414	-.634	-.280	-.261	-.511	-.577
Q9 One can become disconnected form this type of work	-.208	.164	-.500	.157	.161	-.609	-.445	.232	-.888	1.226
Q10 After working I have enough energy for leisure activities	.125	-.763	.036	-1.035	.125	-.404	.159	-.183	-.147	-.632
Q11 Sometimes I feel sickened by work tasks	-.267	.158	.259	-.204	-.554	.654	-.686	.413	.076	-1.113
Q12 After work I usually feel worn out and weary	.175	-.519	-.222	-.883	-.103	-.221	-.190	-.006	-.290	-.848
Q13 This is the only type of work I can imagine myself doing	.335	.042	.266	-.764	.003	-.567	-.280	-.261	-.183	-.461
Q14 Usually I can manage amount of work well	.295	1.036	.328	.735	.637	2.399	.730	3.016	.390	.325
Q15 I feel more and more engaged in my work	.480	1.283	-.187	.069	.291	.226	.385	.343	-.089	-.655
Q16 When I work, I usually feel energised	.446	.815	-.184	-.132	.509	.025	.157	-.046	-.206	.129

6.3 Burnout prevalence

6.3.1 Overall burnout prevalence and prevalence by country

The overall prevalence of burnout, defined as mean item scores of ≥ 2.25 on the exhaustion subscale and ≥ 2.1 on the disengagement subscale, was 77.4% (95%CI 73.4-81.1). The prevalence of a high score on either the disengagement (high score defined as ≥ 2.1 ; range 1-4) or the exhaustion subscale (high score defined as ≥ 2.25 ; range 1-4) but not both was 15.7% (95%CI 12.6-19.3) and 6.9% (95%CI 4.8-9.5) had a low score (defined as <2.1 on the disengagement subscale and <2.25 on the exhaustion subscale) on both subscales. A second alternative scoring system for the OLB is also occasionally used in the literature. In this system item scores are summed across subscales for a single overall score, and a score of ≥ 35 (range 16 - 64) identifies those at high risk of burnout. When total scores were calculated, 85.8% (95%CI 82.4-88.8) had scores ≥ 35 , identifying them as high risk of burnout. The mean total score for the combined sample was 41.08 (SD 6.33; range 23-62), while mean item scores on the disengagement and exhaustion scales were 2.473 (SD 0.40; range 1.250 – 3.750) and 2.662 (SD 0.45; range 1.125-4.000) respectively for the combined sample.

The country with the highest burnout prevalence was Zambia with a prevalence of 84.4% (95%CI 71.9 – 92.8) and a mean item score of 2.603 (SD 0.50; range 1.250-3.625) for the disengagement scale (D) and 2.961 (SD 0.44; range 2.125-3.875) for the exhaustion scale (E). This was followed by South Africa with a prevalence of 81.7% (95%CI 72.3 – 88.9) and mean item scores: D=2.556 (SD 0.47; range 1.375-3.750) and E=2.875 (SD 0.44; range 2.000-4.000); Pakistan with a prevalence of 75.9% (95%CI 67.3 – 83.2) and mean item scores: D=2.439 (SD 0.35; range 1.500-3.250) and E=2.569 (SD 0.40; range 1.750-3.750); Sri Lanka with a prevalence of 75.5% (95%CI 62.8 – 85.5) and mean item scores: D=2.351 (SD 0.30; range

1.625-3.000) and E=2.417 (SD 0.39; range 1.125-3.125); and finally, Malaysia with a prevalence of 74.8% (95%CI 67.8 – 81.0) and mean item scores: D=2.457 (SD 0.39; range 1.250-3.375) and E=2.614 (SD 0.44; range 1.125-3.125). Mean item scores and full breakdown of burnout prevalence are presented in Tables 6.6 and 6.7, respectively.

Table 6.6 Mean total score and mean item subscale scores by country

Country	Sample size	Mean total score (SD; range)	Mean item score disengagement subscale (SD; range)	Mean item score exhaustion subscale (SD; range)
Zambia	45	44.51 (7.08; 27-60)	2.603 (0.50; 1.250-3.625)	2.961 (0.44; 2.125-3.875)
South Africa	82	43.45 (6.73; 32-62)	2.556 (0.47; 1.375-3.750)	2.875 (0.44; 2.000-4.000)
Malaysia	163	40.57 (6.15; 23-57)	2.457 (0.39; 1.250-3.375)	2.614 (0.44; 1.125-3.125)
Pakistan	108	40.06 (5.40; 28-54)	2.439 (0.35; 1.500-3.250)	2.569 (0.40; 1.750-3.750)
Sri Lanka	53	38.02 (4.99; 24-48)	2.351 (0.30; 1.625-3.000)	2.417 (0.39; 1.125-3.125)
Combined sample	451	41.08 (6.33; 23-62)	2.473 (0.40; 1.250 – 3.750)	2.662 (0.45; 1.125-4.000)

Table 6.7 Prevalence of burnout by country

Country	Sample size	Burnout prevalence defined as a total summed score ≥ 35 (range 4-64)		Burnout prevalence defined as a high mean item score on both the exhaustion ¹⁰ and the disengagement ¹¹ subscale		High mean item score on one subscale but not both		Low mean item score on both subscales (D<2.1 and E<2.25)	
		n	% ¹² (95%CI)	n	% (95%CI)	n	% (95%CI)	n	% (95%CI)
Zambia	45	42	93.3 (83.3-98.1)	38	84.4 (71.9-92.8)	5	11.1 (4.4-22.7)	2	4.4 (0.9-13.5)
South Africa	82	76	92.7 (85.5-96.9)	67	81.7 (72.3-88.9)	15	18.3 (11.1-27.7)	0	0 (0.0-3.0)
Pakistan	108	89	82.4 (74.4-88.7)	82	75.9 (67.3-83.2)	14	13.0 (7.6-20.2)	12	11.1 (6.2-18.1)
Sri Lanka	53	43	81.1 (69.1-89.9)	40	75.5 (62.8-85.5)	7	13.2 (6.1-24.2)	6	11.3 (4.9-21.9)
Malaysia	163	137	84.0 (77.9-89.0)	122	74.8 (67.8-81.0)	30	18.4 (13.0-24.9)	11	6.7 (3.6-11.4)
Combined Total	451	387	85.8 (82.4-88.8)	349	77.4 (73.4-81.1)	71	15.7 (12.6-19.3)	31	6.9 (4.8-9.5)

¹⁰ High score on the exhaustion subscale = mean item score ≥ 2.25 (range 1-4)

¹¹ High score on the disengagement subscale = mean item score ≥ 2.1 (range 1-4)

¹² Percentages are rounded to one decimal place

6.3.2 Burnout prevalence by gender and age group

Burnout prevalence (combined sample) also varied by gender and age group. The prevalence of burnout (as defined by high scores on both subscales) was highest among women, at 79.6% (95%CI 73.9-84.4), with 74.7% (95%CI 67.8-80.8) of men also falling into this category. When categorised by age group, the age group with the highest prevalence of burnout was the 20-29 age group (83.9%; 95%CI 68.2-93.6), followed by the 40-49 age group (81.7%; 95%CI 74.7-87.4), and then the 30-39 age group (78.4%; 95%CI 72.4-83.7). The 50+ age group had the lowest prevalence of burnout (59.0%; 95%CI 46.5-70.7). Of note, the prevalence of burnout in the group that did not disclose their age was the highest of all the groups at 84.6% (95%CI 59.1-96.7). See Table 6.8 for the full results.

Table 6.8 Burnout prevalence by gender and age group

Gender	N	High scores on both subscales ¹³		High score on one subscale		Low scores on both subscales ¹⁴	
		n	% (95%CI)	n	% (95%CI)	n	% (95%CI)
Male	170	127	74.7 (67.8-80.8)	31	18.2 (13.0-24.5)	12	7.1 (3.9-11.6)
Female	225	179	79.6 (73.9-84.4)	31	13.8 (9.7-18.7)	15	6.7 (3.9-10.5)
No answer	56	43	76.8 (64.6-86.3)	9	16.1 (8.3-27.3)	4	7.1 (2.5-16.1)
Age group							
20-29	31	26	83.9 (68.2-93.6)	4	12.9 (4.5-27.8)	1	3.2 (0.4-14.1)
30-39	204	160	78.4 (72.4-83.7)	34	16.7 (12.0-22.2)	10	4.9 (2.5-8.5)
40-49	142	116	81.7 (74.7-87.4)	18	12.7 (8.0-18.9)	8	5.6 (2.7-10.3)
50+	61	36	59.0 (46.5-70.7)	15	24.6 (15.1-36.4)	10	16.4 (8.8-27.1)
No answer	13	11	84.6 (59.1-96.7)	0	0 (0-17.3)	2	15.4 (3.3-40.9)

¹³ Mean item scores ≥ 2.1 disengagement subscale, ≥ 2.25 exhaustion subscale.

¹⁴ Mean item scores < 2.1 disengagement subscale, < 2.25 exhaustion subscale.

6.3.3 Stress at work and burnout prevalence

The question asking if participants ever felt stressed at work was answered by 432 participants of which 162 (37.5%) were male, 219 (50.7%) were female, and 51 (11.8%) did not disclose their gender. Out of the total of 432 respondents, 82.7% (n=373) answered, 'yes' and 13.1% (n=59) answered, 'no'. Of the 373 respondents who answered that they did feel stressed at work, 313 (83.9%) had high score on both subscales, and a further 48 (12.9%) had high scores on one of the subscales. Only 12 (3.2%) participants in this group had low scores on both subscales. However, of the 59 respondents who answered that they did not ever feel stressed at work, 44 (74.6%) had high scores on either one or both of the burnout subscales. Nineteen (43.2%) of these were men, 20 (45.5%) were women and five (11.4%) did not disclose their gender. See Tables 6.9 and 6.10 for the breakdown by gender.

Table 6.9 Gender breakdown of those who do not feel stressed at work

Gender	Sample size	Those with high scores on both subscales		Those with a high score on one subscale		Those with low scores on both subscales	
		n	%	n	%	n	%
Male	25	9	36.0	10	40.0	6	24.0
Female	27	10	37.0	10	37.0	7	25.9
Not disclosed	7	4	57.1	1	14.3	2	28.6
Total	59	23	39.0	21	35.6	15	25.4

Table 6.10 Gender breakdown of those who do feel stressed at work

Gender	Sample size	Those with high scores on both subscales		Those with a high score on one subscale		Those with low scores on both subscales	
		n	%	n	%	n	%
Male	137	113	82.5	20	14.6	4	2.9
Female	192	164	85.4	21	10.9	7	3.6
Not disclosed	44	36	81.8	7	15.9	1	2.3
Total	373	313	83.9	48	12.9	12	3.2

6.4 Frequencies – stressors and change

One question on the questionnaire asked participants what single aspect of their work they found most stressful, allowing them to choose from eleven answer options including the option to choose 'other', followed by a free text box allowing the respondent to elaborate. This question was followed by a second question asking participants what single change at work would make the biggest difference to their stress levels. This question had ten possible answer options again including the option 'other' with a free text box for elaboration. The following two sub-sections will present the results for these two questions.

6.4.1 'What single aspect of your work do you find most stressful'

There were 371 responses to this question. Of the ten answer choices, workload was the stressor most commonly chosen (23.2%, n=86), followed by non-clinical duties (20.8%, n=77), understaffing (11.3%, n=42), and inadequate salary (10%, n=37). A lack of adequate resources (9.2%, n=34) and work/family conflict (8.6%, n=32) came fifth and sixth respectively, while conflict at work was chosen by 4.9% (n=18) and level of support by 4.3% (n=16). Clinical duties was chosen by 3.0% (n=11) and a lack of educational opportunities by 1.9% (n=7). The 'other' option, with space for a free text response was chosen by 3.0% (n=11). Free text responses included complaints management, overnight/on-call shifts, shared consultation rooms, lack of promotional and career advancement opportunities, lack of recognition for a job well done, and 'all of the above'.

The two most popular answers for this question in the combined sample were workload and non-clinical duties, and this is mirrored in the samples from both Pakistan (22.9%, n=19; and 20.5%, n=17 respectively) and South Africa (32.9%, n=25; and 14.5%, n=11 respectively).

However, for the Malaysian sample the two most popular answers were non-clinical duties (29.0%, n=40) and understaffing (17.4%, n=24), for the Sri Lankan sample they were inadequate salary (29.7%, n=11) and workload (27.0%, n=10), and for the Zambian sample they were workload (29.7%, n=11) and lack of adequate resources (24.3%, n=9). Of note, workload was one of the top two answers for all countries.

Results also varied according to gender and age group. The top two answers for men, and women were the same: workload and non-clinical duties, however, while workload was the most popular answer for men (23.7%, n=32), for women it was non-clinical duties (22.9%, n=44). For the group that did not disclose gender the most popular answer was workload (29.5%, n=13), followed by understaffing (13.6%, n=6). The third most popular answer was different for all groups. For men, it was inadequate salary (15.6%, n=21), for women, work/family conflict (11.5%, n=22) and for the gender undisclosed group it was non-clinical duties (11.4%, n=5). The single most stressful factor also varied across age groups with workload, again being the most popular answer for the 20-29 age group, (50.0%, n=12); the 40-49 age group (24.4%, n=30); and the 50+ age group (23.8%, n=10), while non-clinical duties were the most popular answer for the 30-39 age group (24.6%, n=43). The second most popular answer for the 20-29 age group was lack of adequate resources (12.5%, n=3), while for the 30-39 age group it was workload (18.9%, n=33), for the 40-49 age group it was non-clinical duties (22.8%, n=28) and for the 50+ age group it was understaffing and a lack of adequate resources (for each: 16.7%, n=7). See Tables 6.11, 6.12, and 6.13 for the full breakdown of results, with the most popular answers in bold.

Table 6.11 'What single aspect of your work do you find most stressful?'

Single most stressful factor	Combined dataset (n=371)		Pakistan (n=83)		South Africa (n=76)		Malaysia (n=138)		Sri Lanka (n=37)		Zambia (n=37)	
	n	%	n	%	n	%	n	%	n	%	n	%
Workload	86	23.2	19	22.9	25	32.9	21	15.2	10	27.0	11	29.7
Non-clinical duties	77	20.8	17	20.5	11	14.5	40	29.0	7	18.9	2	5.4
Understaffing	42	11.3	2	2.4	10	13.2	24	17.4	2	5.4	4	10.8
Inadequate salary	37	10.0	9	10.8	3	3.9	7	5.1	11	29.7	7	18.9
Lack of adequate resources	34	9.2	9	10.8	8	10.5	7	5.1	1	2.7	9	24.3
Work/family conflict	32	8.6	9	10.8	7	9.2	11	8.0	4	10.8	1	2.7
Conflict at work	18	4.9	3	3.6	4	5.3	9	6.5	1	2.7	1	2.7
Level of support	16	4.3	4	4.8	1	1.3	10	7.2	1	2.7	0	0
Clinical duties	11	3.0	2	2.4	4	5.3	5	3.6	0	0	0	0
Lack of educational opportunities	7	1.9	6	7.2	0	0	0	0	0	0	1	2.7
Other	11	3.0	3	3.6	3	3.9	4	2.9	0	0	1	2.7

Table 6.12 Breakdown by gender for the 'single most stressful factor'

Single most stressful factor (n=371)	Male (n=135)		Female (n=192)		Did not disclose gender (n=44)	
	n	%	n	%	n	%
Workload	32	23.7	41	21.4	13	29.5
Non-clinical duties	28	20.7	44	22.9	5	11.4
Understaffing	17	12.6	19	9.9	6	13.6
Inadequate salary	21	15.6	12	6.3	4	9.1
Lack of adequate resources	12	8.9	19	9.9	3	6.8
Work/family conflict	7	5.2	22	11.5	3	6.8
Conflict at work	4	3.0	10	5.2	4	9.1
Level of support	3	2.2	11	5.7	2	4.5
Clinical duties	1	0.7	7	3.6	3	6.8
Lack of educational opportunities	4	3.0	3	1.6	0	0
Other	6	4.4	4	2.1	1	2.3

Table 6.13 Breakdown by age group for the 'single most stressful factor'

Single most stressful factor (n=371)	20-29 (n=24)		30-39 (n=175)		40-49 (n=123)		50+ (n=42)		Did not disclose age (n=7)	
	n	%	n	%	n	%	n	%	n	%
Workload	12	50.0	33	18.9	30	24.4	10	23.8	1	14.3
Non-clinical duties	2	8.3	43	24.6	28	22.8	3	7.1	1	14.3
Understaffing	0	0	20	11.4	13	10.6	7	16.7	2	28.6
Inadequate salary	2	8.3	17	9.7	12	9.8	5	11.9	1	14.3
Lack of adequate resources	3	12.5	19	10.9	5	4.1	7	16.7	0	0
Work/family conflict	2	8.3	17	9.7	11	8.9	1	2.4	1	14.3
Conflict at work	1	4.2	7	4.0	8	6.5	2	4.8	0	0
Level of support	1	4.2	6	3.4	7	5.7	2	4.8	0	0
Clinical duties	1	4.2	7	4.0	2	1.6	0	0	1	14.3
Lack of educational opportunities	0	0	3	1.7	3	2.4	1	2.4	0	0
Other	0	0	3	1.7	4	3.3	4	9.5	0	0

6.4.2 'What single change at work would make the biggest difference to your stress levels'

Participants were also asked what single change at work would make the biggest difference to their stress levels and given a choice of nine options with 'other' as the tenth. A total of 364 participants responded to this question with better pay being the most commonly chosen response (21.2%, n=77), followed by better staffing levels (15.9%, n=58), and fewer non-clinical responsibilities (12.4%, n=45). More support was chosen by 10.7% (n=39), clearly defined role/expectations by 10.4% (n=38), and shorter work hours by 9.6% (n=35). Fewer patients, adequate resources, and better educational opportunities were least commonly chosen with responses of 7.4% (n=27), 5.5% (n=20), and 2.7% (n=10) respectively. 4.1% (n=15) of respondents chose 'other' with the option of a free text response. Free text responses included changes such as: improvements in overall economic conditions; allowing clinicians to concentrate on their clinical work; more focused management; changes in patient expectations regarding answers to emails and messages; changing workplace to be closer to family; providing adequate facilities for staff; promotional opportunities and input into policy decisions; and limiting the number of tasks.

Again, for this question there were differences between countries. In the Pakistan sample the two most popular responses were better pay (28.0%, n=23) and more support (13.4%, n=11), and in the Sri Lanka sample, almost half selected better pay (48.6%, n=18), followed jointly by more support and fewer patients (10.8%, n=4). Better pay was also the most popular answer for the Zambia sample (29.7%, n=11), followed by clearly defined role and expectations (18.9%, n=7). In the South Africa sample, the most popular response was shorter work hours (20.0%, n=15) followed by fewer patients (18.7%, n=14), for Malaysia

better staffing levels (26.3%, n=35) was followed by fewer non-clinical responsibilities (18.0%, n=24).

There were few differences in responses to this question between the gender groups, however the responses from women were more evenly spread between answers. Both men and women chose better pay as their most popular answer to this question (26.5%, n=36; and 16.3%, n=30 respectively), with the second most popular answer being better staffing levels. While the third most popular answer was also the same for men and women (fewer non-clinical responsibilities), for the group that chose not to disclose their gender, more support was the third most popular answer (18.2%, n=8). The most popular answer across age groups was also better pay, but for the 50+ age group more support was equally popular (17.5%, n=7). While for the 20-29 age group clearly defined role and expectations shared second place with shorter work hours (16.7%, n=4), the second most popular response from both the 30-39 age group, the 40-49 age group, and the group who did not disclose their age, was better staffing levels (17.2%, n=30; 16.8%, n=20; and 28.6%, n=2 respectively). See Tables 6.14, 6.15, and 6.16 for the full breakdown of results, with the most popular answers in bold.

Table 6.14 'What single change at work would make the biggest difference?'

Single change to make the biggest difference	Combined dataset (n=364)		Pakistan (n=82)		South Africa (n=75)		Malaysia (n=133)		Sri Lanka (n=37)		Zambia (n=37)	
	n	%	n	%	n	%	n	%	n	%	n	%
Better pay	77	21.2	23	28.0	4	5.3	21	15.8	18	48.6	11	29.7
Better staffing levels	58	15.9	7	8.5	12	16.0	35	26.3	2	5.4	2	5.4
Fewer non-clinical responsibilities	45	12.4	10	12.2	6	8.0	24	18.0	3	8.1	2	5.4
More support	39	10.7	11	13.4	5	6.7	16	12.0	4	10.8	3	8.1
Clearly defined role/expectations	38	10.4	8	9.8	7	9.3	15	11.3	1	2.7	7	18.9
Shorter work hours	35	9.6	8	9.8	15	20.0	7	5.3	3	8.1	2	5.4
Fewer patients	27	7.4	6	7.3	14	18.7	1	0.8	4	10.8	2	5.4
Adequate resources	20	5.5	3	3.7	8	10.7	4	3.0	0	0	5	13.5
Better educational opportunities	10	2.7	4	4.9	1	1.3	1	0.8	2	5.4	2	5.4
Other	15	4.1	2	2.4	3	4.0	9	6.8	0	0	1	2.7

Table 6.15 Breakdown by gender for ‘What single change at work would make the biggest difference?’

Single change to make the biggest difference (n=364)	Male (n=136)		Female (n=184)		Did not disclose gender (n=44)	
	n	%	n	%	n	%
Better pay	36	26.5	30	16.3	11	25.0
Better staffing levels	20	14.7	29	15.8	9	20.5
Fewer non-clinical responsibilities	15	11.0	25	13.6	5	11.4
More support	12	8.8	19	10.3	8	18.2
Clearly defined role/expectations	12	8.8	21	11.4	5	11.4
Shorter work hours	9	6.6	23	12.5	3	6.8
Fewer patients	15	11.0	10	5.4	2	4.5
Adequate resources	7	5.1	13	7.1	0	0
Better educational opportunities	5	3.7	5	2.7	0	0
Other	5	3.7	9	4.9	1	2.3

Table 6.16 Breakdown by age group for ‘What single change at work would make the biggest difference?’

Single change to make the biggest difference (n=364)	20-29 (n=24)		30-39 (n=174)		40-49 (n=119)		50+ (n=40)		Did not disclose age (n=7)	
	n	%	n	%	n	%	n	%	n	%
Better pay	6	25.0	37	21.3	23	19.3	7	17.5	4	57.1
Better staffing levels	2	8.3	30	17.2	20	16.8	4	10.0	2	28.6
Fewer non-clinical responsibilities	0	0	25	14.4	19	16.0	1	2.5	0	0
More support	3	12.5	18	10.3	11	9.2	7	17.5	0	0
Clearly defined role/expectations	4	16.7	15	8.6	13	10.9	6	15.0	0	0
Shorter work hours	4	16.7	21	12.1	7	5.9	2	5.0	1	14.3
Fewer patients	3	12.5	11	6.3	10	8.4	3	7.5	0	0
Adequate resources	0	0	14	8.0	4	3.4	2	5.0	0	0
Better educational opportunities	2	8.3	1	0.6	5	4.2	2	5.0	0	0
Other	0	0	2	1.1	7	5.9	6	15.0	0	0

6.5 Associated factor analysis

Chi-squared tests of independence (with Yates Continuity Correction) and Fisher's exact tests were performed to assess the relationship between a range of variables (demographic, workload, work characteristics, and coping strategies) and burnout. See Table 6.17 for the full list of variables included.

Table 6.17 Full list of variables analysed to assess their relationship to burnout

Significant relationship with burnout ($p \leq .05$)	No significant relationship with burnout
1. Age group (20-29, 30-39, 40-49, 50+) 2. Past history or treatment of anxiety 3. Past history or treatment of depression 4. Years since medical school (0-10, 11-20, >20) 5. Often understaffed 6. Resources not always available 7. Autonomy at work 8. Conflict at work 9. Clearly defined work role 10. Treated fairly at work 11. Feel safe at work 12. Difficulty travelling to work 13. Work and home responsibilities do not conflict 14. Work offers opportunities for CPD 15. My manager is supportive 16. Turnover intention (I often think about leaving my work) 17. Colleague support helps cope with stress 18. Family support helps cope with stress 19. Manager support helps deal with work pressure 20. Coping strategy - exercise	21. Sex (male/female/no answer) 22. Relationship status 23. Have children 24. Main carer 25. Have a chronic illness 26. Have dependents 27. Regularly consume alcohol 28. Alcohol intake has increased in past year 29. Highest level of education 30. Years in current position 31. Work catchment area 32. Employment type 33. Average weekly hours 34. Number of nightshifts 35. Average number of weekend shifts 36. Patient load 37. Have additional duties (yes/no) 38. Number of additional duties 39. Second job 40. Voluntary work 41. My colleagues are not supportive 42. I often make decisions at work I do not feel sufficiently expert to make 43. Increased workload during the Covid pandemic 44. Outside interests help me to cope 45. Coping strategy - volunteering 46. Coping strategy - hobbies 47. Coping strategy - socialising

Sample sizes differed for each variable due to missing data. The null hypothesis was that there was no relationship between each of the variables and burnout. Results showed that there was a statistically significant association between burnout and 20 out of the 47 variables tested. These included the demographic variables: age group, $\chi^2 (3, N=438) = 14.03, p = .003$; and years since completing medical school, $\chi^2 (5, N=445) = 14.33, p = .01$; the workload variable: being understaffed at work, $\chi^2 (1, N=440) = 4.82, p = .03$; and several work characteristics variables including: necessary resources not always available, $\chi^2 (1, N=437) = 7.14, p = .008$; conflict at work, $\chi^2 (1, N=439) = 21.98, p < .001$; conflict between work and home responsibilities $\chi^2 (1, N=443) = 24.54, p < .001$; supportive managers, $\chi^2 (1, N=366) = 26.17, p < .001$; and difficulty travelling to work $\chi^2 (1, N=449) = 6.15, p = .01$. Turnover intention, assessed using the question “I often think about leaving my job”, was also significantly associated with burnout, $\chi^2 (1, N=434) = 57.90, p < .001$; as was the coping strategy of exercise, $\chi^2 (1, N=373) = 4.68, p = .03$. Table 6.18 details the full results for variables with a significant relationship with burnout. Detailed chi-squared analysis was also conducted on country and gender groups to investigate country and gender level differences. However, due to small sample sizes these results, presented in Appendix L, must be interpreted with caution.

Table 6.18 Variables with a significant relationship to burnout – combined dataset.

Category	Variable	N	Chi-squared ¹⁵	df	P value (≤ 0.05)	Cramer's V
Demographic variables	Age group (20-29; 30-39; 40-49; 50+)	438	14.03	3	.003	0.179
	Years since completing undergraduate medical school (0-10; 11-20; >20)	445	7.767	2	.02	0.132
						phi
	I have been diagnosed with or treated for anxiety	431	6.17	1	.01	0.127
	I have been diagnosed with or treated for depression	431	4.32	1	.04	0.107
Work-related variables	We are often under-staffed at work	440	4.82	1	.03	-0.112
	The resources I need to carry out my duties are not always available	437	7.14	1	.008	-0.134
	Work offers me opportunities for continuing professional education	437	10.27	1	.001	0.159
	I have a clearly defined role at work	442	11.94	1	.001	0.170
	I am treated fairly at work	432	14.99	1	<.001	0.192
	I feel safe at work		17.56	1	<.001	0.206
	I have the autonomy to make decisions in my workplace, such as how to structure my schedule	436	19.75	1	<.001	0.218
	My manager is supportive of me at work	366	26.17	1	<.001	0.274
	There is often conflict at work	439	21.99	1	<.001	-0.229
	My work and home responsibilities do <u>not</u> conflict	443	24.54	1	<.001	0.241
	I have difficulty travelling to work	449	6.15	1	.01	-0.122
	The support of my colleagues helps me to cope with work stress	427	9.86	1	.002	0.158
	Family support helps me to cope with the pressure of work.	440	8.26	1	.004	0.144
Coping	Manager support helps me to deal with the pressures of work	387	19.00	1	<.001	0.228
	Use exercise as a coping strategy	373	4.68	1	.03	-0.119
Turnover intention	I often think about leaving my job	434	57.90	1	<.001	-0.371

¹⁵ Chi-squared with Yates continuity correction for those variables with df=1

6.6 Poisson regression analysis

Results for the hierarchical Poisson regression analysis (imputed data) are as follows. In Model 1 (demographic variables), the 50+ age group variable was independently inversely associated with burnout (IRR, 0.79; 95%CI 0.65 – 0.95; $p = .01$). In Model 2 (demographic + workload) the 50+ age group (IRR, 0.80; 95%CI 0.67 – 0.96; $p = .02$) remained inversely associated with burnout, and the 40-49 age group (IRR, 1.05; 95%CI 1.02 – 1.09; $p = .004$) became independently positively associated with burnout, along with working an average of more than 50 hours per week (IRR, 1.12; 95%CI 1.04 – 1.19; $p = .002$) and agreement with the statement ‘we are often understaffed at work’ (IRR, 1.14; 95%CI 1.02 – 1.28; $p = .02$). However, in Model 3 (demographic + workload + work characteristics) the only remaining variables independently positively associated with burnout were working an average of more than 50 hours per week (IRR, 1.06; 95%CI 1.01 – 1.11; $p = .03$) and agreement with the statement ‘there is often conflict at work’ (IRR, 1.12; 95%CI 1.00 – 1.27; $p = .05$), while manager support (IRR, 0.82; 95%CI 0.74 – 0.91; $p < .001$) and agreement with the statement ‘my work and home responsibilities do not conflict’ (IRR, 0.82; 95%CI 0.74 – 0.92; $p = .001$) were independently inversely associated with burnout. In this final model, those working more than 50 hours per week were 6% more likely to be burnt out, while those agreeing with the statement ‘there is often conflict at work’ were 12% more likely to be burnt out. Those who felt they had a supportive manager and those whose work and home responsibilities did not conflict were 18% less likely to be burnt out. See Table 6.21 for the full results.

The results from the original dataset are included in Appendix M as a sensitivity analysis. The following differences were noted: in the original dataset in Model 1 the 30-39 age group, (IRR, 0.91; 95%CI 0.85 – 0.98; $p = .02$) was inversely associated with burnout in addition to the 50+ age group (IRR, 0.73; 95%CI 0.59 – 0.89; $p = .002$). In Model 2 for the original

dataset, both age groups remained inversely associated with burnout (IRR, 0.91; 95%CI 0.83 – 0.99; $p = .03$; and IRR, 0.74; 95%CI 0.56 – 0.98; $p = .03$, respectively), along with working >50 hours per week (IRR, 1.11; 95%CI 1.04 – 1.18; $p = .001$) and understaffing (IRR, 1.18; 95%CI 1.04 – 1.35; $p = .01$), significant for both datasets. In Model 3 the main differences in results between the imputed dataset and the original dataset were that in the original dataset, working >50 hours per week was no longer associated with burnout, however a lack of autonomy was independently positively associated with burnout (IRR, 1.13; 95%CI 1.00 – 1.27; $p = .05$).

Table 6.19 Results of the Poisson regression analysis for the imputed data

Burnout	Model 1			Model 2			Model 3		
	IRR	95%CI	<i>P</i> ($\leq .05$)	IRR	95%CI	<i>P</i> ($\leq .05$)	IRR	95%CI	<i>P</i> ($\leq .05$)
sex									
female	1.04	0.93 – 1.17	.52	1.06	0.96 – 1.17	.26	1.01	0.89 – 1.14	.91
Age group									
30-39	0.97	0.91 – 1.04	.44	0.98	0.92 – 1.05	.53	0.96	0.89 – 1.03	.26
40-49	1.04	0.99 – 1.08	.09	1.05	1.02 – 1.09	.004	1.04	0.92 – 1.17	.51
50+	0.79	0.65 – 0.95	.01	0.80	0.67 – 0.96	.02	0.82	0.65 – 1.04	.10
Years since medical school									
10-20	0.94	0.89 – 1.03	.21	0.96	0.90 – 1.01	.14	1.00	0.92 – 1.08	.96
>20	0.93	0.81 – 1.05	.24	0.94	0.83 – 1.07	.36	1.00	0.83 – 1.20	.98
Education									
Postgrad exams or cert/dip	1.03	0.89 – 1.18	.70	1.02	0.88 – 1.18	.78	1.05	0.89 – 1.23	.55
Masters or PhD	0.95	0.88 – 1.03	.21	0.98	0.90 – 1.06	.54	1.02	0.91 – 1.13	.77
Daily patient numbers									
15-35				1.07	0.86 – 1.32	.57	1.03	0.86 – 1.23	.73
>35				1.15	0.92 – 1.42	.22	1.06	0.84 – 1.35	.61
Weekly hours									
41-50				1.06	0.99 – 1.13	.07	1.01	0.93 – 1.09	.85
>50				1.11	1.04 – 1.19	.002	1.06	1.01 – 1.11	.03
We are often understaffed									
Agree				1.14	1.02 – 1.28	.02	1.07	0.96 – 1.19	.22
Resources not available									
Agree							1.05	0.86 – 1.27	.64
Work offers opportunities for CPD									
Agree							0.98	0.87 – 1.09	.66
Clearly defined role									
Agree							1.00	0.91 – 1.09	.97
Treated fairly									
Agree							1.01	0.87 – 1.18	.89

Safe at work Agree							0.95	0.83 – 1.09	.46
Autonomy at work Agree							0.90	0.80 – 1.00	.06
Colleagues not supportive Agree							1.02	0.90 – 1.15	.77
Manager is supportive Agree							0.82	0.74 – 0.91	<.001
Often conflict at work Agree							1.12	1.00 – 1.27	.05
Work and home responsibilities do not conflict Agree							0.82	0.74 – 0.92	.001

6.7 Summary

Key findings included a very high prevalence of high scores for burnout across all five LMICs, with Zambia having the highest prevalence. Prevalence of burnout also varied according to gender and age group. The chi-squared test of independence and Fisher's exact test identified 20 variables, from demographic, to workload, to workplace characteristics, that had a statistically significant relationship with burnout. Associated factors varied by gender and by country although country specific results, especially for Sri Lanka and Zambia, should be interpreted with caution due to small sample sizes. Finally, the regression model demonstrated that when demographic, workload, and workplace characteristics variables were combined across the complete dataset, working more than 50 hours a week and conflict at work were statistically significant risk factors for high burnout scores, while manager support and a lack of conflict between work and home responsibilities were statistically significant protective factors. In the next chapter the findings from the qualitative study are presented and integrated with these quantitative findings.

This, the second of two results chapters, will present the results of the thematic analysis of the data from the 33 semi-structured interviews combined with the data from the three open ended questionnaire items from the online survey described in chapter 5 and included in Appendix I. The focus of the interviews and the open questions was to address the second and third objectives of this thesis: to identify factors associated with burnout, including risk factors and/or protective factors in FPs in LMICs; and to explore factors related to work-related stress and burnout in FPs in LMICs. Factors associated with burnout were explored in the interviews using the framework of the job demands–resources (JD-R) model of burnout which posits that burnout results from an imbalance of demands and resources (for details of the JD-R model see chapter 3, section 3.2.4). In addition, consequences of burnout and coping strategies were explored as part of the experience of burnout.

The first section of this chapter will present the demographic characteristics of the interview participants, the second a summary of the themes and sub-themes that were found, and the third a summary of the participants views on work-related stress and burnout. Following this, the results will be presented in sections reflecting the objectives and organised according to the four themes found from the data. These four themes were ‘demands’, ‘resources’, ‘living with workplace stress and burnout’, and ‘coping strategies and possible solutions’. Sections 7.4 and 7.5 will present the findings related to factors that may be associated with burnout in terms of the demands experienced by participants and the resources available to balance those demands in line with the JD-R theory of burnout, providing insight into the imbalance of demands and resources that may underlie the development of burnout. The absence of a resource may be perceived as a demand therefore there is some interaction between these

two themes. Following this section 7.6 will present the findings relating to ‘living with workplace stress and burnout’ and section 7.7 will present the findings related to the theme ‘coping strategies and possible solutions’. Where demands, challenges, or stressors (including work-related stress) are discussed in this chapter, this is as possible contributors to the development of burnout as per the JD-R conceptual framework for burnout which posits that burnout develops as a result of an imbalance between the demands on a worker and the resources available to that worker. The chapter will conclude by integrating the quantitative and qualitative results and summarising the key findings. Of note, the code allocated to each interview participant combines a number with letters identifying the participant’s country: Pakistan is identified with ‘P’, South Africa with ‘SA’, Malaysia with ‘M’, Sri Lanka with ‘SL’, and Zambia with ‘Za’.

7.1 Characteristics of participants

Semi-structured interviews were completed with 33 participants. This was comprised of four participants from each of Pakistan, Malaysia, and Sri Lanka, eight participants from Zambia and 13 from South Africa. Five of the 33 interviews were email interviews. A further six physicians booked interviews but failed to attend and did not respond to follow-up emails. All participants had high scores on one or both of the burnout measurement tool subscales (exhaustion subscale score ≥ 2.25 ; disengagement subscale score ≥ 2.1). Participants were evenly divided by gender with 16 men and 17 women participating, of which the majority (n=24) were married/co-habiting or in a relationship, four were single, three were divorced, and the remaining two chose not to disclose their marital status. There were 15 participants from the 30-39 age group and 12 from the 40-49 age group. The 50-59 age group was represented by 4 participants and the youngest age group (20-29) and oldest age group (60

and over), were each represented by a single participant. A majority of 18 worked in an urban catchment, while six worked in a rural catchment and nine worked in either a semi-urban catchment or a combination of urban and rural catchments. In terms of employment sector, 19 worked solely in government postings, six combined government posts with private work, five worked solely in the private sector, and three worked in the NGO or private non-profit sector. All the participants from Pakistan, South Africa, Malaysia, and Sri Lanka were working as specialist FPs or family medicine registrars for at least part of their work. Three of the eight participants from Zambia were working as specialist FPs or family medicine registrars and the remaining five were working for at least part of their work as general medical officers seeing any age patient for any medical condition. See Table 7.1 for a summary.

Table 7.1 Characteristics of interview participants

Characteristic		Number (n)
Country	Pakistan	4
	South Africa	13
	Malaysia	4
	Sri Lanka	4
	Zambia	8
	Total	33
Mode of interview	Videoconferencing	28
	Email	5
Gender	Male	16
	Female	17
Marital status	In a relationship	24
	Single or divorced	7
	Did not disclose	2
Age group	20-29	1
	30-39	15
	40-49	12
	50-59	4
	60+	1
Catchment area	urban	18
	rural	6
	Semi-urban or combination	9
Employment sector	Government	19
	Private	5
	NGO/private non-profit	3
	Both	6
Job role	FP or FP registrar	28
	General Medical Officer	5

7.2 Themes and sub-themes

Analysis of the interview data combined with data from the open-ended questionnaire items resulted in four themes: ‘demands’, ‘resources’, ‘living with workplace stress and burnout’, and ‘coping strategies and possible solutions’. The ‘demands’ and ‘resources’ themes were broad and complex and thus the data within each was organised into six sub-themes. The themes ‘living with workplace stress and burnout’ and ‘coping strategies and solutions’ were

also broad, and each was divided into three sub-themes. See Table 7.2 for details of the themes and sub-themes that were identified through analysis of the data.

Table 7.2 Themes and sub-themes

Themes	Sub-themes
Demands	Workload Conflict Patient factors Work-related travel Systems and regulation Socioeconomic and political factors
Resources	Essential supplies, services, and staffing Community Career development and training opportunities Motivation and values Reward Work-life balance
Living with workplace stress and burnout	Consequences of workplace stress Understanding and experience of burnout Stigma of burnout
Coping strategies and possible solutions	Personal Relational Work-related

7.3 Participant views on work-related stress and burnout

All participants viewed work-related stress as a precursor to burnout. When asked about their understanding of burnout, most understood burnout to be the culmination of excessive, prolonged, or chronic work-related stress:

“So, it's um, it's excessive stress. Excessive stress. Maybe prolonged stress and exhaustion.” (Male, Za06)

“when you engage in a certain thing for a long, long period, you just get tired and you do not want to do it and you just want to stop it and probably you get, uh stressed more and more...” (Male, SL01)

“Burnout is a physical, emotional and spiritual exhaustion that results from stress and overwork...” (Male, SA05)

“feeling stressed all the time at work, and sometimes you will have physical symptoms like lethargy um, like, a poor appetite.” (Female, M01)

“burnout is a condition is a, is a product, a byproduct of a prolonged process of stress that you are unable to cope with.” (Female, M04)

Some described burnout as unrelieved work-related stress, and others as work-related stress without the opportunity for rest and recovery. Several viewed burnout to be the complete exhaustion that results from the stress of excessive workloads.

“Burnout I heard somewhere before, like you are totally exhausted. It happens. It happens for me (laughs). For me, I feel like it comes to me after every like three to four months and then I decide to take some off from my hospital, from my clinic...” (Male, P03)

In participant descriptions of the cause of burnout delineation was made between manageable stress, which many stated they felt every day and described as stress they could cope with or recover from, and high levels of stress that were overwhelming or unmanageable, that they could not cope with, viewed as burnout. All viewed the stressors and demands associated with work as important factors in the development of burnout, with

the difference between work-related stress and burnout being recognised as the intensity and chronicity of the stress rather than the nature of the stressor or demand. The term 'work-related stress' is used in this chapter to refer more generally to any stress associated with work demands. The more specific term 'burnout' is used when participants are referring to the situation where that work-related stress becomes unmanageable or chronic.

7.4 Demands

Demands are those negative aspects of work that require expenditure of effort and deplete energy (Bakker and Demerouti, 2007). The theme of 'demands' was divided into six sub-themes in order to better organise and represent the breadth and complexity of the data relating to demands and capture the nuances that are unique to LMICs. These sub-themes are as follows: workload; conflict; patient factors; work-related travel; systems and regulation; and finally, political, and socioeconomic factors. The following sub-sections will discuss each of these in turn.

7.4.1 Workload

Workload was a broad sub-theme encompassing a variety of different aspects of workload. Included in the concept of workload were hours worked, additional duties such as administration and management, and the impact of heavy workloads on home life and family responsibilities. The volume and complexity of the clinical workload and stressors specific to the nature of clinical work, such as the emotional impact of witnessing suffering and death were also discussed in relation to the demand of workload. Finally, participants spoke about the importance of autonomy and having some control over their workload. As this is a

complex sub-theme each of the aforementioned aspects of workload are discussed in more detail, with supporting text, in the following sub-sections.

7.4.1.1 Work hours and additional duties

Long hours appear to be the norm for most FPs. Most worked a combination of office hours and evening, overnight or weekend on-call hours. FPs in Pakistan and Sri Lanka often combined government jobs during the day with private practice in the evenings:

“...officially uh I am ah performing 48 hours duty in hospital which is uh mandatory for as a government servant and you can hmm add 48+ in the evening, then you can calculate this is (laughs) the workload on me.” (Male, P01)

In addition to their clinical workloads, most FPs have non-clinical duties such as management, administration, and teaching. For some, due to heavy clinical workloads, these non-clinical duties spill over into home life as there is inadequate time available to complete them during the working day:

“I have admin work to set over the weekend because every day I'm working seeing patients Monday to Friday and even if I'm on leave, uh people are still calling me because I'm in charge, I'm the head of the clinic...” (Female, M03)

For others, their home responsibilities are felt as an additional workload, competing with work for time and attention:

“Now, with the passage of time, you gain responsibilities more from family from because Pakistan has a joint family system. So, you have more responsibility from family, and you have also more responsibility from [patient] because your number of patient increasing and sometime they get some contact number from you maybe

relative maybe close friend so, so they always texting you or calling you or asking for some favour. So, I feel that as comparing with the past, I'm ah I'm almost always busy, that's why I have started switching off my mobile for some time.” (Male, P03)

One female participant described the stress of multitasking and felt the pressures of her non-clinical work responsibilities so acutely, that she noted:

“Seeing patients actually calm me down, yeah. Interestingly, seeing patients sometimes calm me down.” (Female, M02).

7.4.1.2 Patient volume and complexity

For many FPs, especially those in government posts, these long work hours are combined with an overwhelming volume of patients who have increasingly complex problems:

“Our hospitals, generally we’re over capacity between 120-130 percent full so we’ve a lot of patients sitting in chairs, and uh the burden of disease, South Africa call it the quadruple burden of disease, [but] it’s the child health, maternal health, it’s all the HIV, TB which is a big percentage of our clients, big burden of non-communicable diseases that we have to deal with so, there’s a lot of pressure on us and our primary care setting.” (Male, SA01)

In the face of this complex workload and because of the time pressure experienced many physicians become anxious that they are missing diagnoses or making errors in their management of patients, and this becomes an additional source of stress:

“...the stress comes when it's complicated or sometimes I feel I need to do so many things just to settle one patient or whether after come back and be thinking, thinking

about whether I did the right thing or maybe I didn't do right and those kind of things stress me out a bit..." (Female, M02)

Furthermore, when discussing their workloads, several participants spoke about their experiences during the COVID-19 pandemic, and the stresses they faced, not only in terms of long hours and overwhelming numbers of patients, but also in terms of the emotional impact of witnessing so much suffering and death. Although magnified during the pandemic, the stress of witnessing suffering and death is not unique to the pandemic and is an integral part of a physician's clinical workload. The impact this has on individual physicians may vary and may be influenced by a physician's own personal experiences of suffering and death:

"I managed a patient on my own that had a maternal death and just thinking about the instance makes me anxious and sad. She passed away exactly on the same date as what my mother passed away on, and I was thinking about her a lot on that day, so seeing a maternal death that day was really sad for me." (Male, SA09)

And finally, related to the demand of clinical complexity and the nature of clinical work is the stress of the risk of infection. This is especially so in settings where there is a high prevalence of communicable diseases, perhaps combined with a lack of adequate supplies and equipment to manage patients appropriately. A lack of adequate basic resources will be discussed further in the following section on the theme of resources. Although sometimes mentioned in the context of the pandemic, the risk of infection was also discussed as an ongoing stress in relation to other communicable diseases:

"...it does add to my worry because right now on my ward I actually have one with hepatitis B, but you, you, you see the, the care is not the way it's supposed to be, because it, we have even things to use as well on these patients we don't have it... So,

it's actually [*unclear*] because I'm thinking, what if I get these diseases and I take them to my, to my child, my wife at home, so there's all that.” (Male, Za06)

7.4.1.3 Autonomy and control

Finally, in relation to workload, autonomy, and a degree of control over the workload was discussed both positively where participants felt they had the freedom and authority to plan and influence their workload, and negatively where participants felt that they had no control over their daily workload stresses. The absence of autonomy and control was discussed as a stressor and demotivator especially with regard to making changes:

“...these impact me negatively - increased stress as I feel partly that it is my responsibility to fix these things but do not have the authority or position to do so.”
(Male, SA05)

However, several participants appreciated the autonomy that they had, and recognised the value of having some control over their workload:

“...currently I'm quite privileged because I'm under the registrar contract so, ah my, my site supervisor here, um, in light of that, has given me quite free rein to say I want to structure my day as follows. I mean they still want me to see patients, but I, I have quite a lot of freedom.” (Male, SA10)

7.4.2 Conflict

Also, within the theme of demands, participants acknowledged workplace conflict as a stressor and spoke about two different categories of workplace conflict: conflict with

colleagues; and conflict with patients and patient relatives. These will be discussed in the following sub-sections.

7.4.2.1 Conflict with colleagues

Conflict with colleagues was frequently mentioned as a stressor, often in the context of management responsibilities. Conflict resolution and dealing with staff complaints was discussed as an integral part of the management role, and 'people management' referred to as a significant stressor. Several participants specifically referred to conflict arising from managing older, more experienced colleagues who may be resistant to change:

"I think uh, as a family physician, people management. Um, so uh I am the line manager to all the doctors working at my facility, um, and I think um, I do have a, the, some of the medical officers are a lot older than I am and do have more years of experience. So, I find it quite difficult um to, to manage the older colleagues. Um those who are, um you know, set in a specific way of doing things, set in a specific way of practising medicine." (Female, SA07)

Others spoke about conflict with their colleagues as peers, rather than in a management context. They discussed different sources of conflict including conflict arising from differences in work ethic and performance:

"...sometimes it frustrates me that many arrive late, then spend 30-45 min having coffee before seeing patients and are mostly leaving by 3pm. And yet there are patients being turned away because they arrived to queue at the clinic at 7am and are told that the clinic is full. And even those who make it inside are not always treated properly." (Male, SA05)

Other differences such as gender and cultural differences also gave rise to conflict. One female participant from South Africa discussed her experiences of conflict with colleagues in terms of gender bias and discrimination "...with a boss that, um doesn't like females believes they can't cope as well as males" (Female, SA12). Another participant, working in Zambia but not from Zambia originally, experienced conflict with colleagues arising from perceived cultural differences:

"Yes, cultural difference. I think cultural difference. At times, microaggressions to all that could be there. Because of culture or because of difference of, of accent, for instance, or an opinion." (Female, Za02)

Interestingly, conflict was discussed as both a stressor and a consequence of stress. The more stressed staff are the more likely conflict will arise, leading to more stress. Conflict arising as a consequence of the stress of heavy workloads was expressed by a participant from South Africa:

"And then also I think conflict in the workplace. I think the fact that um the, the doctors are working so hard, and they are seeing, you know, in excess of 30 patients a day, um, they do get tired and they, they do um sometimes feel like they're at the point of burnout and... Um, you know, sometimes they get a little bit snappy and, and I mean, I've been there a few years ago myself." (Female, SA07)

And echoed by this participant from Zambia:

"But the, the, the issue now is when we are working with people who are really stressed, OK, it becomes now another problem because yeah. So, we can have those more conflict which can arise." (Male, Za04)

The underlying causes of conflict between colleagues are complex and include conflict arising from the management role as well as personal differences. Notably, while being a stressor,

workplace conflict was also described as a consequence of stress leading to a vicious cycle where conflict leads to stress and stress to more conflict.

7.4.2.2 Conflict with patients

Participants also spoke about conflict with patients, and relatives of patients. This was often discussed in the context of a lack of basic medical resources, or from the impact of understaffing on waiting times. Patients were described as ‘demanding’ in the face of limited resources, or ‘aggressive’ when resources were not available. A participant from Pakistan related an example of conflict arising from a shortage of ambulances:

“Sometimes we will see the emergency patient, the patient has an MI, so we, we, we gave him acute coronary syndrome treatment, and uh, uh, and I’m referring the patient and I’m telling that uh we are only one ambulance and the, the, the ambulance has gone, has taken the other patient, so he start fighting with me, why you do not have another ambulance...” (Male, P01)

Participants spoke about how patient complaints and conflict over long waiting times led to physicians working longer hours or going without breaks in order to manage the patient load and defuse the conflict. Frustration over limited resources and system failures sometimes escalated from complaints to threats and violence:

“So, um, violence, yes, we’ve been threatened with violence from our, from the community, from the patients um. Particularly on days where we are very short staffed, and we can only take in a specific amount of patients.” (Female, SA07)

Despite the seriousness of patient conflict, discussed in terms of aggression and violence, some participants felt that, in view of the long-term working relationship required with colleagues, conflict with colleagues was the greater challenge:

“But I think what makes it, I think what almost makes it less challenging is that this is a patient I'll see once, maybe twice, but it's not someone that I'm going to have a long-term working relationship with.” (Female, SA07)

Clearly, workplace conflict, with both colleagues and patients, is a considerable demand for FPs. In the case of colleagues, the sources of conflict are varied and may arise from the challenges of the management role as well as personal differences, however the majority of patient conflict appears to be driven by patient expectations in the face of limited resources.

7.4.3 Patient factors

Physicians spend much of their work time with patients and as such these interactions can be demanding and may have a significant impact on a physician's well-being. Although patient factors relating to workload and conflict have been discussed previously, this section will discuss additional patient factors such as doctor-patient communication, patient health beliefs, patient compliance, and the challenges of managing patient expectations.

Doctor-patient communication may be more challenging in communities where there are lower levels of education, especially health education, and where patients may not have the words, even in their local language, to adequately describe their symptoms. These difficulties are not only frustrating for both patient and doctor, but have the potential to negatively impact quality of care:

“And other patient came from, to me, she was 22 years old, she uh didn't explain her problem or sign, symptoms. This is the big problem of our population. We are the, a female especially cannot explain the actual problem... The old people, like 60, 70-year-old persons, came to me, came also, have a big problem to explain their actual sign and symptoms. Then I use my local language and local traditional words.” (Male, P02)

Several participants identified education level as a key factor affecting doctor-patient communication, and discussed the challenge of varying literacy levels within their communities and the impact at an individual level on a doctor's ability to counsel a patient:

“Ah, yes ma'am, actually the education here in our country, Pakistan, is not that much uh. The literacy rate is uh, uh not that much high so the counselling of the patients it, it's a bit difficult ma'am because most of the patients they are not ah literate, so I would like if uh if our education system and that's more improved the people are more educated so it would be very much easy for us to counsel them.” (Male, P04)

Several participants from Pakistan stated that illiteracy was one of the biggest challenges facing FPs in their country, and one described the levels of illiteracy as “most distressing” (Male, P01). Others felt that they needed better resources for health education to bridge the communication gap between patient and doctor:

“Ah, all I ah need resources that ah very clearly for me to understand my patient and are my, my patient and as well as I understand their problems. I need these types of resources which is a very simple and very clear.” (Male, P02)

Patient health beliefs were discussed by participants from Pakistan, Malaysia, and South Africa, including traditional health beliefs, 'anti-vaxxer' health beliefs, and pandemic conspiracy beliefs. Patient health beliefs that conflicted with the doctors own medical beliefs

were perceived as challenging and stressful especially when they negatively impacted patient care or compliance. Participants from Pakistan spoke about the traditional health beliefs held by patients and the need to try and educate them about the causes of disease:

“...because the people thinks that we are not, we are getting the disease because of bad evil eye. I am telling them that there is a role of evil eye but this, this universe is running because of nature.” (Male, P01)

They also spoke about traditional health beliefs being perpetuated by unqualified and unregistered ‘doctors’ (participants used the term ‘quacks’) with significant consequences for patients:

“...they misguide the patient that this stroke is not because of hypertension, this is because of some bad eye but some, we will give you some injection, some, some, sort of [*unclear*] you will recover, and the patient will go to the uh, uh, longstanding complications like uh, a patient that is having, developing MI, or stroke, or renal failure or, and the quack said that the patient is ok...” (Male, P01)

Participants also discussed patients’ health beliefs specifically relating to vaccinations and pandemic conspiracy theories, and how these beliefs affect patient compliance with medical advice:

“During my consultations, maybe I'll just go one by one, um I find it a bit stressful when patients don't really bother about um our advice. Let's say we advise them about even simple things like COVID vaccination, and then there's a lot of anti-vaxxers that, that, that is very stressful. If you just see one anti-vaxxer one day your whole day is gone so like, uh, your mood is ruined, you know, or a parent that refuse vaccination for their baby, newborn baby, you know...” (Female, M01)

Finally, managing patient expectations can also be a challenge for FPs, especially in resource limited settings when those expectations arise out of a patient's lack of understanding of what is needed or what is possible. A participant from Zambia expressed this challenge as a 'burden':

"So, we have carrying a very big burden on ourselves to try and convince the community that we are doing our best despite the little resources that we have, yeah." (Male, Za05)

In the private sector where there may be more resources available another challenge comes in managing the patient who attends with preconceived ideas about what they want or need, and an expectation that the physician will deliver whatever they want because they are paying for it:

"We, we have patients who do, I mean patients who would come to the practice with a list of things which they want done. But most of all, things are not rational. They are not indicated. They would want this test done, that test done, or this uh thing tried. Some of which they have either read on online or they are just experimenting so they, you find that it that conflicts with what is possible, and eh what is the best practice." (Male, Za07)

Others spoke about the stress of managing patient expectations when there was little understanding of what their medical insurance (Medical Aid) would cover or how much paperwork was involved in making the claim and recouping expenses:

"Yes, and they have no idea, patients have absolutely no idea that, how little the medical aid pays, all the paperwork that's involved, they just think um, you know once or twice I've just had, went on a tangent and I got, you know, had a meltdown, and tell the patient and they said, they, they had no idea, and I can't explain to every

patient that um there's just unrealistic expectations that they have from the medical aids yah." (Female, SA06)

These patient factors, communication difficulties often due to poor levels of education, alternative health beliefs, compliance, and managing patient expectations constitute significant demands for the FP. Some of these factors may also lead to the conflict discussed previously, demonstrating the inter-relatedness of many of these demands.

7.4.4 Work-related travel

Work-related travel constitutes another demand for FPs in LMICs and was discussed by several of the participants both in terms of driving conditions and distances travelled. Participants spoke about the stress of busy commutes and having to leave home very early to avoid heavy traffic. They spoke of the stresses of heavy traffic, combined with dangerous driving practices and poor infrastructure such as malfunctioning traffic lights:

"...it's quite um mentally taxing. So, by the time you get to work you, you, you really feel a little bit tired just for that 45-minute journey to work, trying to dodge and trying to make sure you're not running anyone over or trying to make sure, you know, you actually when you get to the, to the deficient traffic light or the defective traffic light, that you actually driving at the time you should be driving..." (Female, SA07)

Some worked in more socially deprived and dangerous areas and thus, for reasons of personal safety, lived a significant distance away from work, leading to a long and stressful commute. Others, in government assigned posts, worked 100 kilometres or more from home, and spoke of long working days with the addition of long travel hours, as well as concerns about safety on the roads. Participants from Malaysia spoke of mandatory government postings to more remote areas sometimes many hundreds of miles away from

their personal support networks of family and friends. Not only is this relocation stressful in itself, but the distance from personal support networks removes an important resource:

“...sometimes it's a bit difficult. So, finding a friend at this point of time and where I came here, um yeah, from far away, just being in [name] because I was posted here, like we in Malaysia, once we become a family physician the rule somehow is uh you have to be posted to either Sabah or Sarawak... So that that becomes an issue. So, friends are also all away family also all away. So, when you come to new place to find a friend in a new place is rather be difficult...” (Female, M02)

For other participants, travelling to oversee community clinics was a requirement of their role and resulted in a significant amount of extra travel. This led to long days, leaving home before dawn to get to clinics in time, and arriving home late at night. Participants in Zambia spoke of the additional stress of trying to visit clinics in the rainy season when roads can become impassable. Moreover, other factors such as the cost of fuel, or suffering from motion sickness can exacerbate the stress of work-related travel:

“It's, it's really tiring, you know, and sometimes I can also develop a kind of, you know, motion sickness. So that is why I don't like travelling a lot. But again, the job I have, I have to travel a lot.” (Male, Za04)

Although several participants did not report difficulties with work-related travel or lived close enough to work to walk to work, travel was a significant stress for others. Work-related travel stress encompasses a variety of different situations from the daily commute; to the stresses of travelling to visit outlying clinics especially when road conditions are poor; to the stress of mandatory relocation.

7.4.5 Systems and regulation

Also discussed as a source of stress for physicians was the need to work within overly bureaucratic and hierarchical systems and the difficulties experienced trying to get things done and navigating excessive red tape. Participants described unnecessary interference from District or other higher-level management, or contrastingly a lack of appropriate involvement of higher management. They also described a lack of coordination within leadership and management; 'broken' referral systems; poor communication between departments and facilities; system inefficiencies; inadequate governance; and overall, a health system 'falling apart' with little support from the Ministry of Health or government. For some it was the added bureaucracy of private medical insurance and the demands on the FP for additional paperwork and the complexity around what is, and what is not covered. Others spoke about the difficulties of obtaining necessary supplies and the bureaucracy of government systems for ordering:

"Then the, this bureaucratic system of ordering instruments um of, via a, a, a system from an administration that's sitting in another city, um and you don't get what you, what you really need." (Female, SA08)

In several of these countries the primary care system is not well developed, and this was also described as a source of stress and frustration:

"And also, I want to equally treat each and every patient but there is no system as such in our country because you know there is no organised general practice system." (Male, SL01)

As was the frustration of poorly coordinated patient care:

"Then you have also a system which is, I would call it, dysfunctional to some extent, in the sense that it, there, there is no coordination the, the coordination of care is not

there in the government sector, because if the patients are seen like on a conveyor belt, you see a patient today. Tomorrow, you see another one. The other day you see. So, there's no real continuity of care.” (Male, Za07)

Finally, one participant attributed the ‘failed system’ to a lack of resources for dealing with the multidisciplinary issues faced by their patients:

“...when you look at a patient it’s multidisciplinary, it's, you have to look at the, the social circumstances, you have to look at the mental, um and then it's, it's failed as a system, it’s failed, there isn't resources...” (Female, SA06)

All the interview participants from Malaysia and many of those answering the free text question on the questionnaire about the biggest challenges faced by their country, described the system in Malaysia, where Primary Care sits under the purview of the Public Health Department, as a source of stress and conflict. Participants felt that the public health focus on population health conflicted with the FP emphasis on the individual. In addition, they felt that the expectations on them with regard to public health programmes within primary care were unreasonable and some participants felt that public health practitioners simply did not understand the importance of clinical medicine.

“Most stressful for now is um, I think to get the public health part to understand the importance of um the clinical work. Um, because um some of them are training as epidemiologists...” (Female, M04)

Regulatory frameworks, as part of wider health systems, were also a source of stress. Participants discussed the lack of regulation for pharmacies and prescribing where patients can simply request and buy antibiotics and other drugs without prescription. This can create extra work for physicians if patients are inappropriately self-medicating. In addition, Participants from both Pakistan and Sri Lanka spoke of ‘quacks’, using the term to describe

unqualified or illegally practising doctors and described the frustration of managing patients who had initially been mismanaged by a 'quack':

"When I, when I saw the 22 years female, and suddenly I guess she need ultrasound scan. When I put the probe on pelvic area, I saw 5cm ovarian cyst. But she didn't explain me that I had already the ovarian cyst one year back. She didn't take any proper medication from proper doctor. She went to the quack; the quack give her just antibiotic and flagyl type medicines." (Male, P02)

There was frustration as well at the lack of a legal regulatory framework to control these illegal practices:

"...we start these practices on our own and you know that we try to you know improve the quality and also there are a lot of quacks practising in the primary care setting. But the more than legal doctors, you know, illegal doctors are there, so they do nasty things, and you know, so we you feel very upset about that as well. There are no legal system to you know, control that as well in Sri Lanka." (Male, SL01)

Finally, with regard to systems and regulation participants discussed medicolegal systems. In Pakistan, for example, there is a lack of medicolegal doctors and general practitioners are expected to complete postmortems and testify about such cases in court. These court appearances are experienced as additional stress:

"Hmm no not such stresses ma'am but one a recent stress is that we also have to face the medicolegal aspect of our practice. For example, uh actually there are no medicolegal doctors here in Pakistan, so the doctors, the general practitioners they also face the medicolegal cases like uh anyone who is hurt, even, even the post-mortems, the post-mortems we perform here, so uh that is, then we have to go to

the courts to testify to the court about the post-mortem, about the medicolegal cases ma'am, that is an additional stress." (Male, P04)

One male participant from Pakistan described the stress of a court withholding his salary because he was due to testify in three different courts but due to a misunderstanding failed to appear in one of the courts. Eventually, the misunderstanding was resolved and his salary re-instated but only after he had experienced significant additional stress.

In response to some of these system wide deficiencies, several of the participants spoke of a desire to make changes and positively influence the wider health system, including improving health education:

"Therefore, I want to change the whole system. This is the very stressful [...] for me, that I want to change the medical field, and I want to give health education." (Male, P02)

Clearly, FPs are facing significant demands from the systems in which they work. Again, a lack of resources, along with poor communication and support, are mentioned as possible drivers of some of these system wide failures, underlining the inter-dependence of these associated factors. However, more positively, despite the stresses experienced several of these physicians appear willing to continue fighting for change and system improvements.

7.4.6 Socioeconomic and political factors

This sub-theme looks specifically at the wider socioeconomic and political factors that are experienced as demands by participants, including discussions around crime; economic instability, unemployment and poverty; and political policies and interference. A lack of security, or law and order, was mentioned as a challenging political and socioeconomic factor

by participants from Pakistan and South Africa. Violent crime, particularly prevalent in certain areas, led to one participant moving to a job in a different area following a violent mugging and a hijacking attempt, and led to another participant choosing to live a greater distance from her workplace:

“...it's, it's quite a dangerous area to live in, most of us sort of live quite far, I would say between 20 and 50 kilometres from, from work...I think as a woman driving alone, it is a little bit more scary and um... Yah, you do, you are obviously, a bit more cautious, gripping the steering wheel, making sure your phone is, and your wallet is hidden away somewhere. Um, yah, so definitely impacts you know how you feel when you get to work, when you get home in the evenings with the late afternoons, yah.” (Female, SA07)

Some of this instability was exacerbated by the COVID-19 pandemic as people lost their jobs leading to increased unemployment levels and poverty. Unemployment and poverty then had a knock-on effect on the affordability of medical insurance for individuals and the increasing numbers of patients unable to pay for treatment led to physician stress:

“...we now have other resource shortages, and they mainly come from the client's perspective. So, since the covid um situation or scenario, a lot of people lost their jobs, they went on to half time, they cut their um contributions to medical aid, etc, um so a lot of the, the resource shortage as we now finding on the client side, and not so much on the actual facilities side...” (Female, SA02)

In addition, fewer patients able to pay for their treatment, means lower incomes for physicians, and resulting economic stress with one physician describing how she has had to cut back:

“I’ve had to change things like my own income has affected what I can afford in terms of my vehicle. I had to sell my vehicle during covid, I’m now ‘uber-ing’, um so my own transport uh capacity is reduced. Um, the amount of money I have to spend on my own children and family is reduced, I’m having to help other families and um, resources are being diverted elsewhere, so, um, my own household income and the capacity that I have is reduced.” (Female, SA02)

While several participants mentioned the personal impact of the post-pandemic economic downturn, one country in particular, Sri Lanka, experienced an economic crisis, defaulting on its national debt in May of 2022. This was discussed by Sri Lankan participants as a significantly stressful time:

“Due to, you know, I know, waiting in queues, waiting for fuel. So that was a bit of a disastrous time for us to all of us. And patients also, you know the patient load was also reduced because of the, you know, the economic crisis. They just tried home care or some self-care. So that also affected the, the income of doctors as well as the other people.” (Male, SL01)

In addition to the more general impact of the economic climate on patient resources and physician incomes, several participants spoke more specifically about patient poverty, how it affected them and how they responded, recounting specific patient-doctor interactions. Patient poverty becomes a stressor for physicians when they are unable to provide appropriate care for a patient because the patient is unable to raise the money required to pay for their investigations or treatment. In some cases, when faced with extreme poverty and need, physicians will waive their fee:

“Today, when a patient came to me, Madam. She was 60-year-old. She came to me with her um grandson. She had one son. He died in a coal mine work. She said to me,

I never afford your fee. Then I call my assistant and said please return her fee and I will check this patient free of cost. That's like a patient came to me. This is a very stressful point for me.” (Male, P02)

Or cover the cost out of their own pocket:

“Even this is maybe quoted or not quoted but even sometimes I pay from my pocket to some poor patient that they tell me that I don't have money to buy the medicine. My government setup, not in my private. So just some, ah, like in Pakistani few dollars, I pay them that at least they should have some support...” (Male, P03)

Political factors were also described as stressors. These factors included political interference, political policies such as the plan to introduce a National Health Insurance system (South Africa), and a lack of government support for health workers and the health system. One participant from Zambia suggested that a separation of work from politics was necessary:

“...of course, you can't because politicians make policies that apparently also affect health, but in our scenarios of late, it's been too much of politics, if you like, where people are really, you have to be near a politician for you to get what you want or the work that you want, need to do or to get certain things that are supposed to come by virtue of you being the district health director. You'll find you, very hard to get them. So, if those two can be, find a way of separating those two, that would be the best I can ever...” (Male, Za05)

In summary, the main factors mentioned as stressors in this sub-theme were violent crime; unemployment; poverty and the wider economic climate; political policies and political interference; along with a lack of government support for the health system. Although these political and socioeconomic factors are not directly job-related, nonetheless, they have a

significant impact on physician's working lives and thus are an important source of stress for FPs in some LMICs.

7.5 Resources

Within the JD-R model of burnout, resources constitute those factors that either balance or reduce the demands of the job or that support career development and/or the achievement of particular goals (Bakker and Demerouti, 2007). Similar to the theme of demands, the theme of resources was organised into six sub-themes. These sub-themes are as follows: essential supplies, services, and staffing; community; career development and training opportunities; motivation and values; reward; and finally work-life balance. As before, these will be discussed in more detail in the following sub-sections.

7.5.1 Essential supplies, services, and staffing

To successfully diagnose and manage patients, FPs require the availability of essential resources such as appropriate medical equipment; consumables such as medication, dressings, etc.; reliable utilities (e.g., water and electricity); specialist services for both investigation and referral; and adequate staffing including nurses and auxiliary staff. The lack of these resources is often perceived as a stressor or extra work demand as physicians have to 'make do' without adequate diagnostic facilities, alter their prescribing habits to account for medication shortages, or work extra hours or under extra pressure to cope with the demands of understaffing. Thus, although I have chosen to place this sub-theme within the theme of resources, most participants spoke of the lack of these basic resources and perceived the lack as a demand.

7.5.1.1 Medical supplies and equipment

There was variability in the responses around availability of basic supplies with a few of those interviewed stating that supplies of medications and equipment were adequate. This was especially so for those working in the private sector, and in larger urban centers with tertiary, well equipped hospitals. However, most of those interviewed had, at some time, experienced a lack of availability of basic medical equipment or consumable medical supplies such as medications:

“We do have shortages of drugs and medical supplies and consumables such as IV fluids, urinary catheters, rarely needles and syringes, bedside glucose testing sticks, laboratory reagents.” (Male, Za08)

Additionally, where medical equipment was available it sometimes was not functioning, or available medical supplies had expired:

“We, you know, the, the very basic resources like um the very, very basic things that you need for example, in an emergency centre, like an ECG or a functioning defibrillator, um, you know, wall oxygen, um. Oftentimes that is also not working properly... So, um, we might deal with what we have and um sometimes you know we do, we do struggle because we’re sitting with expired products but rather have an expired product than nothing.” (Female, SA07)

At times, the lack of basic supplies had significant consequences for patient care, with the worst-case scenario being patient deaths:

“I can’t express in these last 2 years how difficult the patients dying because of non-availability of oxygen, non-availability of medicine...” (Male P01)

This lack of basic medical equipment and supplies has a significant impact on physicians especially when clinical care makes up a majority of their workload and yet they lack the resources to adequately diagnose and manage their patients. Some spoke of the need to just ‘make do’ with what they had, others of ceasing to question, despite the frustrations, and just carrying on doing whatever they could. The impact on the physician of not having the resources necessary to adequately care for their patient was described by this male participant from Zambia:

“So, you're having these patients who are very sick, who need your help, but you don't have the tools or the materials to use to help them. That's very frustrating and stressful. That's the government sector.” (Male, Za07)

Related to the availability of basic medical equipment and supplies is the supply of basic utilities such as electricity and water. Adequate supplies of electricity are essential for operating medical equipment, as well as computer and communication systems; and adequate clean water supplies are crucial for basic hygiene and infection control. The lack of a reliable electricity supply was discussed by almost all the participants from South Africa where planned power outages (loadshedding) are common, as well as being highlighted as an occasional issue by participants from Pakistan and Zambia. Participants from Sri Lanka also spoke of problems with their electricity supply during their economic crisis in 2022:

“...there was a bit of a problem last few years. We had economic crisis, so then there was this problem with electricity, and uh you know, I had to have back up. You know, I don't have a generator, but I have backup plans which, you know, uh you know, uh, give backup light when the power goes off. So sometimes, you know, 3-4 hours I had to have some sort of backup power supply. So that was a bit of an issue. And yeah, it

was difficult then and uh, fans are not working, air conditioning is not working, so the, the clinic staff and patients feel uncomfortable.” (Male, SL01)

The lack of reliable electricity supply not only impacts on staff and patient comfort, as evidenced in the previous quote, but it also affects electronic communications; water supplies where pumps and filtration systems are dependent on electricity; and safety for those working in private practice in the evenings where the lighting levels may be reduced during loadshedding. In addition, it may have a direct impact on patient care:

“...we have a generator here at our facility that just stopped functioning, and we were without electricity for a whole day and a half. And um that meant that we had to defer um most of our patients. It meant that our MOU, had to close and our ladies coming in in labour had to be deferred to the next facility that actually had electricity available.” (Female, SA07)

Many facilities in South Africa have their own generators as back-up but these are not always reliable, or they may be isolated to certain circuits:

“...sometimes the generator supply is isolated to certain circuits, so you might lose like half of your lighting and then suddenly you're trying to do a procedure, the lights go out and you're like OK, what now?” (Male, SA10)

While most of those working in government facilities reported access to generators, the financial cost of acquiring and running generators for those in private practice was discussed as an additional burden. However, most participants from South Africa felt that they had adapted to the frequent loadshedding and that its impact was mitigated by the use of back-up generators.

The availability of clean water was also discussed. One participant from Pakistan spoke about a recent drought and water being supplied by water tankers (Male, P04). Others spoke of the

impact of a lack of clean water on their ability to complete procedures, on infection control, and on patient and staff dignity stating that they found water shortages more difficult to deal with than electricity shortages (Male, SA10). While some worked at facilities that had their own bore holes, they still relied on the electricity supply for pumping water, and this also led to occasional water shortages.

7.5.1.2 Services

Discussed alongside shortages of basic medical equipment and supplies was the shortage of specialist services, including a shortage of ambulances, and/or difficulties accessing specialist secondary care or laboratory services. Again, those in private practice, or situated close to larger urban centers, had less difficulty accessing these specialist services, but for many these services were inadequate and this was a source of stress. In some rural settings, for example rural settings in Malaysia, while there was good access to specialist investigations such as certain specialist blood tests, these tests had to be sent to larger urban centres for analysis and this could take months:

“Like if you're working out for an auto immune disease, those, those kind of results, investigation might be the hospitals like they might send to the capital instead, so that will take at least sometimes a month or so to come back because the transport there and back and then yeah. So, a month or so, sometimes they might send it to Kuala Lumpur instead because sometimes here we don't have the results. So, they have to fly the, the results the, the investigation to the peninsula and then waiting for it to come back. Sometimes that will take about 3 months, six months because they, just to get the result. So, this this is one of those limitations that we face now.”

(Female, M02)

For some the difficulties were more around accessing specialist services via inadequate referral systems, or a lack of available beds in referral centres, for others it was a lack of specialist services altogether. Several participants described a lack of local specialists for certain specialities such as mental health specialists, neurologists, or ophthalmologists. Others described long waiting lists for specialist investigations such as ultrasound or CT scans:

“...just as an example, um if I want to book an ultrasound scan for a patient now, now at this time in October 2022, or a CT that’s not urgent, they, we are actually told that there aren't any more dates for the year, we need to phone in November to get dates for next year.” (Female, SA07)

In some settings where there is a lack of specialists, generalist doctors are left to manage specialist conditions that they are perhaps ill-equipped to manage, resulting in stress:

“...we have so few specialists so, you are moved from your general ward to, to deal with these really specialised conditions. And the more you really stress your brain to think like a specialist when you're a General Practitioner that's also stressful, you know?” (Female, Za03)

In other, more rural areas where there is a lack of local specialist services, participants described using the telephone or videoconferencing technology to access specialist advice:

“...because we meet a lot of patients, we, we, we meet, we meet a lot of patients who might need mental health services and we, we are quite under resourced in that regard... So, so we have to do our best to manage them and sometimes do telephone consults with psychiatrists and uh clinical psychologists online.” (Male, Za07)

7.5.1.3 Staffing

Related to the availability of specialists and specialist services is the more general issue of staffing and this was mentioned by almost every participant. Participants spoke about too many patients and too few doctors and discussed the pressure to compensate for the lack of staff by working longer hours, foregoing breaks, or rushing patient consultations. While patient to doctor ratios are frequently high, one participant pointed out that the ratio was even worse on out of hours shifts where it might double from 50:1 to 100:1 (Female, Za02). For others, shortages of specialist FPs resulted in isolation as they were the only FP in their geographical area. Several participants spoke of shortages of specialist FPs in terms of difficulties filling vacancies especially in rural areas:

“So, we have basically 3 posts vacant, as well as a family physician post vacant up until now. So, four posts have been vacant basically for the year... So, when we’re struggling to fill it because it’s more a rural area, not all, everyone wants to work in rural, so, it’s not always easy to just fill posts...” (Female, SA03)

Participants also spoke of shortages of nursing and auxiliary staff as well as shortages of allied health professionals such as physiotherapists, speech therapists, and occupational therapists, and how these shortages impacted optimal patient management:

“...basically, we have a full allied health team, but one of each, and that’s again, for the hospital, um, as well as the clinics, so it’s one physio, one OT, one speech therapist, one, we have a psychologist, um yah and one dietician. So, if they’re on sick leave or leave or maternity leave, we have no one. Um, which is a struggle if we want to manage the patient optimally.” (Female, SA03)

Furthermore, this lack of human resources impacts on the availability of other resources such as professional development activities as physicians cannot be released to attend training events. Staff shortages also lead to patient complaints and conflict, and may impact on available support and the achievement of work-life balance:

“...what is quite stressful I think a little bit less so this year, but especially last year was um, you know, finding work life balance. I think we were severely short staffed, and the workload didn't decrease, I mean it just actually increased and with me and another registrar having to pick up the kind of the roles of this missing family physicians.” (Male, SA13)

7.5.1.4 Funding for essential resources

Adequate funding is essential for the provision of adequate supplies, services, and staffing and funding issues were raised by several participants. Notably, participants from Malaysia spoke about primary care being funded jointly with public health in Malaysia, leading to disparities in funding between the primary care sector and the secondary care sector. One participant suggested that most of the budget for primary care and public health was spent on public health activities leaving primary care underfunded:

“...public health, especially during Covid, all the money went pumping to pandemic and outbreaks and everything. And then of course public health we got those awareness, create awareness healthy living. So, that money went into the promotion and everything. So, there's just how they cut off a bit of money to the primary care. So, I, I'm assuming that is the reason why there's no money to pay us for the on calls (laughs).” (Female, M03)

Participants from South Africa also spoke of disparities in funding between primary care and secondary care and one suggested that the shortage of FPs was partly due to a lack of funding to pay for them:

“...then you would get also some of the um admin or the management staff that feels um you know, why do we have to spend so much money on a family physician, where you can just put a, um, an intern there for, for much cheaper...” (Female, SA08)

One participant from Zambia expressed the opinion that a lack of central funding was at the heart of human resource shortages and without sufficient funds nothing could change:

“Even if you're complaining, nothing will change because the shortage of manpower and the government are saying if they don't have money to employ more doctors. OK, so there's nothing can change.” (Male, Za04)

In summary, adequate medical supplies, services, and staffing were discussed as a vital resource for FPs in each country and the lack of these essential resources had consequences for the delivery of high-quality patient care and for morale, with one participant describing it as a “...daily moral injury...” (Female, SA03). Participants found the lack of these resources and the need to ‘make do’; the inability to provide high quality patient care in the face of shortages; and the increase in their own workloads to mitigate understaffing; extremely stressful. In the face of limited funding, some had little hope that shortages, especially in human resources, would improve.

7.5.2 Community

Community support, both at work and from wider personal support networks was widely acknowledged as an important resource. The work community: managers; colleagues; and

peers; is an important source of support for many physicians, mitigating the demands of the job. Many spoke of very supportive work environments and the importance of being able to 'debrief' or discuss work stress with colleagues:

"...and, and if they say something's wrong, we just uh, let it out, like uh, you tell, I don't feel so great uh yeah, you know, we, we, we talk about it. Or let's say we had a rough day, or we're fed up with a certain type of patient, we, we, we let it out at least with my colleagues in my district." (Female, M01)

Another important source of colleague support discussed by participants was wider professional networks such as membership of WhatsApp groups, Balint groups, attendance at conferences, or professional organisations such as the Medical Women's Association of Zambia. These groups, and others like them, were all described as useful for both networking and support. One participant in the role of District Health Director spoke of the importance to him of support from other District Health Directors, and his subsequent desire to mentor others:

"I've been one of the senior district health directors and I've gone through these issues, I'm able to mentor others as well. I'm able to speak to them and try to somehow guide them whenever they feel stressed, and they feel they are not going, things are not going the right way, or they are, they are stressed and so on." (Male, Za05)

However, some participants, like this family medicine registrar, experienced less support within their work environments:

"I have not really found the family physician at the site to be the resource I had hoped and have not managed to meet regularly with them - scheduled meetings seem to be postponed etc. this is a resource but seems currently unavailable." (Male, SA05)

Several discussed generational differences in terms of support offered, feeling that their senior colleagues sometimes lacked understanding of the pressures junior colleagues faced, or expected them to cope in the same way that they had:

“Also, the attitude of senior colleagues as they believe in juniors suffering as they suffered and believe mental health is not an issue but simply a sign of weakness.”

(Female, Za01)

In addition, while the support that comes from feeling part of a team was acknowledged as an important resource, many FPs work as solo practitioners, especially in private practice, and others find themselves as the sole FP in their area simply because of understaffing. For these practitioners, the problem of colleague support is more acute, and many feel isolated and overwhelmed as a result. One private practitioner from Sri Lanka felt that while he did have colleagues for support, they were often difficult to contact because of busyness, and he lacked wider support within the system:

“But you know, sometimes they are also very busy, you know, when you try to call them, you can't get through to them... So that is a bit of issue... there is no support as such in our setting, you know. You work alone. I am a solo practitioner, so a solo practitioner gets into trouble sometimes, you know with regards to clinical decision making and you get stressed out what to do next time and that sort of thing. So sometimes you know, there are colleagues who help me. But you know there is no big support as actually when it comes to the system.” (Male, SL01)

Personal communities are not only made up of work colleagues. Family and close friends form an important element of community, and many participants spoke of their families being their biggest supporters, and of their support from family and friends as being an invaluable resource. This made coping during the pandemic especially hard as some family

members withdrew and even after travel and contact restrictions were relaxed, maintained their distance out of fear of infection. Other participants spoke of going long periods of time during the pandemic without seeing family members:

“There was a point where I was burned out. I mean, during pandemic, that was hard because I was apart from my family, we had already called it like a lockdown. So, we cannot travel between districts even. So, I couldn't see my mother for about nearly 11, nearly a year, nearly one year. So that was a bit difficult.” (Female, M01)

In an effort to maintain these support networks several participants spoke about using videoconferencing technology to maintain contact and one participant stated that although she rarely talks about her work with her family, it helps “...just to hear them talk” (Female, M01). In addition to the difficulties of maintaining personal support networks during the pandemic, Malaysian participants in particular spoke of the loneliness of mandatory government postings to locations quite distant from home, and the impact of that on their personal support networks:

“So, friends are also all away family also all away. So, when you come to new place to find a friend in a new place is rather be difficult, yeah. ...And knowing that if I need to go back and find them, I need to take two flights (laughs).” (Female, M02)

While workplace support was acknowledged as an essential resource for mitigating the demands of the job, the support of family and friends was also recognised as invaluable.

7.5.3 Career development and training opportunities

Training resources and opportunities for professional development are a vital aid to achieving goals and thus an important resource. Participants were asked during the

interviews about their access to training and professional development opportunities and many replied very positively. During the pandemic, many activities went online including training workshops and educational resources. This was mentioned frequently as a positive consequence of the pandemic, allowing greater access to training at a lower cost:

“...one very good thing this pandemic has brought is like using the internet, the social media so most of the time nowadays we are receiving the training material through social media like WhatsApp, like Facebook, so very, very, good training material nowadays we are receiving...” (Male, P01)

Participants also spoke of the source of their training. In all of the countries the government provided a basic amount of continuing professional development and training resources, but, outside of master’s programmes or Family Medicine diploma programmes, these were often limited to particular areas of interest that aligned with the goals and objectives of the Ministry of Health. Other sources of training and professional development were foreign NGOs or pharmaceutical companies, again, each with their own agenda:

“...most of the training which we receive in [...] it comes because of the support from uh foreign, foreign, like we, we receive the support of a global fund for uh TB control programme, like uh, uh, covid control programme from WHO, like malaria control programme, uh and hepatitis control programme, so and sometimes from our own pharmaceutical companies...” (Male, P01)

Some of those interviewed were affiliated with a local university and had good access to training resources through the university:

“...I’m affiliated with the university so we’re invited to quite a lot of training and there’s a lot of in house um departmental training that, that we can access and we’ve got quite a, we’ve got a reasonable training budget so if the course is relevant to work

we can apply and I'm on the training committee so we, as long as there's funding we usually, um you know we, we do send people on applicable trainings and we also encourage all the medical officers at our facilities to go on training that's uh will either further their careers or is in line with the current um work they're doing, so I think it's, it's fairly good." (Male, SA01)

However, opportunities for others in more rural settings were limited:

"There is some opportunities, so I went to the rural health conference that was paid by the department and they paid for the accommodation, but it's, it's, not a lot. There are more opportunities online um these days um, but it's dictated by the people development um and what they will pay for. So, if it's anything outside of the small amount of courses available, that they make available, um you pay for it yourself and you do it on your own time..." (Female, SA03)

Frequently discussed, as participants spoke about training and development, were the time and cost of training. Many spoke of adequate training opportunities but limited accessibility to training in terms of time. The need to have cover at work in order to attend training was a common barrier:

"...for me, the opportunity for training. Yes, they gave me opportunity. But in terms of the dedicated time to go for training that is a bit of a, I don't know whether to say problem, but it's quite challenging..." (Female, M03)

The cost involved in more formal postgraduate training was also perceived as a barrier but one that some made sacrifices to overcome:

"However, most of the, even my master's in public health, I was paying from my own funds... I had to pay for it. So, sometimes government yes, it comes up with programmes where you'll be sponsored to go and do something outside Zambia or

within Zambia, but those are rare and few and usually a few people will be there and not everyone will be incorporated yes.” (Male, Za05)

Also highlighted were the difficulties of getting internationally recognised qualifications and the resulting feeling of marginalisation:

“Only thing I guess is a bit sad is we can’t really get international qualifications, stuck where we are down South... it’s so difficult for us to you know get the qualification to be recognised, it’s almost unaffordable... although we feel a bit marginalised living in, living in Africa, you know, deepest, darkest Africa, you know, like that’s, there’s a perception that um, you know it’s inferior, you know, training inferior, quality of care, you know, all that kind of thing...” (Female, SA02)

In summary, the explosion of online resources during and after the pandemic was mentioned by almost everyone positively, as having increased their access to training resources. Most were happy with the training resources available to them; however, time and cost were mentioned frequently as substantial barriers to accessing training.

7.5.4 Motivation and values

The ideals that motivate individuals to choose medicine as a profession, and their values, especially when those values are shared by their organisation, are an important resource and motivator for physicians when job demands are high. Many participants spoke about being motivated by altruism, a desire to help people and relieve suffering:

“...from very early time, I wish to help people. I wish to help the poor community, I wish to, uh, uh, overcome their, the issue of health to help them in, in, so these were some points that pushed me to become a doctor.” (Male, P03)

Others had been motivated to pursue a medical degree because there was cultural or family pressure on them to choose medicine as a profession, because they had an academic interest in medical sciences, or because they had a medical role model. Some spoke about the role their faith had in their decision to choose a medical career:

“Over the years I have understood my own reasons better - I like helping people and walking alongside them as they journey towards health. My faith also plays a role in my decisions and the role I see myself fulfilling as I work.” (Male, SA05)

In addition, several spoke specifically about what motivated them to choose family medicine as a specialty. For some it was the prospect of a better work-life balance but for most it was the continuity of care, and the long-term relationships with patients that drew them to the speciality:

“I preferred something that was more in the community rather than being in a hospital where especially a tertiary hospital. You're just stuck there. You know, even if you see, sometimes you just never see that same patient again... So at least in the community, you know, you follow up that same patient. That's your patient. So, you feel more satisfied, you know?” (Female, M01)

Most had no regrets about choosing a medical career. For those who had regrets most of the regret was over working conditions rather than being a physician. While they did not have regrets about being a doctor, they regretted the impact that poor working conditions had on them and their families:

“Well, the thing is now when I see my other, other friends, other colleagues who have free time, who enjoy their life to the full, I feel a little bit upset. You know, you don't have free time, and you have no free family time, and you know those, and you don't

have free time to travel as well, sometimes restricted. So those are few things that I regret.” (Male, SL01)

The values that a physician holds may also be powerful motivators. When asked about the values that were important to them many participants spoke about the importance of health equity, fairness, justice, high quality care, and hard work. Other values discussed were harmony, integrity, empathy, compassion, and the need to treat patients with respect and dignity. Some worked within organisations that shared their values:

“I really agree with the values of my employer. I have even put it on the wall in the office. Caring, competence, respect, responsiveness, innovation, integrity, accountability. We talk about them quite often in meetings and I have a high regard for that. I believe in teamwork, being humble and open to learn in every situation and I can see that this is also what most of my colleagues strive for.” (Male, SA09)

However, others spoke about the impact of working in an organisation, or with colleagues, whose values did not align with their own. Some spoke of conflict with colleagues arising from dissonant work values, others about the resulting loneliness and frustration, as well as the impact on morale:

“The lack of fairness directly impacts me in a negative way, it’s demoralizing, it frustrates my efforts. It makes me just want to do the bare minimum instead of striving for excellence.” (Female, Za01)

For one participant, this dissonance between their own values and the values of the system they worked within had resulted in a move from a public sector role into the private sector:

“It’s one of the reasons I’m, I am actually in private practice is because I battled to align my values with the values that I, when I was working in the state setting. I worked there for a long time, but I struggled, um, especially towards the end, um, the

number of patients you had to see per session and the amount of your own time and um skill that you could actually invest per patient was just not in keeping with my value system.” (Female, SA02)

Clearly, the underlying motivation for choosing the medical profession as well as the values a physician holds are powerful ongoing motivators. However, it is important that the values of a physician align with the values of the system they work within, and dissonant work values can be highly demotivating.

7.5.5 Reward

The concept of reward as a resource encompasses both financial, as well as social rewards such as professional recognition, and status. These are important resources mitigating the impact of job demands. Several participants spoke about the importance of appropriate remuneration for the intensity of their workload, and many of those who answered the open question on the questionnaire about stressors, as well as interviewees, identified inadequate salary as a stressor. Some of the interviewees mentioned that hospital specialists received more adequate remuneration for their specialist work than specialist FPs, implying that FPs were not really perceived as specialists, and thus were not remunerated as such. Several spoke about the inadequacy of the government salary and the need to have other additional sources of income, such as income from private work:

“...the salary I get from the government is not enough for me to, you know do the other things like, say, looking after the children and they are dependent so, so I had to do a lot of work I think till you know at one stage I'd like to stop and just uh concentrate on the academic job.” (Male, SL01)

Alongside salary, job satisfaction and security, recognition and respect, professional pride, and spiritual blessings were all perceived as rewards. Seeing progress being made in their health systems, for example, in terms of falling maternal mortality rates and improving access to resources was also discussed as very rewarding. Some also discussed the richness of patient and colleague relationships as a reward of the job. In addition, for those motivated by altruism, seeing patients recover and the knowledge that they were helping people was very rewarding:

“...I think um what I find rewarding is, and it does happen a lot, even looking at our resource limited settings is having so many people come in unwell and then you know, come out of the hospital...” (Female, Za03)

However, several mentioned that family medicine was not really understood as a speciality, and this lack of recognition and respect from both patients as well as specialist colleagues, was a source of dissatisfaction:

“We are like, not really considered a specialised kind of feel and you feels that every time and it's like when people ask you what do you specialise I say I'm, I'm doing family medicine. I have to know everything... Yeah, and we, we coordinate, uh we will see the child, the person as a holistic kind of approach... But people don't get it. People prefer oh, Cardiology, a cardiologist, you know that kind of thing. So that's the only thing like some, there are moments that, that times I feel that maybe I should have gone into another field in medicine.” (Female, M03)

In summary, adequate remuneration for heavy workloads is an important resource but there are also many other factors that operate as rewards, including recognition and respect, job satisfaction, and relationships with colleagues and patients.

7.5.6 Work-life balance

The final sub-theme within the theme of resources is that of work-life balance. In a profession with complex workloads and long work hours, adequate breaks from work, and a good balance between these heavy workloads, other life responsibilities, and personal time, is a vital resource. Some participants spoke of the difficulty of finding time to pursue hobbies and the struggle to achieve work-life balance when they were severely understaffed. Others about the tendency for work activities, especially administrative responsibilities, to spill over into personal time. Most of the Zambian participants discussed difficulties taking leave owed with one stating that he had not taken any annual leave for five years and describing his work situation as an 'open prison':

"...So, as the catchment area, and even coming from you know other districts where you know the long queues and you know kind of which was a bit tricky. So, no vacation (laughs). No time for yourself, so you can't even move from there, it was like kind of an open prison like (laughs)... Ah, the whole five years I work under the government, so I didn't have any vacation." (Male, Za04)

Also spoken about mainly by the Zambian participants, but also by participants from Sri Lanka, was the pressure to attend work even when they were unwell (presenteeism), with work responsibilities eclipsing their need for personal rest and recovery:

"At one point while admitted in hospital I was still called on to review a patient as directive from my boss who was aware of my admission to hospital." (Female, Za01)

In contrast, for others the desire for a good work-life balance had influenced their decision to specialise in family medicine rather than in a hospital speciality:

"...the main reason why I persist into family medicine is because of uh I am not, uh, uh my family is not located in the like a big city, we're, we're living in far outskirts. So,

I think had to be coming specially to have a better training rather than becoming a hospital specialist, so I think I'm better off located here to have a better work life balance I'd say..." (Female, M04)

While a good work-life balance is clearly an important resource it was equally clear that for most of those interviewed this resource was lacking and in many work environments it was extremely difficult to get adequate breaks from work, or to achieve a healthy balance between work and personal or family time.

7.6 Living with workplace stress and burnout

This theme is divided into the following three sub-themes: consequences of workplace stress; understanding and experience of burnout; and stigma of burnout. The first explores the consequences of workplace stress more generally, the second explores participants understanding of what the term 'burnout' means as well as their own personal experiences of burnout in terms of the situations that led to burnout, the symptoms experienced, and in some cases the wider consequences of burnout. The third sub-theme explores the concept of burnout-related stigma.

7.6.1 Consequences of workplace stress

Participants were asked during the interviews about the frequency of experienced stress as well as the impact of stress on their lives and communities. This was asked in the context of the everyday stresses that they experienced rather than in the context of the more intense burnout experience, however, there was substantial overlap between participant descriptions of the consequences of more general workplace stress and their descriptions of

the consequences of burnout. Thus, these more general consequences of workplace stress, form a sub-theme within the broader 'living with workplace stress and burnout' theme. Most participants acknowledged that they experienced frequent work-related stress, from daily stress to several times a week. A few felt that they experienced stress at work less often as a result of moving to a new, less stressful position.

Participants spoke about the impact of this frequent, everyday stress largely in terms of the impact on their health and quality of life. Many of the physical and psychological symptoms that they associated with everyday stresses were repeated in their descriptions of burnout. Some felt that the development of chronic conditions such as HBP were directly associated with the persistent stresses of work, and even those who did not feel 'burned out' spoke about sleep disturbances, tension headaches, migraines, heartburn, anxiety, and chronic fatigue when they were under stress at work. Frequent absence due to illness was also noted in the context of everyday stresses. One participant wondered whether it was everyday stress that was causing her to become unwell more frequently, and stated that she had noted an increase in absenteeism in colleagues who were under stress:

"... I tend to get sick more often, like now. Um, so yah, so I think it, and, and I've also seen it with other colleagues here that they um if, if it's a very stressful or very busy time at work, it also coincides with more absenteeism..." (Female, SA07)

Also discussed as a response to persistently stressful working conditions was an increase in self-medicating and alcohol consumption:

"Indeed, it's exhausting. You know, it's very, and that's another thing you find doctors with you, you, you should actually even doctors drink like no man's business. There's a lot of alcohol abuse and not only alcohol you find, there's also medicine abuse. And

I think most of the times is doctors trying to stand doctors trying to sleep.” (Female, Za03)

Some participants felt that because of heavy workloads and long hours they did not have time to pursue healthy lifestyles by exercising or eating regularly and healthily, acknowledging that this might have consequences for their physical and mental health. One participant from Zambia had noted that his blood sugars were more difficult to control during times of stress and another shared an experience illustrating the impact of heavy workloads and time pressure on his personal health:

“Because I remember even when one night because I didn't eat the whole day, there was no time to go for lunch, breakfast. Then I ended up, you know, having an acute gastritis and yeah it was a really, really a bad experience for me... All that just because of the work we are doing. And at certain point we, we forget like it's also important also to take care of ourselves.” (Male, Za04)

While the consequences of everyday stress for the individual, especially in terms of health, were broadly similar to those of burnout, they were described differently in terms of severity and intensity. However, undoubtably, there is overlap between this section and the subsequent descriptions of burnout experiences.

Stress and heavy workloads were also acknowledged as having a negative impact on personal relationships with family and friends. The irritability and withdrawal described as part of both everyday stress and burnout has implications for those closest to an individual and many participants spoke of the impact of stress on their marriages and their families:

“...so, for me the fact that I did not realise that my marriage was also suffering and, and you know I, I got so in, in, I was so engrossed in trying to make sure that I don't miss a day at work that I just didn't notice that something was wrong at home, you

know. And by the time I was realising it uh we were dragging ourselves to court. A year later we were divorced.” (Female, Za03)

Most participants spoke about not having enough time to spend with family and friends, or to attend culturally important community events such as weddings. This has an impact on the development of good interpersonal relationships, especially with their children:

“Second thing when I go home probably, I, I have no time to speak to my daughter and son so that is a little bit of an issue, they are, they are fast asleep, and you know, you know, sometimes when I get late, I don't speak to anyone, I just have something and go to bed. So, that is a bit of issue.” (Male, SL01)

One participant from Zambia spoke of the lack of time or energy for anything outside of work in stark terms:

“...it has taken away my time for family, taken away my time for friends, taken away my time for any social activities that I would want to do.” (Male, Za05)

Furthermore, physicians clearly associated work-related stress with their work performance, voicing concerns that everyday stress, had a negative impact on the care physicians provided:

“...the impact is, you know, sometimes you know, the care that, the quality of care that you give to the patient may be, you know, reduced because you know you try to get rid of the patient quickly when you are tired, and you want the patient to go off from the, the, the consultation room and you want to see those rest of the patients quickly and finish the session. So that is one thing that I think that I do sometimes when I get exhausted.” (Male, SL01)

Many also described the impact of stressful working conditions on their future intentions. Thoughts of moving to a different job role with better working conditions were commonly

described, as was the desire to move abroad in pursuit of a less stressful working environment:

“...most of my class fellows, my 20, 30% medical college, basic medical college class fellows are working in your UK. My female uh class fellow I can contact her in Egypt and works [...] every month there, my class fellows are there, and they have a very prosperous life, and I feel unhappy for my life, but I feel happy for them that they’re enjoying they’re uh, uh, getting high salary, they uh, have a good quality of life, enjoying it, but uh I do wish to go abroad...” (Male, P01)

Notably, most participants stated that even if they pursued a different, less stressful role they would stay within the medical profession. Several had already moved to different, less stressful positions in response to high stress levels, or had reduced their work hours. However, one participant from Malaysia felt that while she was currently coping with the stress of her role, there might come a time in the future where she could no longer cope and might quit medicine altogether:

“That’s why I didn’t, in the end, I didn’t quit yet. I, I don’t know whether there will be a breaking point when I just cannot take it, and I’ll just quit. I don’t know...” (Female, M03)

Several participants described high turnover rates within their departments, correlating this with high levels of work stress. Work stress was also described as a driver of high levels of internal migration in South Africa:

“So, we’re seeing a lot of people, what we call ‘semigrating’, moving in from the rest of the country, and emigrating, moving out to elsewhere, um and so that’s quite dynamic, in terms of stressful.” (Female, SA02)

In summary, consequences of high levels of work stress include ill-health which leads to increased absenteeism; negative consequences for physician relationships; reductions in physician performance and quality of care; and the potential for high turnover rates as physicians seek less stressful work environments. Migration was also discussed as a potential consequence for the wider health system.

7.6.2 Understanding and experience of burnout

Burnout was widely understood as a term referring to excessive, prolonged, work-related stress, with one individual describing it as work-related depression. Most of the descriptions of burnout focused on exhaustion as the core component of burnout but one participant was clearly familiar with Maslach's definition of burnout, describing it in terms of the three dimensions of exhaustion, depersonalisation, and reduced personal accomplishment. Another participant described it as resulting "...from stress and overwork without appropriate recognition or assistance" (Male, SA05). One participant had attended a workshop on burnout and while at the start of the workshop he acknowledged that he was stressed but did not believe himself to be burned out, by the end of the workshop he recognised his stress as burnout:

"...at the beginning I said to myself, I, I don't have burnout, I have other forms of stress, um, and then during this eight week, it was like a weekly um online contact over 8 weeks, during these eight weeks I had my, it was bizarre, I had my first episode um of florid depersonalization... and at the end of the course, uh although I had more uh tools with which to deal, with which to approach stress, I actually identified more with burnout um over time." (Male, SA10)

Several described experiences of burnout during the pandemic but felt that now they were mostly recovered:

“...I think second and third wave that was it, we were, I think we were all burnt out... We didn’t know when covid was going to go, we thought this was just going to maybe stay and there was going to be no hope... personally I feel at the moment, that maybe in the last few months, um, the personal burnout has, um has lifted as well.” (Female, SA02)

Others described the causes of their burnout experience, associating burnout with specific work situations where workloads were overwhelming and there was a lack of associated support or resources to deal with the demands. In some situations, these difficult work situations were combined with personal adverse life events such as divorce, family illness, or bereavement and it was this combination that they felt had triggered their burnout:

“...at my previous work I think I experienced burnout and I, I made a change to another hospital, but there were some, other than overtime I had some person, uh personal issues, I had a father with health issues that was quite stressful, a lot of uncertainty and I struggled to, to sleep due to that, and I struggled to cope with doing night shifts and my stress at home and, and I, I couldn’t cope so I needed a change, and that was my burnout there...” (Male, SA01)

As with discussions around the consequences of everyday workplace stress, personal experiences of burnout were described largely in terms of the consequences to both physical and mental health. Physical symptoms specifically related to descriptions of burnout included: exhaustion; lethargy; palpitations; headaches; muscle aches and pains; changes in appetite and weight; sleep disturbances; and chronic conditions such as irritable bowel syndrome (IBS). While some participants noted that increases in illness and work absences

were more generally associated with increases in everyday work stress, one South African participant observed that frequent illness in colleagues coincided with highly stressful times when he felt his colleagues were likely to be burned out:

“...during the time that the team worked really hard um people became ill quite frequently and I realised that was an effect of um you know the circumstances that we were under and that they, you know in retrospect I realised that they were also struggling with burnout in their kind of, in their own way, and you know, that manifested physically, or with real illness...” (Male, SA13)

In addition, a wide range of psychological symptoms were described as consequences of burnout. Participants described irritability and anger; anhedonia; loss of interest in hobbies; low mood; lack of concentration; withdrawal; anxiety and panic; feelings of being overwhelmed and of hopelessness; neglecting self-care; and feelings of fatalism. One participant from South Africa described her burnout experience during the pandemic:

“So, you know combined insomnia, like I said to you, not eating, feeling that there was no hope, you know, in the future that we’d never get a grip on what we were at, we’d never see the end of the patients who were just in respiratory failure... it just felt, um, I think as though you were literally being swallowed or enveloped, um by this dark, black, heavy, thick cloud...” (Female, SA02)

Another participant from Zambia described her more recent burnout experience:

“I have experienced burnout, I am always tired, dragging myself to get out of bed, highly unmotivated, I no longer care about things I used to care about. I no longer attend to my hobbies. Am more isolated, rarely interact with others...” (Female, Za01)

Furthermore, strategies to cope with burnout, such as reducing workloads, sometimes resulted in feelings of guilt:

“I’m in my 40’s and I’ve worked many years, so I guess I, I need a break. I didn’t take long breaks or long sabbaticals so I shouldn’t feel guilty. I don’t know why I feel guilty I just, probably partly my upbringing, have to work, my father was a shopkeeper, and we worked very hard on weekends and so, I shouldn’t feel guilty for taking some, working less hours...” (Female, SA06)

Participants described the impact of burnout on their work performance in a similar way to descriptions relating to the consequences of everyday stress, but with more intensity and detail, stating that the quality of their work and their enjoyment of work was reduced during burnout. Furthermore, they felt demotivated, and experienced compassion fatigue, decreased productivity, difficulty making decisions, and increased conflict with colleagues due to irritability. Some even stated that they had felt like quitting their jobs. Another participant from South Africa described her experience of burnout and the impact it had on her work:

“Well, I literally got to the point where I could not cope mentally, I couldn't make decisions, um I couldn't sleep at night. I couldn't, I took some time off my studies because obviously I couldn't work on my studies. Um, and um, I mean, I screamed and shouted at a colleague. I've never even screamed and shouted at a patient, um screamed and shouted at colleagues, threw the phone down in people's ears because you just, you can't think straight anymore at that, at that particular time in point. And um doubted myself, couldn't make the simplest decisions, like what should I write up? What should I do?” (Female, SA12)

One participant recounted that it was watching a colleague’s battle with burnout and the consequences for her colleague that prompted her to seek help for her own burnout perhaps earlier than she might have otherwise done:

“...it definitely took some time. I think uh what helped me as well, I had another colleague, uh that also got burned out, um another family physician, but she did not get help in time enough and her burnout was so bad that she couldn't even go back to work, not even simple stuff like, like teaching the students, like literally, that's how bad. And like when I realized that was with, what was happening I immediately got help, um I immediately was booked off for a month...” (Female, SA12)

Most participants described burnout in terms of the consequences of burnout for their physical and mental health and the impact of burnout on their work. Several felt that while they had experienced burnout in the past they were now recovered and doing well, and while some spoke about burnout making them feel like quitting their jobs, a few had indeed moved to a different job as a way of managing their burnout. Others had sought professional help in managing their burnout, some undergoing psychological therapies or counselling, others taking medication for anxiety and/or depression.

7.6.3 Stigma of burnout

The issue of stigma around acknowledging both work-related stress and burnout emerged early on in the interviews. While some Malaysian participants described a more open work culture among FPs where, on the whole, there was willingness to talk about work stress and a supportive work environment, one felt that there was indeed a stigma attached to acknowledging burnout and a reluctance, especially from senior colleagues, to provide support:

“...I feel that there is a stigma because whenever when we were I mean among, we have our own WhatsApp group. So, the seniors I mean maybe because they are I don't know maybe they are more resilient, they will say it's OK, things will get better

and I feel that because I'm not considered junior, but I'm not considered that senior, so I feel that why can't you just acknowledge that we are burnt out? We need we're asking for help.” (Female, M03)

Another Malaysian participant, when asked about whether she had ever felt burned out, responded that she wasn't sure if it was “...burnout or laziness (laughs)...” (Female, M02), suggesting that even in a more supportive work culture there may still be difficulties in recognising burnout. This difficulty in recognising burnout was echoed by other participants who described work environments where burnout was viewed as a weakness, and where there was enormous pressure to demonstrate strength by persevering even when exhausted, and unwell:

“Also, the attitude of senior colleagues as they believe in juniors suffering as they suffered and believe mental health is not an issue but simply a sign of weakness.”

(Female, Za01)

Although the prevalence of burnout was generally accepted as being high among colleagues, participants spoke about an unwillingness to speak about burnout. Some worried that if they admitted burnout at work, it could be used against them, or their performance would then be scrutinised more closely, exacerbating their stress:

“So yes, I do think that burnout is very prevalent, but I do think it's stigmatized and I don't, I think uh doctors don't like to talk about it... so if you say that you've got burnout, then you know, people start looking at you, will you be able to do your work um, you know, and looking for where you slip. So, that's why I think, uh well in our country, people do not like to mention that.” (Female, SA08)

Other participants described a more general stigma around mental health issues in their culture and a lack of resources to address mental ill-health and felt that this was reflected in

attitudes towards burnout. When a participant from Zambia was asked if he thought that this deterred physicians from seeking help for burnout he responded:

“The stigma is very, very high when it comes to mental health... that's why now, you have really to counsel someone for them to accept, to go for that, and also our African culture (laughs). You are not supposed to, to be seen to be, it's seen as a weakness... So, when they see you going to seek help, they will actually be what's wrong with you?” (Male, Za05)

In summary, burnout is often perceived as weakness or laziness. Physicians are also concerned that to admit to being burned out will invite uncomfortable scrutiny of their work performance, or that it could be used against them. As a consequence, especially where provision for mental health needs is already poor, physicians are deterred from seeking the help that they require.

7.7 Coping strategies and possible solutions

Interviewees were asked about their personal coping strategies, and both interviewees and questionnaire participants were asked to describe possible solutions for FP work stress in their country. The following sections will explore the theme of coping strategies and possible solutions using the sub-themes of personal, relational, and organisational strategies and solutions.

7.7.1 Personal

Personal coping strategies and possible solutions fell into two main categories. The first was self-care and self-improvement activities; the second was seeking professional help. The self-

care and self-improvement category was broad, encompassing everything from exercise and pursuing a healthy lifestyle to reading self-help books. Participants spoke about outside interests such as hobbies helping them to relax; the importance of ensuring they had adequate rest and sleep; journaling; taking time in nature; and mindfulness or meditation. Participants also spoke about their faith being an important part of coping with stress:

“Every morning, I read the Bible and spend time in prayer. And this daily time helps me to do what God has asked us to do that is to cast our concerns and worries on him and know his empowering.” (Male, SA05)

Some spoke about the importance of setting boundaries to prevent work from spilling over into rest time:

“Yes. So, I mean I'm trying my best because I think now what I do is that what, what I plan to do for future is that whenever I'm on leave, I will announce, I put it all in the emails who the contact everything so that they would try to reduce the, the call.”
(Female, M03)

Others acknowledged that they had personal coping strategies that were less helpful such as withdrawing, comfort eating, or consuming alcohol:

“Um, the, the, the eating thing not, not necessarily a helpful coping strategy, but it is a coping strategy of sorts.” (Male, SA10)

Some participants discussed the value of courses or workshops in helping them to recognise and to manage burnout, and one participant had taught herself CBT, using it to manage her stress. Many participants also spoke about seeking professional help to cope with their stress. For some this was in the form of medication, such as antidepressants or anxiolytics. For others it was psychological support, such as counselling, psychotherapy, or seeing a life coach:

“It's better at times. And then when I see oh my anxiety levels are up again, then I make a plan to see my life coach again, um chat to my boss as well and like rather talk about it than like trying to hide it away.” (Female, SA12)

Provision of professional support, especially psychological support, was also commonly discussed as a possible solution to the problem of high levels of stress, as was the introduction of mandatory mental health days. Questionnaire respondents as well as interviewees discussed the importance of access to counsellors for therapy and debriefing with some suggesting that these counsellors or psychologists should have specific experience in treating physicians. Several interviewees suggested that having some sort of helpline would be beneficial:

“...like a crisis hotline or someone to reach out to. Like you could e-mail them or chat with them. Yeah. That I, I think that would help... I know some specialists they don't even talk to their junior doctors... So maybe in those cases, maybe they don't have anyone to talk to, right? So maybe something anonymous, we have a family physician association, so something like that. Like they could have a helpline, yeah.” (Female, M01)

Others went a step further, suggesting that regular, rather than crisis, access to a clinical psychologist should be provided:

“Actually, I would recommend that every Doctor should do at least once in a while, maybe once a year, or anytime or at least once in a year he should do, have an interaction with either clinical psychologist or a life coach.” (Male, Za07)

7.7.2 Relational

Relationships with family and friends were described by most participants as being an essential element of their coping strategies. Socialising with friends, having a safe space to 'vent' frustrations, and spending time with family, were all mentioned as important ways of coping with work stress:

"...I also do a lot of homework for, for my kids at home. So, I'll find that as a way of leaving my stress. So, I'll call them around then we'll go through their homework and tell stories and so on..." (Male, Za05)

In addition, supportive relationships with colleagues at work were also described as being part of effective coping strategies:

"So, I mentioned about how I cope with the stress. It's like getting to know your team member who's in your clinic and try to become um, a, a team." (Female, M04)

A key part of having a supportive team at work is good communication and several participants discussed the importance of this with regard to coping with work stress. Related to good communication is the importance of being able to debrief with colleagues, who understand the work situation:

"...I've got some, my other family physician colleagues are great, we, we really feel the same pain, we, we, we are able to share our, our frustrations and, and it helps to have somebody to unpack, and, and work together as well, you don't feel alone, you, you, you work um, work, your team's working in the same direction and it helps to know that your people are in the same boat..." (Male, SA01)

Another participant from Sri Lanka described how working together with work colleagues to balance shifts and cover for each other also helped to alleviate stress:

“So, this morning these are the doctors this afternoon who is coming. So, there is no questions among them. If I can't go tomorrow, then I call to other one of my friend, you do tomorrow I will do you other day like that.” (Female, SL04)

Solutions for the problem of work stress focused on incorporating team building activities at work, improving communication with colleagues, and facilitating professional support networks:

“...for family physicians, I think it's important to have a peer support group and maybe it could be informal, um I, I think that really helps.” (Female, M01)

Additionally, participants highlighted the need for adequate time to pursue stress relieving activities with friends and family, acknowledging that, in many cases, this would require a reduction in workloads.

7.7.3 Work-related

Also, within the theme of coping strategies and possible solutions, work-related strategies and solutions were discussed. These included personal work strategies such as delegating to manage heavy workloads; good organisation of work and home life; and creating boundaries between work and home life; as well as wider system solutions such as better pay; improved referral networks; reduced workloads; altered shift systems; and adequate staffing levels. Some felt that their workplaces should arrange social events, retreats, stress awareness workshops, and provide training for managing stress. One participant from Zambia summarised the changes she felt were necessary:

“Better working hours, better pay considering the number of hours. Vacation time.

Social support groups and safe spaces where one can vent and speak with no judgement.” (Female, Za01)

Also discussed as important was the working environment. Some described very basic on-call facilities with no amenities and one participant from Zambia suggested that the provision of better facilities would improve stress levels:

“...you're lucky if you need to have a microwave to warm your food. We put money together as doctors to buy that microwave. We put money together as doctors to get that fridge if we want to. We have this bed which you share and sometimes like, right now it's even easier that it's two beds in the room. Previously we'd actually sleep two doctors on one bed from two different departments because there was not space, you know. So, we need the conducive working environment.” (Female, Za03)

In summary, work-related coping strategies and solutions encompassed more personal strategies, such as delegating, as well as wider organisational or system changes. Many of the organisational changes were discussed in terms of reducing demands and improving availability of, and access to, resources.

7.8 Integration of quantitative and qualitative results

This study was designed as a mixed-methods triangulation study where the qualitative strand, and qualitative findings were used to corroborate and confirm the quantitative findings as well as to reveal facets of the burnout phenomenon that might be lost in the quantitative data, enhancing the completeness of the findings. Estimates of burnout prevalence from the quantitative data were high with over three-quarters of those in the overall dataset scoring ≥ 2.25 on the exhaustion subscale and ≥ 2.1 on the disengagement

subscale. Similarly high prevalences were estimated at the individual country level.

Qualitative data provided insights into the imbalance of demands and resources that might underlie this, and what this high prevalence of burnout might look like at the individual level, with interviewees describing stressful work environments and serious consequences of this stress for their health and well-being, as well as for their wider communities and their work organisations. An additional qualitative finding was the concept of stigma surrounding the acknowledgment of high levels of stress and burnout.

Qualitative findings corroborated quantitative findings around associated factors, suggesting that the factors found to be statistically significantly associated with burnout were important at the individual level. These findings are summarised in Table 7.3. In addition, while the quantitative data identified that being treated fairly at work was a statistically significant factor associated with burnout, the interviews provided important additional detail regarding the factors that motivate physicians; the work values they hold as important; the impact of dissonant work values; and the importance of reward both in terms of adequate salaries, but also in terms of respect and recognition. Although the quantitative data provided some insight into coping strategies, identifying exercise as a significant coping strategy, and highlighting the importance of support for coping, the qualitative data added detail and depth to this as interviewees discussed a broad range of coping strategies and possible solutions to the problem of work stress. Furthermore, while quantitative data suggested that turnover intention was directly associated with burnout, qualitative data revealed that for most participants leaving medicine would be contemplated only as a last resort, and the preference would be a move to a similar medical position but with improved working environment rather than a move out of medicine altogether.

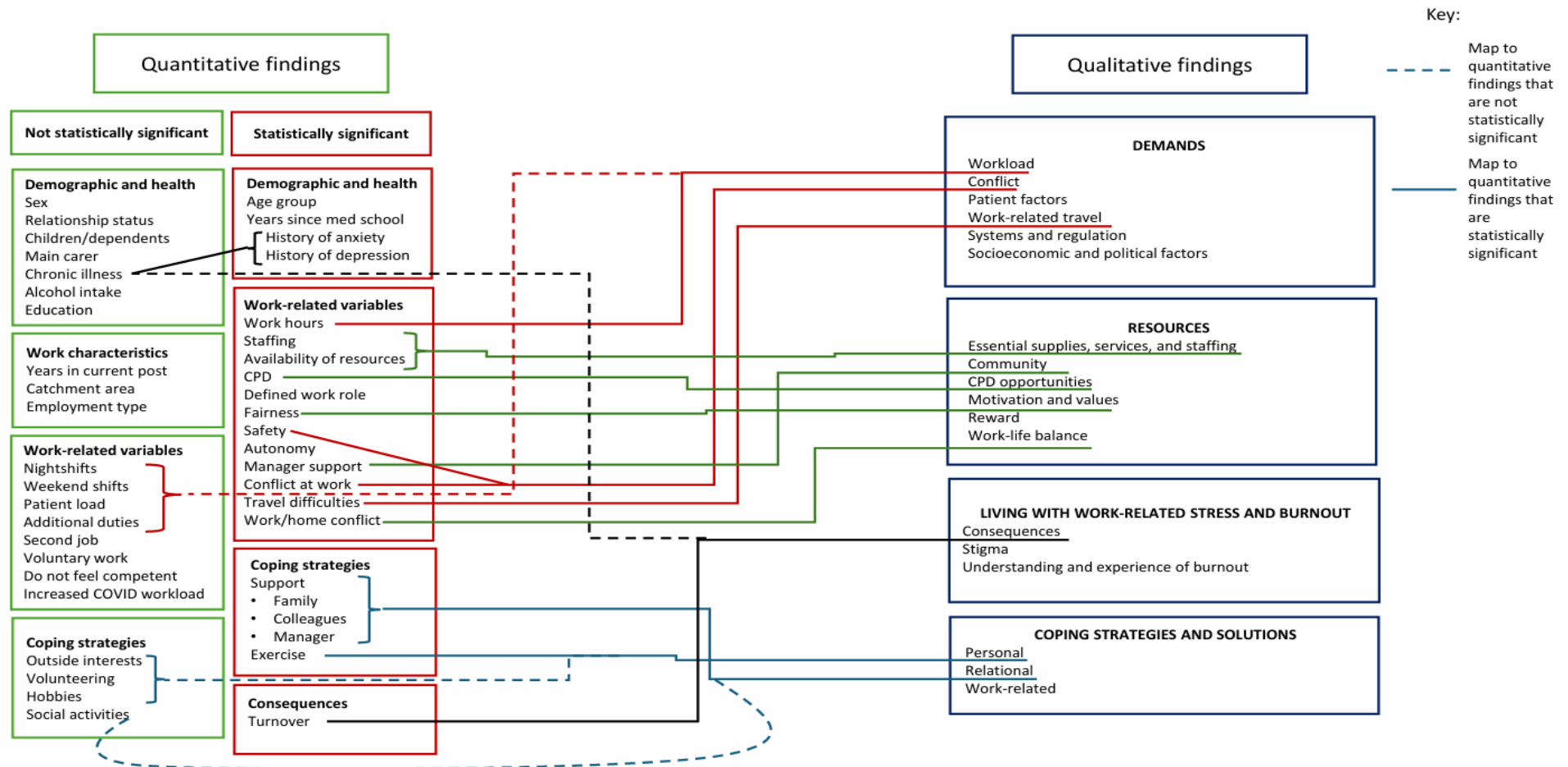
The qualitative data also revealed some unexpected stressors, contributing to the completeness of the findings. These included the patient factors of literacy levels and health beliefs; socioeconomic factors such as poverty; and regulatory factors such as the lack of regulation of pharmacies and of illegal or unqualified medical practitioners. The differences between countries, identified in the quantitative results, were not obvious within the qualitative data. However, within the qualitative data two clear differences between countries emerged. The first was that a difference in the health system specific to Malaysia, where family medicine sits under the purview of Public Health, was identified as highly stressful by Malaysian participants both in the interviews and in the open-ended response items on the questionnaire. The second was that although most participants identified difficulties in taking rest breaks, participants from Zambia described extreme difficulties in taking the personal leave that they were due, with the result that several had not had annual leave for two years or more. In summary, the qualitative findings confirmed the quantitative findings and added additional depth, detail, and richness. Furthermore, unexpected findings from the qualitative data included the stigmatisation of burnout, and several unusual stressors including patient factors such as literacy level, and socioeconomic factors such as poverty. The relationships between the quantitative and the qualitative findings are mapped in Figure 7.1, which follows Table 7.3.

Table 7.3 Integration of quantitative and qualitative results

Statistically significant factors associated with burnout	Data extracts
Age group (20-29; 30-39; 40-49; 50+) and/or Years since completing undergraduate medical school (0-10; 11-20; >20)	"I think one gets to accept those things that you cannot manage or those things that you cannot do, and you also start to manage, um manage your stresses better and try to avoid um situations where uh you find that you have too much stress." (Female, age group 50+, SA08)
I have been diagnosed with or treated for anxiety and/or depression	"I was suffering from hm palpitations, stress and anxiety, I have taken six months antihyp, uh anti, uh depressant drugs like SSRIs." (Male, P01)
The resources I need to carry out my duties are not always available	"The lack of or shortage of things to use make work really difficult and have to improvise. This makes delivery of service even harder and leads to frustration." (Female, Za01)
We are often understaffed	"They should give me at least three to four family physicians instead of just two. We are now, now running with two only. Yes. So, when one is on leave, it's, it's overwhelming." (Female, M03)
Work offers me opportunities for continuing professional education	"Yes, they gave me opportunity. But in terms of the dedicated time to go for training that is a bit of a, I don't know whether to say problem, but it's quite challenging..." (Female, M03)
I have a clearly defined role at work	"I feel as though the role, the roles are clearly defined." (Female, Za02)
I am treated fairly at work	"...fairness is one of them, fairness is actually one of them, because it's actually difficult to be fair with what I've seen at, at my workplace. So, you'll find you'll find people, some people are more favoured than others." (Male, Za06)
I feel safe at work	"I am the only person working as late as I am in my whole building so I suppose I would potentially be vulnerable if something were to happen" (Female, SA02)
I have the autonomy to make decisions in my workplace, such as how to structure my schedule	"...if I get a little bit of autonomy at work, I'm happy with that, and the rest I'd rather just plug in to where the boss sees me um being best applied." (Male, SA10)

Statistically significant factors associated with burnout	Data extracts
There is often conflict at work	"...so, there is quite a lot of conflict with patients as well and, and a lot of complaints ..." (Female, SA07)
My work and home responsibilities do <u>not</u> conflict	"So, it also to balance medicine with family life I think is, I found very stressful." (Female, SA08)
I have difficulty travelling to work	"...our doctors, they are getting much problems with the heavy traffic. So, when they catch in middle of the, the heavy traffic they can't move the vehicles now so they can't come on time. So that make them stress." (Female, SL04)
My manager is supportive of me at work	"... so, I think my managers uh are a source of support and I think as I've um gone on my own journey of career progression my eyes have been opened to how much they do support or try and support..." (Male, SA10)
Family support helps me to cope with the pressure of work.	"Well, my family is very supportive and my, my wife is also doctor, so she understands my work..." (Male, SL01)
Manager support helps me to deal with the pressures of work	"...management adapted and learnt quite quickly so I think there was quite a good support system happening to the staff and we didn't really have that much turnover during that time..." (Female, SA03)
The support of my colleagues helps me to cope with work stress	"let's say we had a rough day, or we're fed up with a certain type of patient, we, we, we let it out at least with my colleagues in my district." (Female, M01)
Use exercise as a coping strategy	"If you feel very frustrated, you just go for a walk or go for hiking in the woods. So, for me, that's a mood booster that, that really helps." (Female, M01)
I often think about leaving my job	"Actually, I wanted to quit at some point. Not to quit medicine as a whole, but I wanted to quit and join the private sector" (Male, Za06)

Figure 7.1 Mapping relationships between quantitative and qualitative findings



8.1 Introduction

Although this thesis utilised established methodologies, its multinational ambition brought numerous challenges. This chapter will discuss and reflect on some of the challenges and learning during this research. It will begin by exploring the challenges of process and the administrative requirements for formalising the collaborative partnerships necessary for conducting multinational research. These requirements, such as completing due diligence processes with partner institutions, are not limited to KU but are wider requirements within research collaboration (Stergiou et al., 2021). This will be followed by a discussion of the challenges in determining the ethical requirements to conduct this research, and in obtaining ethical approval from multiple institutions. Finally, the legal requirements for data protection and data sharing across borders, and the implications for this PhD will be explored before the chapter concludes with possible solutions and personal reflections.

8.2 Due diligence and service level agreements

Conducting research typically involves overcoming several challenges. For this PhD, the challenges involved in formalising collaborative partnerships and applying for ethical approval across six different countries were significant. The formalisation of partnerships began with the due diligence process, followed by negotiation and approval of SLAs with the collaborating institutions. Despite the relative simplicity of this research in terms of methods, the fact that data was collected from medical professionals rather than patients, and the small budget, the process was the same as that required for complex drug trials involving large amounts of funding, although the forms for due diligence and the SLA were simplified

accordingly. The due diligence process, carried out by KU to mitigate risks, including financial risks, and to ensure partner institutions had the necessary research capacity and expertise, was commenced immediately following ethical approval from KU Faculty Research Ethics Committee (REC), in September 2021.

The way in which each of the partner institutions navigated the formal legal processes of due diligence and negotiation of SLAs differed markedly. The first institution to complete the due diligence process and sign the SLA was KMU in Pakistan. The collaborating partner at the University completed a modified, shorter due diligence form as KU had recently completed due diligence with them for another study. This was quickly approved by KU and an SLA drawn up and signed by the collaborating partner on behalf of KMU. An application was then made, by the collaborator, to their ethics committee, and ethical approval given by the end of February 2022. In fact, due diligence was completed for the remaining five countries by the end of January 2022, but the SLAs took considerably longer. The requirement for an SLA for SU, South Africa, was eventually waived in view of the existing partnership between KU and SU, and when it became clear that the cost of proceeding with one, in terms of both time and money, would be substantial. MakUni, Uganda, signed the SLA after requesting only minor modifications just over one month after completing due diligence, however, both the UoM, Malaysia, and the UoSJ, Sri Lanka, requested considerable additions to the SLA involving both co-authorship and data sharing clauses. These additions were entirely reasonable and, although data sharing and co-authorship had been discussed and agreed more informally with our collaborators, it was perhaps an oversight on our part that they were not included in the originally drafted legal agreement. The UoM SLA was finally signed in June 2022, six months after completion of due diligence, and the UoSJ notified KU of their agreement in October 2022, nine months after completing due diligence. Due diligence for the UNZA was completed in early November 2021 but approval from their legal counsel for

the agreement took a further 11 months, finally being signed, unchanged, at the end of October 2022. Resource constraints within partner organisations with regard to reviewing complex legal documents must be considered as a potential contributor to delays.

8.3 Ethical approval

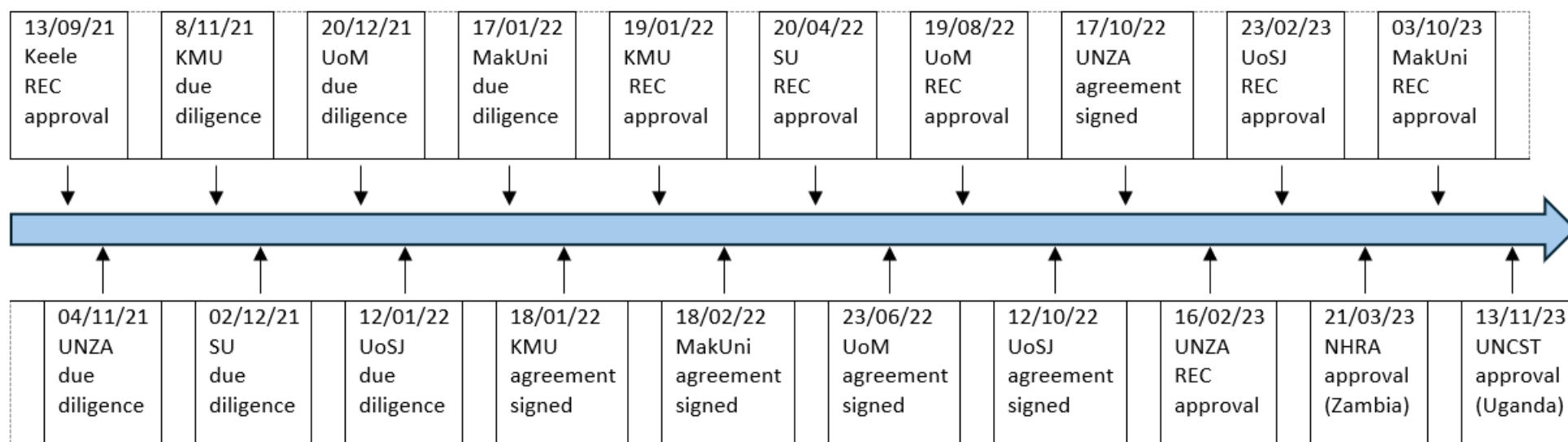
Additional ethical and methodological challenges were also faced. These included: determining initially whether ethical approval was necessary in each country; guaranteeing legal and secure movement of online data across borders; and planning for secure data sharing with countries outside the EU. Before applying for ethical approval, two main questions must be answered: who is responsible for ethical approval; and what are the requirements and processes in the country of interest (Griffin and Leibetseder, 2019; Song, 2019; van Teijlingen and Simkhada, 2012). Ethical requirements and guidelines are clear for biomedical research involving therapeutic interventions and where the research subjects are patients. However, for studies such as the one described in this thesis, an observational study collecting data online from professionals rather than patients, the application of universal ethical principles and thus, the requirement for formal ethical review, may vary considerably between countries (Bamdad et al., 2022; Claudot et al., 2009; Cuttini and Saracci, 2009; Edwards et al., 2012; Glasziou et al., 2021). For example, in France, only biomedical studies i.e., those involving an intervention or non-routine patient monitoring, require IRB approval. A study collecting data using a questionnaire would not require IRB approval unless the questionnaire was collecting sensitive information with the potential to cause psychological harm (Claudot et al., 2009). However, France has two regulatory bodies that advise and authorise studies that do not require IRB approval but involve the use of personal health data, ensuring that they comply with universal ethical principles. An observational study,

collecting personal health data would require authorisation from these bodies (Claudot et al., 2009). This differs from other countries such as the USA, which do not have these additional regulatory bodies and where IRB approval would be required for observational studies (Lemaire, 2006). In addition, the increasing use of social media sites to disseminate questionnaires for online survey research results in a lack of geographical boundaries for research projects recruiting in this way, and thus, there are ambiguities over what ethical approvals are necessary for these types of studies (Bamdad et al, 2022).

This highlights the importance of involving local collaborators/co-investigators who can provide information about local ethical requirements and processes, ensure that the research results are made available locally to benefit local communities and, if necessary, act as local advocates for the importance of the research to the communities in question. It also highlights the urgent need for clear ethical approval guidelines for forms of research other than biomedical research, such as online, non-clinical studies, where ambiguities persist and where regulation has not kept pace with technological advancement. For this study, advice from local collaborators confirmed the need for IRB approval in each of the six target countries. In addition, Uganda required approval from the UNCST, and Zambia required approval from their NHRA, before data collection could begin. Furthermore, KMU, Pakistan, has a slightly different process from the other collaborating institutions whereby 'desk approval' can be given quickly and efficiently for low-risk, observational studies, which is then followed by formal approval from the full committee. Data collection can begin once 'desk approval' is granted. This considerably streamlined the process at KMU and meant that data collection could begin within just a few months of completing due diligence. Perhaps this is a system that other institutions could consider adopting for low-risk studies.

Once SLAs were signed with each institution, work began on the applications for ethical approval. Ethical application forms were completed, and the study documents sent to collaborators for inclusion with the ethical approval applications. Preparing these applications was time consuming as each application form was different and some of the ethics committees required extra documents. For example, SU required a local protocol synopsis to be submitted alongside the research protocol, and the format required by both the UNZA and MakUni ethics committees for the research protocol was quite different from the format submitted to KU Faculty REC. In addition, Uganda's requirement for both local level institutional ethical approval and national level ethical approval from the UNCST meant that the payment of ethics fees in Uganda required invoices from both the UNCST and MakUni. Initially, invoices were made out to our collaborator in Uganda, rather than being made out to KU, and it took over six months to obtain the necessary invoices made out to KU for payment of the ethics fees in Uganda, creating additional delays. Delays with the agreement of SLAs, compounded by the time that the ethical approval process takes in each country, required considerable administrative organisation, substantially delayed data collection, and consequently, added over 18 months to the research timeline (see Figure 8.1).

Figure 8.1 Timeline for due diligence, service level agreements and ethical approval (13/09/21 – 13/11/23)



In fact, further, substantial, administrative delays with our ethics application to MakUni (submitted January 2023, resubmitted following feedback, February 2023; application approved October 2023) resulted in a decision being made, in discussion with the PhD supervisory team, to exclude Uganda as there was insufficient time remaining within the PhD for data collection and analysis. An additional consequence of these delays, common to most multinational research projects, is that of increased costs. This project did not have funding for paid research assistant or collaborator time (collaborators were essentially working pro bono), but for projects where collaborators are being paid for their time these delays would add a substantial amount to the overall budget. This is not only a consideration for global health researchers applying for funding but must also be a consideration for the funding bodies that fund global health research.

An additional challenge, allied with seeking both local ethics oversight and oversight from the home institution, is that of multiple reviews of the same study protocol and study materials (Dove and Garattini, 2018). This is both redundant and time consuming, and may result in multiple, differing review opinions which impact the consistency of study materials (Dove and Garattini, 2018; Greene and Geiger, 2006). However, multinational studies must balance the need for standardisation of their study protocol and documents with the need to ensure that the study is locally appropriate and culturally sensitive (Parker and Bull, 2009). Differences in what is deemed by local IRBs to be locally acceptable may prove challenging to resolve in a way that does not lead to variability in the protocol and/or study documents. However, this could be streamlined by the provision of guidance for multinational studies on what changes to study documents are significant enough to warrant re-submission to IRBs. For example, changes in wording, if just to clarify meaning, could be deemed to be acceptable without re-submission. Interestingly, available evidence suggests that in general, multiple reviews do not result in improvements to either the study design or to the

protection of participants (Barnett et al., 2016; Greene and Geiger, 2006; Infectious Diseases Society of America, 2009; McNair, 2022). Multiple reviews of the protocol and study documents was indeed a challenge for this study and resulted in some variation in study documents. Recruitment for the questionnaire, initially planned to be via email, was completed quickly and efficiently in Pakistan via an email mailing list. However, the IRB in South Africa requested the addition of extra recruitment detail to the protocol, including dissemination of the questionnaire via social media sites, and this led to the development of an extra study document that could be used to advertise the study on social media. This then had to undergo ethical approval from the home institution (KU) as an amendment and was added to our ethics applications in the four other countries where ethical applications had yet to be submitted. Although this caused only minor variability, these inconsistencies add a layer of complexity to this type of study, as well as contributing to delays. Furthermore, during the ethics application process a request was made by the Ugandan collaborator to include reimbursement for data costs for participants. Unfortunately, there was no funding available for this, and this, together with the fact that data collection had already proceeded in several other countries without reimbursement of costs for participants, meant that this amendment could not be agreed. These negotiations around changes to study design and documents can be challenging, especially where requested changes cannot be made.

8.4 Data protection and data sharing

Another challenge for this PhD was the issue of data protection and the movement of personal data across borders. This is an increasingly important issue with the rise in online data collection. UK General Data Protection Regulations (GDPR) do not permit the transfer of personal data to countries outside the EU unless the country has an 'adequacy decision'

meaning that its data protection regulations are deemed adequate by the EU (Aaronson, 2019; Sullivan, 2019). An exception to this is if supplementary measures have been taken to safeguard the data such as pseudonymisation or anonymisation (Crutzen et al., 2019). The ease of collecting data online from participants in any geographic location risks that issues of data protection and data movement across borders are overlooked. If personal data is collected via internationalised professional social media sites rather than through specific intra-country networks, there is no way for other countries to monitor, regulate, or agree the data flow across borders into our data storage in the UK.

This PhD combined an online questionnaire, with online semi-structured interviews.

Although this design is technically straightforward it required the movement of data across international, non-EU borders. Participant data moved out of the home country for analysis and storage in the UK, and then, once anonymised, moved back to the home country for use by the local collaborator. In view of this a DPIA form was completed and submitted to Keele's data protection officer. Advice was also taken from the IT department over the most secure way to share the data at the end of the study. Formal data protection and data sharing clauses were required by two of our collaborating institutions and the negotiation of these additions to the SLAs contributed to delays for both the UoM and the UoSJ. As per EU GDPR for safeguarding personal data, the data sharing agreement only allows for fully anonymised data to be transferred from the UK to non-EU countries. Therefore, the country-specific data sharing plan is to share only fully anonymised data securely via SharePoint with named owners at the end of the study. Issues of data flow across borders, data sharing and data protection are complex, especially regarding research data collection using the internet, and they add extra layers of complexity to a multinational study. Clearer guidance for international researchers around data protection and data sharing is required to more effectively deliver multinational studies in the future.

8.5 Possible solutions

With the increasing globalisation of research, multinational collaborative studies are becoming more commonplace (West, 2018). While this brings benefits such as improvements in global health, reductions in inequity, shared costs, shared expertise and resources, and shared innovation and training (Crisp, 2008; Godoy-Ruiz et al., 2016; Joss and Keleher, 2011), these studies share many of the challenges outlined above. The impact of these administrative requirements on global health research, where collaborations are essential, is significant and costly and therefore, it is vital that ways of streamlining the process are explored.

One possible solution for streamlining the due diligence process is for institutions to build, and regularly update, their own database of information gained through due diligence. This could also be done collaboratively with partner institutions. Thus, applications from new research projects seeking to collaborate with institutions that are already in the database could be fast tracked. In addition, it would provide a track record of partnership for future collaborative funding applications. This would certainly reduce delays although it was negotiating SLAs, rather than the due diligence process, which created the greatest delays for this project. It is more difficult to identify ways of reducing the delays created by negotiating and agreeing SLAs as these are project specific. Perhaps SLA templates for different types of trials could be developed, however, this would not necessarily reduce delays around negotiation of the details within the agreement. Broader agreements such as a Memorandum of Understanding (MOU) may also be worth considering. Although MOUs are not legally binding and may take significant time to negotiate, the presence of an MOU might facilitate agreement of other more specific contracts. These issues of process and the time

that they take should be considered early in the research planning process, and generous time allotted to them in the research timeline. In addition, funders, including those funding PhD studentships, should be aware of the additional administrative requirements for multinational research projects, and the potential for delays, and funding should reflect the additional time requirements of these projects.

One of the more obvious solutions to a lack of information about ethical processes in other countries is collaboration with local researchers who have local knowledge about such processes (Song, 2019). The advantages of partnerships with local researchers are not limited to accessing information about local ethical processes but include local expertise and research networks, access to information about local research needs and relevant cultural issues, and a balancing of the equity scales in global health, with opportunities for local capacity building (Faure et al., 2021). These partnerships should be the norm in multinational research. A second solution for the lack of information about local ethical processes is to set up repositories or databases containing this information. Cochrane (2019) recommends that institutions set up their own ethics databases with information held about each country that they have sought or obtained ethical approval from along with the authorities involved and any special requirements that the country has. This could include the type of research that approval was sought for, guidelines for institutional approval at any partner institutions including the cost of application, and details of local contacts, and could be combined with the database of due diligence information. Institutions should also have a way of signposting global health researchers, especially students and early career researchers, to these information resources. A centralised, institutional, repository of information about requirements and processes for multinational research, how to go about fulfilling those requirements, and estimates of how long these processes might take, would have been of significant benefit to me as an inexperienced global health research student. Alternatively, a

broader solution along similar lines might be a central, international repository of information about the ethical requirements and processes in different countries, along with a list of contacts for various permissions such as department of health information. This could be maintained by a global NGO such as the WHO, for example.

Barchi et al. (2014) recommends greater collaboration, not just between researchers but between IRBs. They point out that the ethical priorities often differ between countries, suggesting that USA priorities are often autonomy, beneficence, and non-maleficence, whereas the priorities of non-USA countries include justice, protection of vulnerable populations, care standards, and post-trial access to benefits (Barchi et al., 2014; Hyder, 2004). Therefore, collaboration, including shared systems for assessing protocols as well as more direct communication channels, could provide insights into different ethical processes and priorities, increase trust, and open the way for greater harmonisation of decision making (Barchi et al., 2014). Along these collaborative lines, the legal concept of adequacy could be applied to the ethical review process (Rothstein et al., 2019; Thorogood and Beauvais, 2021). Adequacy is a concept which allows one country to defer to the legal protections of another and implies that their laws in a particular specified area, e.g. data protection, are considered to be of equivalent rigour (Rothstein et al., 2019). It is the same principle as that of the adequacy agreements the EU has developed for data protection which allow for data transfer to countries with data protection laws deemed to be equivalent to EU GDPR. Although the idea of ethics adequacy agreements has been specifically suggested within the field of genomics research, there is potential for it to be applied to other forms of health research. In addition to adequacy at the level of the national regulatory framework, the application of adequacy to research ethics approval would require equivalence in IRB effectiveness. This would be the greater challenge to assess, especially in LMICs where there may be constraints on research ethics capacity (Thorogood and Beauvais, 2021).

In practice, this would mean that a lead researcher, conducting research in a country which had an adequacy agreement with the lead researchers home country would only have to seek ethical approval within their home country. With reference to this research, this would have meant that data collection, in each of the target countries that had adequacy agreements with the UK, could have started in September 2021, as soon ethical approval had been granted from the home institution. If even three out of the six target countries had ethics adequacy agreements with the UK it would have saved costs, as well as significant amounts of time, and allowed data collection to begin at least six months earlier, depending on which of our target countries had adequacy agreements with the UK. This has the potential to significantly streamline the ethics process for many multinational studies.

Thorogood and Beauvais (2021) discuss several advantages and disadvantages of an adequacy system applied to research ethics approval. The most obvious advantage is the elimination of duplicative review processes with the consequent risk of variability in protocol and inconsistency of study materials. In addition, an adequacy system preserves sovereignty and would be flexible, allowing countries to safeguard certain types of research, such as culturally sensitive research, by imposing exclusions or conditions. Furthermore, such a system promotes greater collaboration for information exchange, and community building between regulators. However, there are also some significant disadvantages. Such a system may be costly and highly bureaucratic and may limit opportunities for capacity building in LMICs, where the foreign researcher is from a HIC. However, for researchers from LMICs, wishing to do multinational research, adequacy agreements would reduce the administrative complexity, encouraging multinational research by LMIC researchers. Politics may also influence adequacy decisions. LMICs might be reluctant to negotiate adequacy agreements with HICs amid concern that this would undermine the autonomy of their own IRBs, perpetuating colonialist disparities and attitudes. However, this could be counterbalanced by

additions to the adequacy agreement that promoted health benefits, and capacity building in the LMIC, and required data sharing. Finally, to significantly impact multinational global health research a 'critical mass' of countries would need to be involved, and there would need to be a degree of standardisation of exclusions and conditions (Thorogood and Beauvais, 2021). Despite the disadvantages, the idea of adequacy agreements for streamlining ethical approval in multinational research warrants further exploration. An alternative solution to these collaborative or adequacy ideas would be the creation of a centralised ethics committee, run by either a designated country or a nominated international organisation such as the WHO. This would provide ethics decisions specifically for multinational studies and individual countries would retain the autonomy to choose whether they recognised the ethics decisions of this centralised body for their own multinational studies.

8.6 Personal reflections

There is an extra layer of administrative complexity for global health research that may not be initially apparent to a student or early career researcher. Certainly, for me, this was a steep learning curve and one that challenged both my morale and my administrative and project management skills. It was not only difficult sometimes to find the information that I needed, but also to know how much and how often to chase these processes in our partner countries. Throughout each stage of the due diligence, agreements, and ethics processes I kept in regular email contact with my collaborators. Despite this, it is possible that I could have done more to speed up the processes, although much was delay at the institutional level over which neither I, nor my collaborators, had control.

Nevertheless, going forward I have learned to allocate sufficient time to these processes. I have also gained in administrative and project management skills, and in knowledge of what processes are required and who to contact for help in completing them. It is interesting to note that support is often mentioned as a factor that reduces or prevents burnout (Leiter and Maslach, 2003) and therefore it has been hugely important for me to know who to contact for support with aspects of my study such as support with completing the due diligence process, support and advice about data protection and data sharing issues etc. On a personal level the factor that would have made the biggest difference for me would have been a centralised KU database of information and contacts relevant to global health research projects, possibly linked to the Institute of Global Health and Wellbeing webpage. Issues around funding have also affected me as a result of substantial delays and this warrants consideration for other global health research projects. As a PhD student, attempting a multinational study within a funding period of 3 years was difficult and stressful given that I experienced administrative delays of over 18 months. Funding for an extra year, making it a 4-year PhD, would have made a significant difference, and been much more achievable. These unavoidable delays have considerable implications for the feasibility of multinational global health PhDs within the current 3-year PhD framework. Certainly, it is important that the likelihood of significant administrative delays is considered early in the planning for any global health research project and built into both the timeline and the funding of the project. However, despite the challenges faced, the experience I have gained from this PhD has been invaluable and an excellent preparation for future global health research projects.

8.7 Conclusions

In conclusion, increasing globalisation is leading to an increase in multinational research projects and international collaborations. However, there are significant challenges to conducting multinational research projects. These include substantial delays to the research timeline caused by the need to complete due diligence and negotiate research agreements with collaborating institutions, ambiguities around what ethical approval is required for different types of studies, difficulties in obtaining information about ethical review processes in different countries, multiple IRB reviews that may introduce inconsistencies in the protocol and/or study materials, and increased costs. These challenges impacted my own research and had a significant impact on my research timeline and also my morale throughout the study. My experience has led to discussions with the Institute of Global Health and Wellbeing at KU around how some of these challenges may be acknowledged and mitigated. Possible solutions include increased collaboration with local researchers; the creation and maintenance of databases containing due diligence information and country specific information about ethical review processes; clear guidelines for the ethical review of different types of studies especially non-clinical studies involving online data collection; increased international IRB collaboration; and either ethics adequacy agreements between countries or a centralised ethics committee specifically for multinational studies. These solutions are not themselves without challenges, however, the benefits of streamlining the legal and ethical processes for multinational studies are significant, and all possible solutions warrant serious consideration.

Chapter 9 Discussion and conclusions

9.1 Introduction

This final chapter presents a discussion of the findings of this PhD. It begins with a summary of the key findings, relating them to the research aims and objectives. Subsequent sections discuss the findings as they relate to the wider literature, the strengths and limitations of the study, and the implications, for health systems, for organisations, for individuals and for future research needs. This is followed by conclusions.

9.2 Research aims and objectives revisited

The aims of this PhD, as presented in Chapter 2, were to investigate the prevalence of burnout in FPs in LMICs, to identify the factors associated with burnout, and to explore the experience of burnout. This was in response to the paucity of data identified by the systematic review, the abundance of risk factors present in LMICs, and the significant consequences of burnout (as detailed in Chapters 1, 3, and 4). To achieve these aims, three objectives were set: the first was to estimate the prevalence of burnout; the second to identify any associated factors, including risk and/or protective factors; and the third to explore factors related to work-related stress and burnout in FPs in LMICs. Data was collected from FPs and generalist physicians in five LMICs (Pakistan, South Africa, Malaysia, Sri Lanka, and Zambia) using a mixed methods approach. A questionnaire was disseminated to FPs, or those generalist physicians working in community settings, generating a combined sample from the five countries of 451 participants that exceeded the target sample of 385. The questionnaire contained the burnout measurement tool (OLBI) and collected additional

demographic, workload, and workplace data. Following collection of the questionnaire data, interview participants were recruited from the questionnaire participants and 33 semi-structured interviews were conducted to explore individuals' experience of burnout, their coping strategies, and the perceived consequences of workplace stress.

In summary, findings revealed that over three-quarters of the combined dataset were at high risk of burnout (defined as a mean item score ≥ 2.1 on the disengagement subscale and ≥ 2.25 on the exhaustion subscale), and at a country level, the prevalence of burnout ranged from 74.8% in Malaysia, to 84.4% in Zambia. Burnout prevalence also varied by age and gender with the oldest age group (50+) having the lowest prevalence of burnout, and men having a lower prevalence than women, although the association of gender with burnout was not statistically significant. Of the 47 variables tested for an association with burnout, 20 had a statistically significant association with burnout, underlining the complexity of burnout. The factors associated with burnout also varied by country, but as country samples were below target for three out of the five countries, these results must be interpreted with some caution. Regression analysis identified two main risk factors: working more than 50 hours per week, and conflict at work; and two main protective factors: manager support; and a lack of conflict between work and home responsibilities. The qualitative data supported the quantitative findings around associated factors, as well as revealing some unexpected stressors such as the patient factors of literacy levels and traditional health beliefs. Additionally, the qualitative findings identified a variety of consequences of workplace stress, coping strategies, and possible solutions. These findings from the questionnaire data, supported by the interview data, meet the first two objectives, while additional in-depth data from the interviews, meets the third objective.

9.3 Key differences in sample size and characteristics

The total sample for the questionnaire was 451, with varying samples from each individual country. Differences in sample size between countries may reflect differences in size of FP population, differences in internet access and cost of access, the lack of compensation for internet data costs, and differences in the reach of our collaborators within each country. In addition, this research project was led by UK researchers, and this might have influenced willingness to participate as some physicians may have been concerned that the results would not have local impact, despite the involvement of local researchers, and assurances of data-sharing. Furthermore, there may have been cultural differences in willingness to participate in research (Barata et al., 2006; Petrova et al., 2007) or in perceptions of the salience of the topic. Finally, as the results demonstrate, FPs have heavy workloads and busy schedules, and this may have negatively impacted on recruitment.

In terms of the sample demographic, workload, and workplace characteristics, there were some noteworthy differences across the country datasets. The proportion of women was higher than men for the combined dataset, as well as for the South Africa and Malaysia datasets, but lower than the male proportion for the Pakistan, Sri Lanka, and Zambia datasets. The higher proportion of women overall in the study may reflect the increasing feminisation of the medical profession (Adikari et al., 2023; OECD, 2023; Russo et al., 2015). However, cultural factors in Pakistan, Sri Lanka, and Zambia, such as gender roles, may account for the higher proportion of male respondents in these countries (Mohsin and Syed, 2020; Raza et al., 2023). Alternatively, gender differences in willingness to participate in research (Busby and Yoshida, 2015), or to disclose gender, may influence these proportions. There were also differences in age group proportions between the countries with Zambia having the highest proportion in the 20-29 age group, and the highest proportion of those

who had been in their post for just 0-5 years. Zambia also had the highest proportion of respondents who, while fulfilling the inclusion criteria as generalist doctors working in the community, were not trained in family medicine. It is likely that these younger, early career doctors, who had not yet begun specialist family medicine training, account for the differences in age group and years in post. In addition, Malaysia had the highest proportion of participants with a master's or doctoral degree and this likely reflects the higher proportion of family medicine specialists in the sample as well as differences in training requirements between countries.

There were also some notable inter-country differences in employment and workplace characteristics. The proportion of participants in government employment was highest in Malaysia (95.1%), and lowest in Sri Lanka (49.1%), and only Pakistan and Sri Lanka had participants who worked in both government and private practice, probably reflecting differences in health systems and regulatory requirements. In terms of patient load, the samples from Pakistan and Zambia had the highest proportion of participants seeing more than an average of 45 patients per day (28.7% and 24.4% respectively), and Zambia had the highest proportion of participants working, on average, more than 12 weekday nightshifts in a month and, on average, more than six weekend shifts in a three-month period. The greater patient numbers in the Pakistan and Zambia samples, and higher out of hours workload for the Zambia sample, may reflect higher levels of understaffing and wider workforce shortages, a greater proportion of more junior doctors in the sample, or a combination of both. While the South Africa sample had a much smaller proportion of participants seeing very high average daily patient loads, it had the highest proportion of respondents working more than 50 hours per week and was second highest in terms of out of hours workload. Again, this probably reflects, in part, higher levels of understaffing and wider workforce shortages. Data from the WHO confirm that of the five countries in this study, Zambia has the lowest number

of doctors per 10,000 population (2.965), followed by South Africa (8.085), Pakistan (10.842), Sri Lanka (11.924), and finally Malaysia (22.281) (WHO, 2024). Furthermore, Zambia, South Africa, and Pakistan have higher burdens of disease, as measured by Disability Adjusted Life Years (DALYs) per 100,000, than Malaysia and Sri Lanka. Zambia has the highest DALYs per 100,000 at 53,934.56, followed by South Africa (49,954.28), Pakistan (48,022.12), Malaysia (26,886.78), and finally, Sri Lanka (24,579.83) (Roser et al., 2024). This combination of few doctors per 10,000 population and high disease burden, may explain in part the higher patient numbers, long work hours, and greater out of hours commitment in the samples from Zambia, and South Africa. Other factors potentially influencing patient load and out of hours commitment are differences in the role of the FP between countries, nature of employment (either government, private, or both), and the job role characteristics of the sample i.e. the proportion of the sample that are more junior, generalist doctors. In South Africa and Malaysia in particular, interview participants described the role of the FP as involving greater management and supervisory responsibilities and this may result in smaller average daily patient loads. Similarly, medical officers and unspecialised generalist doctors, as more junior members of the clinical team, may be responsible for seeing more patients and this may be reflected in the average daily patients and out of hours commitment for those samples with a higher proportion of more junior, unspecialised doctors.

9.4 Burnout

9.4.1 Prevalence of burnout

The prevalence of burnout was very high across all the samples. Over three-quarters of the total sample (77.4%; 95%CI 73.4-81.1) scored above the subscale thresholds on both the exhaustion and the disengagement subscales. The prevalence of burnout in individual

country samples was also very high, ranging from just under 75% of generalist doctors/FPs in the sample from Malaysia to almost 85% in the sample from Zambia. These are worrying statistics as burnout has far reaching consequences that impact at both the individual and the societal level. Interestingly, Zambia, the country with the highest prevalence of burnout, also has the lowest number of doctors per 10,000 population and the highest DALYs per 100,000 of the five countries and Malaysia, which has the lowest prevalence of burnout of the five countries, has the highest number of doctors per 10,000 population and the second lowest DALYs per 100,000 (see previous section). Of note, wider workforce shortages, described in terms of doctors per head of population, have been shown to independently predict burnout (Picquendar et al., 2019). However, target country sample sizes were not achieved for three out of the five countries (South Africa, Sri Lanka, and Zambia) therefore, the results may not reflect the true prevalence of burnout in FPs in these countries and must be interpreted with caution. In addition, bias such as selection bias due to the sampling method (convenience sampling with snowballing) may impact on the results. For example, those with a particular interest in burnout may be more likely to participate, or conversely, those who are very burnt out may not have the time or energy to be involved with research. This will result in either over or under estimations of the true prevalence and highlights the need for further, larger studies especially in the countries with small sample sizes. Further studies should aim to achieve larger sample sizes and to use a probability sampling method, such as simple random sampling or stratified sampling. This would reduce the risk of bias, generating more widely generalisable results. In addition, it would allow the determination of sampling error and precision (Stratton, 2021). For a more detailed discussion of bias see section 9.8.

Direct comparisons with other studies are difficult when different burnout measurement tools, and definitions of burnout, are used. However, a recent study among FPs in the USA,

using two single-item measures for burnout (exhaustion and depersonalisation) found that 69.2% of participants reported at least one manifestation of burnout (Ofei-Dodoo et al., 2022). Additionally, a second, broader study among physicians in the USA, also measuring just exhaustion and depersonalisation and conducted during the COVID-19 pandemic, found that 62.8% of physicians had high levels of at least one of these dimensions (Shanafelt et al., 2022). Furthermore, a recent physician study in Greece, using the OLBI, estimated a burnout prevalence of 63.2% (Karlafti et al., 2022), and a UK study of FPs, using a single-item burnout measure, and collecting data at the end of 2020, found a burnout prevalence of 35.5% (Biddle et al., 2023). These HIC estimates for the prevalence of burnout in FPs or physicians from the USA and Europe, are all lower than the estimates from this study, possibly reflecting differences in work demands, and the availability of work resources in these settings.

However, a study among FPs in Singapore, using the OLBI and the same definition of burnout as used in this PhD, estimated a similar burnout prevalence of 82.1%, with mean item subscale scores of 2.71 for disengagement and 2.57 for exhaustion (Lum et al., 2021). This is interesting as, although the prevalence of burnout is similar to the findings of this study, the mean score for the disengagement subscale is higher (2.71 vs 2.473 for combined sample) and the mean score for exhaustion is lower (2.57 vs 2.662 for combined sample). This suggests differences in the way burnout manifests, and accords with systematic review findings that, in contrast to findings from HICs, depersonalisation may be less prevalent than exhaustion in FPs in LMICs (Wright et al., 2022).

A meta-analysis of pre-pandemic LMIC studies using the MBI and conducted as part of this PhD, estimated a pooled prevalence of 53.2% for moderate to high levels of EE and 45.4% for moderate to high levels of DP (Wright et al., 2022). Although, the burnout measurement tool used is different in the meta-analysis, the prevalence of burnout is much lower than that found by the subsequent mixed-methods study. This may be partly due to the timing of the

included studies in relation to the COVID-19 pandemic (pre-pandemic), suggesting that the pandemic has negatively impacted burnout prevalence. Additional factors influencing the differences in prevalence estimates between the meta-analysis and this subsequent study may include differences in working environment, workforce numbers, health system, and culture between the countries included in the meta-analysis and the countries included in the subsequent study. Furthermore, selection bias and response bias may have impacted the results of this study leading to over-estimations of burnout prevalence (see section 9.8 for more detail).

More recent evidence from LMICs, using the OLBI, but not limited to FPs, has found similarly high burnout prevalence among physicians. A South African study during the COVID-19 pandemic found a physician burnout prevalence of 78.08% (Khan et al., 2024), and a Nigerian study estimated a prevalence of burnout in physicians of 75.5%, with mean item subscale scores for disengagement of 2.4 (SD 0.4) and exhaustion of 2.7 (SD 0.4) (Nwosu et al., 2020). However, in contrast to these findings, studies conducted during the COVID-19 pandemic in Brazil (primary healthcare personnel), and India (physicians), using the OLBI and defining burnout as a high score on both subscales, estimated much lower burnout prevalences of 44.6% and 54.3% respectively (Izaías et al., 2023; Srikrishna et al., 2020). Using mean scores rather than percentages, a study from China, on rural village physicians, estimated a mean OLBI score of 38.09 (SD 4.55; range 25-47) (Zhu et al., 2023). This is slightly lower than the mean OLBI score for the combined sample in this study (41.08; SD 6.33; range 23-62), but almost identical to the mean OLBI score for the Sri Lanka sample (38.02; SD 4.99; range 24-48). Another Nigerian study looking at burnout in early career doctors found a mean OLBI score of 39.93 (SD 6.67) for their registrars and slightly lower, 37.43 (SD 5.59) for their senior registrars (Ubom et al., 2023), again both slightly lower than the mean OLBI scores in this study. Clearly, recent pandemic and post-pandemic estimates for burnout prevalence are

very high. Despite variation between countries as well as between economic regions, the results of this study are broadly in line with higher estimates from both HICs and LMICs.

9.4.2 Living with burnout

9.4.2.1 Recognition of burnout and the stigma attached to acknowledging burnout

Alongside assessment of burnout using the OLBI, participants were also asked whether they ever felt stressed at work and these answers were compared with burnout scores to evaluate participants' recognition of stress and burnout. A minority of participants (13.1%) answered 'no' to this question indicating that they did not ever feel stressed at work. However, almost three-quarters of those who answered negatively, had high scores on one or both OLBI subscales. In addition to this quantitative data, there was qualitative data from several interviewees, who, despite currently high burnout scores, expressed the belief that while they had experienced burnout during the pandemic, they were recovered now. Moreover, one potential interviewee declined an interview after learning that one of the criteria was to have high burnout scores – he felt he was at low risk of burnout despite the fact that he had high scores on the OLBI.

These findings raise several possibilities: firstly, that some FPs may have difficulty recognising high levels of stress/burnout; secondly, that FPs may perceive moderate to high levels of stress/burnout as normal; and thirdly, that FPs may be reluctant to admit to experiencing stress/burnout. The idea that health practitioners may have difficulty recognising their own symptoms of mental illness, stress, or burnout is not new and is in line with previous studies (Ledingham et al., 2019; Putnik et al., 2011). Added to the difficulty of recognising one's own symptoms of stress and burnout, is the culture within medicine that values stoicism, confidence, competence, and endurance, and normalises exhaustion, stress, and excessive

workloads (Dominic et al., 2021; McQueen et al., 2022; Riley et al., 2021b; Ryan et al., 2023; Sarkar and Cassel, 2021). This stoic medical culture may contribute to both a tendency to normalise stress and burnout and a reluctance to acknowledge the symptoms of stress. However, this culture of stoic endurance also increases the risk of burnout and may inadvertently contribute towards undermining efforts for system change. If physicians, who as an occupational group are highly resilient (West et al., 2020), continue to work increasingly hard to 'plug the gaps' in the system, and overcome shortcomings, health leaders will be less likely to take the necessary, but difficult, steps to adequately resource broken and dysfunctional systems (Sarkar and Cassel, 2021).

Furthermore, globally, there is widespread stigma surrounding mental illness (Gronholm et al., 2023; Kudva et al., 2020; Lauber and Rössler, 2007; Mackenzie et al., 2014) and this spills over into the medical profession and includes stigma surrounding burnout and the acknowledgment of both burnout and work-related stress (Favre et al., 2023; Feist et al., 2020; Malik et al., 2023; Ng et al., 2024). Participants in the qualitative strand of this study identified stigma and expressed concerns that colleagues would perceive them as weak or lazy if they acknowledged burnout or sought help for it, or for the stress that leads to it. They also expressed concerns that admitting burnout might expose them to additional performance related scrutiny or be 'used against them' in some way. These are not isolated concerns. Weiss and colleagues (2021) found that a majority of the paediatric fellows in their study would be reluctant to disclose a history of mental illness for fear it would negatively affect their career progression. Furthermore, within medical culture mental health is often equated with competence (Favre et al., 2023), and "performance is valued above wellness" (Walsh et al., 2019, p.6). For many physicians, embarrassment, shame, and a fear of judgement or discrimination, are associated with a diagnosis of mental illness or

acknowledgement of burnout (Alwatban et al., 2024; Clough et al., 2019; Feist et al., 2020; Gold et al., 2016; Lenoir et al., 2021; Riley et al., 2018a; Walsh et al., 2019).

Stigma acts as a barrier for help-seeking behaviour among physicians which may result in delayed diagnosis and/or treatment (Brower, 2021; Favre et al., 2023; Lenoir et al., 2021). Of note, evidence, largely from HICs, suggests that those with higher levels of burnout perceive greater burnout-related stigma, meaning that those with the greatest need of help and support may be least likely to seek it (Favre et al., 2023; Weiss et al., 2021). Thus, it is vital for health organisations to work towards reducing the stigma associated with burnout, creating a culture that encourages help-seeking behaviour, and providing the necessary confidential support and treatment for those physicians that require it (Cho and Huang, 2020).

9.4.2.2 Consequences of workplace stress and burnout

Qualitative findings indicating that stress and burnout have negative consequences for the physical and mental health of FPs; for their wider family, social, and work relationships; and for their performance; are in line with well described consequences of burnout in the literature (Hodkinson et al., 2022; McCammon et al., 2024; Salvagioni et al., 2017; Suñer-Soler et al., 2014; Tawfik et al., 2019). Furthermore, increased turnover, usually assessed using turnover intention as a proxy, is an important consequence of burnout, especially in LMICs. It is costly (Han et al., 2019; Shanafelt et al., 2017) and has implications for the wider workforce as it impacts on retention of staff and may lead to increased migration (Anduaga-Beramendi et al., 2019). In this study turnover intention was found to be significantly associated with burnout. This was consistent with the qualitative findings and is supported by the wider literature (Hamidi et al., 2018; Hodkinson et al., 2022; Wang et al., 2020; Willard-Grace et al., 2019). These consequences are important especially in countries with

high burdens of disease and significant workforce shortages. Not only do they impact on the recruitment and retention of FPs, but days lost to sick leave absence exacerbate already high levels of understaffing, and there will be economic losses associated with ill-health and high turnover/migration, for these lower income countries that are least equipped to withstand them. In addition, the negative impact of stress and burnout on family, social, and professional relationships, isolates physicians, reducing the protective effect of support. This has implications for physician support networks, with the potential to become a spiral where stress and burnout negatively impact support networks, reducing levels of support, which in turn exacerbate stress and burnout.

9.4.2.3 Coping strategies

Coping has been defined as “constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus and Folkman, 1984, p.141) and strategies are commonly categorised as either problem-focused coping strategies (PFCS) or emotion-focused coping strategies (EFCS). PFCS refer to those strategies that focus on problem solving, identifying the source of stress, and attempting to change it; while EFCS focus on reducing the emotional distress caused by stressors (Folkman and Lazarus, 1980; Lazarus and Folkman, 1984). While PFCS are often described as adaptive and EFCS as maladaptive, evidence suggests that EFCS can also be effective strategies, reducing stress and yielding positive outcomes (Demerouti, 2015; Glazer and Liu, 2017; Maresca et al., 2022; Shah et al., 2017; Shin et al., 2014). This is particularly so in collectivist cultures (Bhagat et al., 2010). In this study coping strategies were explored both quantitatively and qualitatively. Questionnaire participants were asked whether they utilised any of four specific coping

strategies: exercise; voluntary work; hobbies; or socialising with friends and family. In addition, the questionnaire included questions asking participants to rate on a Likert scale the importance of manager, colleague, and family support when coping with work stress. Interviewees were also asked about their coping strategies and while most spoke about the coping strategies referenced in the questionnaire, numerous other coping strategies were also described, both EFCS and PFCS.

Exercise, an EFCS, had a statistically significant relationship with burnout. This was consistent with the qualitative data as several interviewees described how they used exercise or physical activity to reduce stress levels and is supported by findings in the wider literature that exercise is negatively associated with burnout (Doolittle, 2021), and that physical well-being mitigates stress, and the consequences of stress (Demerouti, 2015; Maresca et al., 2022). Additionally, the importance of support (manager, colleague, and family) for coping with work stress, also an EFCS, had a statistically significant association with burnout, and again this was echoed in the qualitative findings, and is consistent with the wider literature (Meredith et al., 2022; Velando-Soriano et al., 2020; Yang et al., 2023). Notably, while seeking support is an important coping strategy, provision of support is an essential work resource and will be discussed in more depth in section 9.5.3 as an associated work factor. EFCSs dominated our findings on coping strategies, with a wide range, both adaptive and maladaptive, described. Adaptive strategies included spiritual practices, such as prayer and meditation; seeking support both socially and from professional networks; and activities promoting rest and relaxation, such as hobbies and taking breaks. Maladaptive strategies included consumption of alcohol and social withdrawal. PFCS were also discussed. These included engaging in career development activities such as pursuing a postgraduate degree, or research; setting boundaries; changing job; or delegating tasks and responsibilities. These coping strategies, along with the predominance of EFCSs in these collectivist cultures, are

broadly in line with the wider literature (Bhagat et al., 2010; Demerouti, 2015; Maresca et al., 2022; McCain et al., 2018; Shin et al., 2014) and contribute important insights, useful for the development of appropriate interventions. Of note, EFCS are often employed when individuals believe that stressors cannot be removed or reduced (Folkman and Lazarus, 1980; Glazer and Liu, 2017). This may explain in part the preponderance of EFCS in our data as many of the stressors identified by participants, such as workload, both volume and complexity; understaffing; patient factors such as traditional health beliefs; conflict; and wider systemic stressors, may not have easy solutions.

9.5 Factors associated with burnout

9.5.1 Demographic factors

There is conflicting evidence within the wider burnout literature for an association between burnout and gender with some studies finding a significantly higher prevalence in women (Çevik and Ungan, 2021; Putnik and Houkes, 2011), and others a significantly higher prevalence in men (Li et al., 2019; Mao et al., 2020; Soler et al., 2008). Still others, like this study, have found no significant association between gender and burnout (Gan et al., 2019; Kotb et al., 2014). The true picture may be complex (Beauregard et al., 2018). Findings from this study revealed gender differences in the factors significantly associated with burnout and this may contribute to the gender differences in prevalence where there are differences in working environment, work characteristics, and the availability of support. In addition, Purvanova and Muros (2010) suggest that women and men experience burnout differently with EE being more common in women. Thus, burnout tools that measure exhaustion as the core dimension of burnout may overestimate the prevalence in women. In addition, cultural differences in gender roles (Putnik and Houkes, 2011) and gender differences in coping

strategies and the importance of protective factors (Brown et al., 2003) may contribute to conflicting findings between countries.

Associations of burnout with age are also inconsistent in the wider literature (Meredith et al., 2022). The finding from this study, that age group is significantly associated with burnout and that the prevalence of burnout is higher in younger age groups, and lower in the over 50 years age group, is supported by studies suggesting that early career, younger age groups are at higher risk of burnout (De la Fuente-Solana et al., 2019; Doolittle, 2021; Dyrbye et al., 2013; Lo et al., 2018b). Reasons for this are likely multifactorial, a combination of family responsibilities, work inexperience leading to feelings of inefficacy, and survival bias where those who are at high risk of burnout leave the profession earlier in their careers (Cherniss, 1993; Dyrbye et al., 2013; Maslach et al., 2001). However, overall, there is a lack of consensus in the literature regarding the association of age group with burnout. Some studies have found the reverse, that the older age group has a higher risk of burnout (Amiri et al., 2016; Bijari and Abassi, 2016), and others suggest that the prevalence of burnout is bimodal with regard to age, peaking in the <25 age group and in the >55 age group (Chemali et al., 2019; Marchand et al., 2018).

Finally, there is no strong evidence in the literature for an association of other demographic factors such as marital status, having children, living with other dependents, and educational level, with burnout, as study results are inconsistent (Cañadas-De la Fuente et al., 2018; Membrive-Jiménez et al., 2020; Meredith et al., 2022). Our findings, that these demographic factors were not significantly associated with burnout, concur with the general lack of evidence for an association in the wider literature.

9.5.2 Anxiety and Depression

Within the wider debate around whether burnout as a construct is distinct from depression, anxiety, and/or CFS (detailed in Chapter 3 section 3.1.2) is an acknowledgement of a relationship, or overlap, between burnout and depression, and/or anxiety (Golonka et al., 2019; Hakanen and Schaufeli, 2012; Shirom and Ezrachi, 2003). This accords with the findings of this study, that a past medical history of, or treatment for, anxiety and depression were significantly associated with burnout. However, our finding was based on self-reported data rather than on medical record data or measurements of depression and/or anxiety, and an in-depth investigation of the relationship between burnout and depression and/or anxiety was beyond the scope of this PhD. Thus, there is a need for further studies, including longitudinal studies, which include measurement tools for both of these related conditions, to enable a deeper exploration of their relationship with burnout in FPs in LMICs. The question of whether the fatigue associated with burnout is different from that associated with depression and chronic fatigue syndromes also warrants further exploration. The commonality of fatigue is a major argument for burnout being an atypical presentation of depression rather than a distinct construct. However, it is possible that the fatigue associated with burnout represents a proportionate physiological response to exceedingly heavy and emotionally taxing workloads, in contrast to the fatigue associated with depression and chronic fatigue which may be largely disproportionate to both mental and physical exertion. In addition, the question of whether recovery trajectories differ between these related syndromes warrants further investigation.

9.5.3 Work-related factors

The four work-related variables of heavy workloads; long hours; work/family conflict; and scarce resources, have long established associations with burnout (Carod-Artal and Vázquez-Cabrera, 2013; Freudenberger, 1974, 1975; Leiter, 2015; Leiter and Maslach, 2003; Rachiotis et al., 2014; Raviola, 2015; Terry and Woo, 2021). Of these, long hours (weekly work hours >50), the impact of long hours on family life (“My work and home responsibilities do not conflict”), and scarce resources (“The resources I need to carry out my duties are not always available”) were found by this study to be significantly associated with burnout. These quantitative findings were supported by the qualitative findings as participants discussed the stress of working long, often antisocial hours; the impact this has both on time available for rest and recovery and on family responsibilities; and the difficulties of working with scarce resources. Furthermore, in line with the wider literature (Friedberg et al., 2014; Molinaro et al., 2024; Raviola, 2015; Raviola et al., 2002; Walden, 2016; Wendland, 2010), interviewees discussed the impact of scarce resources on their ability to provide adequate patient care and described the resulting moral distress of being unable to provide high quality patient care because of a lack of essential supplies, or services. In addition, the lack of specialist services throws this specialist work back onto generalist doctors and FPs, and adds the stress associated with clinical decision making in these complex cases to the stress of difficulties providing high quality care.

Workload, as distinct from long work hours, was measured in this study by focusing on two aspects of work volume: average daily patient numbers and additional duties, neither of which were significantly associated with burnout. Yet, workload is much more complex and nuanced than simply work volume, encompassing factors such as task complexity, degree of responsibility, and time pressure (Leiter, 2015). Thus, this more simplistic quantitative

measurement of workload, together with differences in whether aspects of workload are perceived as challenges or hindrances (see Chapter 3, section 3.2.4), may account for the lack of association of patient load and additional duties with burnout in the quantitative findings. Moreover, measured in isolation these factors may not be associated with burnout, rather it may be the combined impact of patient load and additional duties, together with the nature and complexity of clinical work, that leads to work stress and burnout. However, the qualitative findings, in line with other recent qualitative findings (McCammon et al., 2024), strongly supported workload, in all its complexity, as a significant stressor. Participants discussed the stress of high patient volumes, and the encroachment of their additional duties, especially administrative responsibilities, on their personal time. They described the emotional toll taken by the nature of certain clinical cases, the complexity of clinical decision making, and the anxiety that time pressure will lead to errors. In addition, some, working as sole practitioners, discussed the difficulties of making decisions in isolation without the support, or feedback, of a wider clinical team. This is in line with the wider literature that finds complex and heavy workloads to be associated with burnout (Carod-Artal and Vázquez-Cabrera, 2013; Leiter, 2015; Leiter and Maslach, 2003; McCammon et al., 2024; Raviola, 2015; Riley et al., 2018b).

Workplace conflict was also found to be significantly associated with burnout. This was consistent with the qualitative findings where participants discussed the stress of conflict between both colleagues and patients and the idea that while conflict led to increased stress, stress conversely led to further conflict. This is in line with the wider literature that finds interpersonal conflict to be associated with workplace stress and burnout (Danauskė et al., 2023; Fraboni et al., 2023; Gan et al., 2019; Hu et al., 2015; Mandengue et al., 2017; Meier et al., 2015; Riley et al., 2018b; Sibeoni et al., 2021). Of note, conflict with work colleagues, while stressful in its own right, also impacts negatively on the resource of workplace support.

Workplace support, including supervisor/manager support as well as colleague support, was found to be significantly associated with burnout in accordance with the wider literature that describes workplace support as an essential work resource (Lo et al., 2018b; Meredith et al., 2022; Riley et al., 2021a; Velando-Soriano et al., 2020), and the lack of support, as well as interpersonal conflict at work, as important sources of psychological distress (Riley et al., 2021b). The association of both conflict and support with burnout underlines the importance of positive interpersonal relationships in preventing burnout and in coping with the impact of stress.

A specific interpersonal relationship, the doctor-patient relationship, lies at the heart of the practice of medicine. In fact, this relationship, and the potential to positively impact patient suffering, were motivating factors for many of those who participated in this study. Yet many also discussed the stress of conflict with patients, together with other patient factors that may negatively impact this relationship, such as communication difficulties. Messinger and Das (2023) discuss the doctor-patient relationship from a philosophical viewpoint, positing that the breakdown of the doctor-patient relationship leads to a loss of meaning in work for the physician and this loss of meaning in turn leads to burnout. This idea accords with Pines (1993) argument that the failure to find meaning in one's work leads to burnout (outlined in Chapter 3, section 3.2.1), and may explain, in part, the significant association of workplace conflict with burnout in our results, where conflict occurs with patients. In addition, several patient factors such as communication difficulties, patient compliance, patient expectations, and patient health beliefs, were discussed in the qualitative data. These may provoke conflict and act as stressors through their negative impact on the doctor-patient relationship.

Several other work characteristics were found to be significantly associated with burnout, supported by the qualitative findings. These were autonomy i.e., the freedom to influence

work-related decisions, having a clearly defined role, opportunities for professional development and training activities, feeling safe at work, and fair treatment in the workplace, all of which are in line with the wider literature (Jackson et al., 2024; Leiter, 2015; Leiter and Maslach, 2003; Park et al., 2014). Work-related travel was also identified as a significant stressor in both the quantitative and the qualitative findings and is a novel finding. There are three main ways in which this operates as a stressor, as described in the qualitative data (Chapter 7, section 7.3.4). The first is in terms of travel time and the increased length of the working day, the second is in terms of driving conditions such as road safety, and the third is where a mandatory work posting requires complete relocation. There is little in the wider burnout literature regarding the impact of work-related travel on stress levels. However, a study in Europe found that increased commuting time was negatively associated with well-being (Zijlstra and Verhetsel, 2021), and studies in Ghana and Cameroon, on nursing students and physicians respectively, also found a correlation between long commutes and work stress (Mandengue et al., 2017; Osei et al., 2022). The third way in which work-related travel operates as a stressor, relocation for mandatory postings to more remote areas, detaches FPs from their usual support networks, effectively removing an important resource, and a potential coping strategy. This suggests a possible mechanism for the impact of this particular aspect of work-related travel on stress levels.

Finally, reward (both non-monetary and monetary) emerged as an important resource, with participants discussing the importance of non-monetary rewards such as respect, and social standing. In addition, responses from both the interviews, and the questionnaire, highlighted the importance of appropriate monetary rewards. 'Better pay' was the most popular response (out of nine possible options) to the question 'What single change at work would make the biggest difference' and a frequent response to the open question 'What are some possible solutions to workplace stress in your country?'. Moreover, 'inadequate salary' was a

common response to the open question: 'What other aspects of your work do you find especially stressful?'. This finding is in line with the wider literature that finds reward, both non-monetary and monetary, to be an important work resource mitigating job demands (Jimenez and Dunkl, 2017; Leiter, 2015; Leiter and Maslach, 2003).

9.8 Strengths and limitations

9.8.1 Strengths of the study

This study has several strengths. To my knowledge, it is the first study of burnout in FPs for four out of the five included countries (Pakistan, Malaysia, Sri Lanka, and Zambia), and while the fifth country, South Africa, has previous data on burnout in FPs (collected in 2010) it was limited in setting to the Cape Town Metropolitan Municipality. Moreover, this is the first study of burnout in FPs for all five countries since the COVID-19 pandemic, and the first that combines and compares data from several LMICs. In addition, the involvement of local collaborators ensured that the study tools were culturally appropriate and combining quantitative and qualitative data in a mixed-methods design added richness and breadth to the findings. Furthermore, a validated burnout measurement tool, and a robust definition of burnout were used. Although, the individual country sample sizes for the questionnaire were below the target country sample size for three of the five countries, the overall sample size exceeded the target sample size, thus providing a reliable estimate for burnout prevalence for the combined sample. Furthermore, the online mode extended the geographical reach of the study, allowing us to sample from all five countries efficiently and cost-effectively.

9.8.2 Limitations of the study

However, there are several limitations. As a cross-sectional study this data only captures a moment in time and therefore, cannot provide insights into trends or longitudinal developments of burnout. In addition, due to varying delays with completing the administrative requirements in each country prior to data collection, data were not collected concurrently. Furthermore, the sampling method, and sample sizes are also limitations. Convenience sampling is a non-probability method meaning that the sample was a non-random sample and therefore, the results are likely to be less generalisable beyond the study sample. Moreover, sample size calculations for individual countries were limited as there was no adjustment for differences in FP populations between countries, and three out of the five included countries did not achieve their target sample size. This will impact on the statistical power and precision of the study and increase the possibility of Type 2 errors.

Bias is also a limitation of the study. The use of convenience sampling with snowballing, and the utilisation of a survey method for quantitative data collection may have increased the risk of bias. Convenience sampling does not afford every member of the target population an equal opportunity for participation, increasing the risk of selection bias and limiting the external validity of the study and the generalisability of the results (Sedgwick, 2015; Stratton, 2021). Selection bias occurs when the sample characteristics differ systematically from the target population (Bowling, 2014; Sedgwick, 2015) and may occur when participants self-select for participation or are referred to the researcher. Participants who self-select often have particular motivations for doing so (Stratton, 2021). In this study these might include a particular interest in burnout, personal experience of work-related stress and burnout, or a wish to express strongly held opinions around work-related stress and burnout, resulting in an over-estimation of the prevalence of burnout and the strength of its associations.

However, self-selection may also result in an under-estimation of the prevalence of burnout as those with excessively demanding workloads do not have the energy or time to participate in research. Furthermore, this study was not able to compare the characteristics of those who responded to the invitation to participate and those who did not. Therefore, it is possible that non-response bias, where the characteristics of non-responders differ from the characteristics of responders, may have impacted the results (Bowling, 2014). However, every effort was made to reach as many FPs as possible and provide them with the opportunity to participate. This was done using several different platforms, including email, professional social media sites, and conferences.

In addition to the sampling method chosen, the use of a questionnaire for data collection may introduce forms of bias, such as measurement bias and response bias, which affect the internal validity of the results. These biases occur when questionnaires, and questionnaire items are poorly designed leading to inaccurate responses (Bowling, 2014). Considerable work was done to ensure a well-designed questionnaire and attention was paid to both the order of sections within the questionnaire and the wording and construction of the questionnaire items in an attempt to minimise bias. The questionnaire was also piloted with the international collaborators to identify and resolve any cultural or wording issues.

The total sample for the questionnaire was not divided evenly between countries with the largest proportion coming from Malaysia ($n=163$) and the smallest proportion from Zambia ($n=45$). As a result, our quantitative results for the combined sample may be skewed towards the Malaysian data. Additionally, the chi-squared test for independence is limited as it can only provide information on whether two categorical variables have a statistically significant relationship and cannot provide information on the strength of that association. It also assumes random sampling and is sensitive to sample size. Therefore, it was not possible to

conduct chi-squared analysis for each variable in the individual datasets as sample sizes did not permit and results must be interpreted with caution as sampling was not random. The online mode of the study, while having advantages, introduces some limitations such as the possibility that concerns over online data security, and the perceived impersonal nature of online interactions, may have negatively impacted the response rate. Moreover, the online mode may further introduce bias as only those with internet access can participate. Other factors potentially impacting recruitment were the lack of incentives/reimbursement for data costs and the language limitations of the study. Despite English being the language of higher education in these countries, particularly for science and medicine (see section 5.6.4), some participants may not have felt comfortable participating in a study using their second or third language. Finally, the impact of differences in health systems between countries was not measured. However, countries were treated as clusters in the Poisson regression analysis to account for systemic differences and the impact of differences in health systems also emerges in the qualitative data.

Finally, the study is limited by the lack of Patient and Public Involvement and Engagement (PPIE) activities or the involvement of a Healthcare Professional (HCP) Advisory Group. PPIE is the involvement of members of the public who may be affected by the research or who have lived experience of the condition that is being researched so that the research is done 'with them' rather than 'on them' (Kaisler and Missbach, 2020). This empowers them, democratising knowledge and leading to more socially relevant research with greater impact (Kaisler and Missbach, 2020; Rahman et al., 2022). This study would have benefitted from the involvement of a PPIE or advisory group at every level, from decisions around the design of the study, what would work best, what would be culturally and contextually feasible and appropriate, through to the design and delivery of the questionnaire and the interview topic guide, to the interpretation of the findings and finally to the recommendations for

interventions and dissemination of findings. PPIE involvement would have focused both questionnaire and topic guide on the aspects of work-related stress and burnout that were felt to be the most important and socially relevant by those who had experience of burnout. Additionally, having a PPIE group to advise on the best way to deliver the questionnaire might also have improved participant recruitment. PPIE is also important for the interpretation of the findings of research, and for this study, with its broad geographical involvement, PPIE would have been invaluable for focusing recommendations on what is culturally and contextually feasible in each country. Although collaborators from each country contributed to the design and delivery of the questionnaire and will be involved in the dissemination of the results, they took part as FP researchers, with a research perspective, rather than as patients, with lived experience of burnout, or members of the public, with a broader public viewpoint.

9.9 Implications of findings and possible solutions

The extremely high prevalence of burnout, found across five LMICs, has profound implications for the individual FPs in these countries and for each country's workforce and health system. In terms of possible solutions, it is likely that the most effective interventions are combinations of the individual and the organisational approach (Karlson et al., 2014; Pijpker et al., 2019; Riall et al., 2018). Findings from this study identify a range of factors associated with burnout that could be targeted in the development of interventions. These are discussed further in the following sections.

9.9.1 Policy

The importance of work environments, where physicians have manageable workloads and the necessary essential resources to provide high quality care, where they are respected, adequately remunerated, well supported, treated fairly, feel safe, and have a good work-life balance, has been confirmed by the findings of this study. This has implications for health organisations and policymakers as they strive to improve working conditions for their health workforce and develop appropriate policies and interventions to prevent burnout or mitigate its impact. As an occupational group, physicians are highly resilient and may continue to function reasonably well despite high levels of burnout (West et al., 2020). However, this should not encourage complacency regarding the need for change. It is noteworthy that other safety critical industries, such as the airline industry, have successfully introduced regulations around workload and rest/recovery time (Caldwell et al., 2019; Greig and Snow, 2017), and acknowledge the negative impact of fatigue on health and well-being as well as on memory, decision making, and the ability to carry out complex tasks (Caldwell et al., 2019).

At the heart of creating appropriately resourced, supportive, and safe work environments is funding. The funding of health services is a huge, overarching, political policy issue (Hanson et al., 2022) that impacts on many of the factors associated with burnout. Adequate funding is necessary to meet staffing requirements, remunerate staff appropriately, and fund the provision of essential supplies and services. Adequate staffing has knock-on effects for several other associated factors including patient load, work hours, access to CPD, and the ability to take adequate breaks/annual leave for rest and recovery. In resource poor settings it may be impossible to increase overall health funding, however, appropriate prioritisation of funding is also crucial (Hanson et al., 2022). FP participants from each of the included

countries spoke about the inadequacy of funding for government sector services, and several of the FPs interviewed, from Malaysia, South Africa, and Zambia, expressed the belief that secondary care funding is prioritised over primary care funding in their country, leaving primary care underfunded. This perspective is supported by the wider literature (Ahmed et al., 2024; Goodwin et al., 2011; Hanson et al., 2022; Zhang et al., 2017) and raises questions over whether funding priorities need to be reassessed in some LMICs, to achieve UHC.

Other suggested areas for policy change, such as the particular work-related travel associated with mandatory postings to more remote areas, specific to participants from Pakistan, Malaysia, and Zambia; and regulatory and systemic changes (such as the regulation of prescription medication), discussed mainly by participants from Pakistan and Sri Lanka, require awareness and commitment to change at the government level, and may be resource intensive and difficult to implement.

9.9.2 Practice

Burnout has consequences, both for physician health and physician relationships, which may result in increased sick leave absences, high turnover and migration, and difficulties recruiting and retaining FPs. In countries that already have workforce shortages and where three-quarters or more of FPs are affected by burnout, this will have a significant impact on the primary care workforce, their ability to provide high quality, safe, patient care, and the achievement of UHC. Support is a vital resource for preventing and mitigating burnout.

Interventions to improve levels of professional support for FPs by developing more formal pathways of support such as access to mentoring and/or coaching programmes (Kiser et al., 2024), and the provision of psychological support services such as counselling, and/or helplines, were suggested by participants from Pakistan, Malaysia, South Africa, and Zambia.

These could be combined with more informal pathways of support, many of which already exist, such as involvement in professional social media groups (all countries), encouraging teams to engage in team building activities (Zambia), and providing opportunities for debriefing and constructive feedback with trusted colleagues (all countries). While this type of intervention would require the input of some additional resources and manpower, it might be possible in some settings to re-deploy existing services.

Participants from all the included countries also discussed the importance of work-life balance in preventing burnout and the need for appropriate opportunities for rest and recovery. This may include a need to reduce expected work hours and/ or include recovery time in work schedules. Where FPs struggle to take annual leave, most notably discussed by participants from Zambia, organisations should consider developing policies to encourage FPs to take appropriate leave. However, these changes would also have staffing implications, requiring an input of staffing resources that may simply not be feasible in resource poor settings.

9.9.3 Training and education

This high prevalence of burnout also has implications for training and education. Participants from Pakistan, South Africa, and Zambia suggested that using workshops and training to increase awareness of burnout, reduce stigma, and equip individuals with appropriate coping strategies would be a useful intervention. This sort of training could also be incorporated into medical school curricula. Furthermore, the importance of good communication and relationships within teams was discussed by participants from Malaysia, Zambia, Sri Lanka, and South Africa. Therefore, training in communication skills and conflict management may increase FP self-efficacy in this area and contribute towards reductions in workplace conflict.

This would mitigate the impact of workplace conflict as a risk factor. Many participants mentioned positively the increase in online training since the pandemic, and this may be a more feasible and resource appropriate approach to delivering this type of intervention. Another aspect of training and education is the wider provision of CPD activities which acts as an important resource in the JD-R model. This was felt by most participants to be adequate, but time was a barrier to accessing these opportunities. In response, organisations could introduce changes such as protected time for CPD to improve the accessibility of CPD activities, although again, adequate staffing is necessary to ensure cover, and this would require the input of additional resources and manpower that may not be readily available.

9.9.4 Implications of gender, age group, and country differences

Organisations should also be aware of gender differences in the factors associated with burnout and the gender demographic of specific work environments should be considered when developing interventions. Allied to this is our finding that age group and years since completing medical school are significantly associated with burnout, suggesting that burnout is more prevalent in early career, younger age groups. This raises the question of the timing of interventions and the possibility that interventions should be targeted at the early career stage, or even during medical school. More research is required to investigate the optimum timing of interventions for burnout, and whether interventions in medical school or early career could have a long-term impact on the prevalence of burnout in the FP workforce. Finally, differences between countries in factors associated with burnout underlines the need for additional, larger studies in individual LMICs to investigate the prevalence of burnout in FPs and identify the most appropriate and effective ways of mitigating its impact, as these

may vary between countries and cultures. See Appendix L for the chi-squared associated factor analyses for gender and country.

9.9.5 Implications for research

This PhD has highlighted the dearth of evidence for burnout among FPs in LMICs and the need for further research in understudied countries. As sample sizes in this study were not achieved for three out of the five countries, and sampling was non-random, larger studies, utilising random sampling methods, would be necessary in all five countries to make more concrete, generalisable conclusions. There were also some gaps in this research, crucially the lack of exploration of experiences of self-harm and/or suicide, and the lack of investigation of the association of burnout with alcohol and/or drug misuse. These are important areas for future research. In addition, longitudinal studies are needed to examine the development of burnout over time, and its relationship with depression, anxiety, and chronic fatigue. Finally, context specific research to develop, and trial, interventions for burnout is crucial.

9.10 Conclusion

In conclusion, this PhD investigated the prevalence, associated factors, and experience of burnout in FPs in five LMICs and found the prevalence to be extremely high, with around three-quarters of respondents scoring above the thresholds on both the exhaustion and the disengagement subscales of the burnout measurement tool. The factors associated with burnout largely accord with the factors associated with burnout in HICs, although the association of burnout with work-related travel is a more novel finding. In addition, some of the patient factors in LMICs also differ from those that appear in the HIC burnout literature, such as the impact of patient poverty and literacy levels, and there are also differences in

regulatory and systemic factors between countries. These differences underline the importance of conducting burnout research in different settings. Findings around the consequences of burnout accord with findings from HICs with descriptions of burnout, including physical and psychological symptoms, aligning with evidence from HICs. However, although the consequences are similar, these consequences are being felt on the background of an estimated prevalence of burnout of around three-quarters of the FP workforce and may have a more substantial impact in LMICs where resources are scarce, workforce shortages are much greater, and where there is more work to do to achieve UHC. Therefore, it is critical that leaders within government and health organisations in LMICs recognise the impact of burnout on the primary care workforce, especially among their FPs, and work with local health leaders to develop healthcare infrastructure, policies, and interventions to prevent and/or mitigate burnout. It is also critical that health organisations work towards de-stigmatising work-related stress and burnout and provide adequate support for those seeking help. A culture change may be necessary in many organisations. Finally, there is still a dearth of evidence for burnout and its associated factors in LMICs and it is vital that more research is carried out. There is a need for larger cross-sectional studies to confirm the findings of this study. There is also a need for longitudinal studies to look at the development of burnout over time and its relationship with depression, anxiety, and chronic fatigue. In addition, interventions need to be developed and trialled. Although system change might be difficult, the multiplicity of factors associated with burnout raises the possibility that there may be many focused and cost-effective ways of intervening to mitigate the impact of burnout and improve working conditions for FPs in LMICs.

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Appendices

Appendix A: List of LMIC countries with Family Medicine programmes

List of LMICs known to have Family Medicine training programmes or to recognise Family Medicine – data from the Wilfred Laurier University Global Family Medicine website

Global Family Medicine, 2019. Global Family Medicine - Wilfrid Laurier University [WWW Document]. Global Family Medicine - Wilfrid Laurier University. URL <https://globalfamilymedicine.org> (accessed 5.19.22).

Sub-Saharan Africa	Central, East, Southeast, and South Asia	Latin America and Non-Hispanic Caribbean	Oceania and the Middle East	Eastern Europe
Ethiopia Ghana Kenya Madagascar Malawi Mali Nigeria Rwanda South Africa Tanzania Uganda Zambia (<i>only recently developed and not currently showing on the Global Family Medicine website</i>)	Kyrgyzstan Tajikistan Turkmenistan Uzbekistan China Burma Cambodia Indonesia Laos Malaysia Philippines Thailand Vietnam Bangladesh India Pakistan Nepal Sri Lanka	Argentina Bolivia Brazil Chile Colombia Costa Rica Cuba Dominican Republic Ecuador El Salvador Guatemala Honduras Mexico Nicaragua Panama Paraguay Peru Puerto Rico Uruguay Venezuela Guyana Haiti Jamaica St Lucia	Fiji Afghanistan Egypt Iran Iraq Jordan Lebanon Morocco Palestine Sudan Syria Tunisia	Albania Armenia Azerbaijan Belarus Bulgaria Bosnia and Herzegovina Georgia Kosovo Moldova Montenegro Russian Federation Serbia Ukraine

Tanya Wright,^a Faraz Mughal,^a Opeyemi OBabatunde,^a Lisa Dikomitis,^b Christian DMallen^a & Toby Helliwell^a

Conclusion The substantial prevalence of burnout among primary health-care professionals in low- and middle-income countries has implications for patient safety, care quality and workforce planning. Further cross-sectional studies are needed to help identify evidence-based solutions, particularly in Africa and South-East Asia.

Table 1. Definitions of low, moderate and high Maslach Burnout Inventory subscale scores, meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022

Maslach Burnout Inventory subscale	Subscale score, score category		
	Low	Moderate	High
Emotional exhaustion	≤ 16	17–26	≥ 27
Depersonalization	≤ 5	6–9	≥ 10
Personal accomplishment	≤ 33	34–39	≥ 40

databases from database inception to 16 November 2020: (i) MEDLINE®; (ii) CINAHL; (iii) PsycInfo; (iv) APA PsycArticles®; (v) AMED; (vi) Embase®; (vii) Web of Science Core Collection; (viii) Global Index Medicus; and (ix) CNKI. Searches were updated on 11 February 2022. Reference lists were hand searched. [Box 1](https://www.who.int/publications/journals/bulletin/) (available at: <https://www.who.int/publications/journals/bulletin/>) presents the combination of search terms. The full search strategy conducted on MEDLINE® via EBSCOhost (EBSCO Information Services, Ipswich, United States of America, is extensive; details are available from the data repository.¹⁷ There were no search limitations.

Study eligibility criteria are listed in [Box 2](https://www.who.int/publications/journals/bulletin/) (available at: <https://www.who.int/publications/journals/bulletin/>). We included studies in the meta-analysis if the Maslach Burnout Inventory was used as the measurement tool and prevalence estimates were reported for each of the following three subscales:¹⁹ (i) emotional exhaustion; (ii) depersonalization; and (iii) personal accomplishment. Low- and middle-income countries were defined by the World Bank's 2020 income classification.¹⁸ We exported search results to Rayyan Intelligent Systematic Review (Rayyan Systems Inc., Cambridge, USA) for de-duplication and screening. One reviewer completed title screening and a second reviewer independently screened 10% of titles for comparability. Two reviewers independently completed abstract and full text screening; disagreements were resolved through discussion. We developed the protocol for this systematic review and meta-analysis a priori and registered with PROSPERO (CRD420221336).²⁰

Data extracted included: (i) study author; (ii) year of publication; (iii) country; (iv) region; (v) country income classification; (vi) study design; (vii) study participants; (viii) sampling

method; (ix) sample size; (x) participants' mean age; (xi) percentage of female participants; (xii) measurement tool; (xiii) prevalence of overall burnout; and (xiv) prevalence of burnout according to measurement tool subscales and to any associated factors. Two reviewers extracted data independently using a form developed and piloted for the study and at the same time performed a quality assessment using Hoy et al.'s risk-of-bias tool for prevalence studies,²¹ details available from the data repository.¹⁷ Disagreements were resolved through discussion. We translated non-English studies using Google Translate (Google LLC, Mountain View, USA).

Data analysis

Study characteristics, the burnout prevalence range and factors associated with burnout are reported narratively for all eligible studies. A random-effects model was used for the meta-analysis. We performed the analysis with MetaXL v. 5.3 (EpiGear International Pty Ltd) using the double arcsine transformation variant for the meta-analysis of prevalence.²² We calculated pooled prevalence estimates for each score category (i.e. high, moderate and low) in the three Maslach Burnout Inventory subscales and reported with 95% confidence intervals (CIs). Standard values for the subscale score categories are listed in [Table 1](#). Subgroup analyses were carried out for different professional groups. Study heterogeneity was assessed by inspecting forest plots and by calculating I^2 – an I^2 greater than 60% indicated a high degree of heterogeneity. Publication bias was assessed using Doi plots and the LFK index.²³

Results

The literature searches generated a total of 1568 unique articles once duplicates were removed ([Fig. 1](#)). After screening,

we included 60 studies in the narrative review and 31 studies in the meta-analysis.

Study characteristics

The 60 studies in the narrative review included a total of 61 089 primary health-care professionals from 20 low- and middle-income countries. The sample size ranged from 28 to 21 759. There were 61 different country data sets as one study included two countries: Bulgaria and Turkey.²⁴ The greatest number of studies came from Brazil (18 studies),^{25–42} followed by China (10 studies),^{43–52} and Mexico (6 studies).^{53–58} Every WHO region was represented, with the greatest number of studies (25 studies) coming from the Region of the Americas. [Box 3](#) (available at: <https://www.who.int/publications/journals/bulletin/>) summarizes the geographical spread of studies.

According to the World Bank's 2020 income classification, most (54) data sets in this review were from upper-middle-income countries. Five were from lower-middle-income countries;^{59–63} two were from low-income countries.^{64,65} There were 20 non-English language studies: 11 Portuguese;^{26–30,32,33,36,37,39,40} eight Spanish;^{35,38–38,66} and one French.³⁹ All Chinese publications that fulfilled our inclusion criteria were available in English. Overall, 54 studies reported participants according to gender and 31 reported their mean age, which ranged from 28 (standard deviation, SD: 2.59) to 47 (SD: 8.48) years. [Table 2](#) (available at: <https://www.who.int/publications/journals/bulletin/>) lists the different types of health-care worker included in the studies.

The measurement tool used by 47 of the 60 studies was the Maslach Burnout Inventory. In the remaining 13 studies, the tool used was either: the Spanish Burnout Inventory;^{29,36,39} the Compassion Fatigue Questionnaire;⁶⁷ the Professional Quality of Life scale;⁶⁸ the Oldenburg Burnout Inventory;⁴⁰ a short, validated questionnaire based on the Maslach Burnout Inventory;⁶⁶ the Burnout Measure;^{68,69} the Copenhagen Burnout Inventory;⁶³ the Burnout Characterization Scale;⁴² Emotional Burnout Diagnostics by Boyko V.V.;⁷⁰ or a single-item scale.⁶¹ Only three studies reported collecting data during the COVID-19 pandemic: ^{68–70} two were conducted in Turkey and used the Burnout Measure (short version);^{68,69} and one was conducted in the Russian Federation and

used Emotional Burnout Diagnostics.²⁰ One study included family medicine residents,⁶⁸ one nurses,²⁰ and one community pharmacists.⁶⁸ Table 3 summarizes the studies' characteristics.

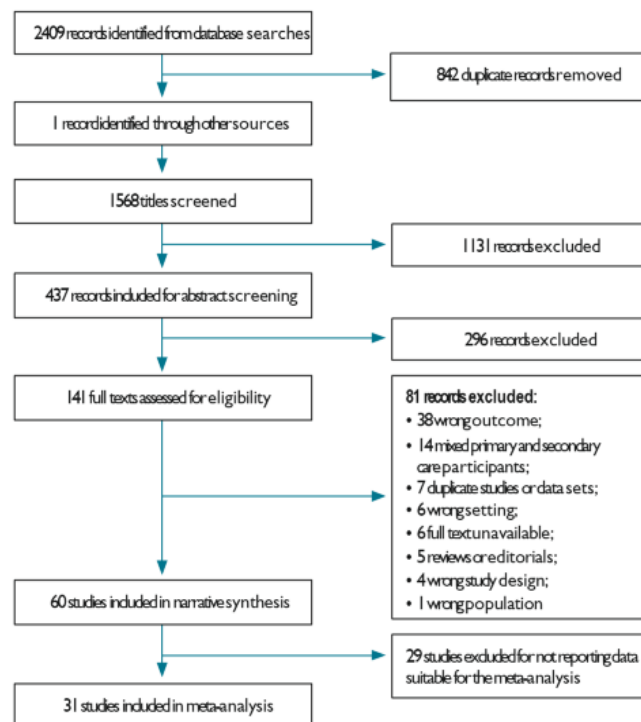
Burnout prevalence

A single-point prevalence for overall burnout was reported by 43 studies, which used a range of different measurement tools and different definitions of burnout. Estimates ranged from 2.5% for severe burnout among family physicians in China to 87.9% for burnout among midwives in Uganda.^{45,65} In the three studies that collected data during the COVID-19 pandemic, the prevalence ranged from 31.5% in community pharmacists to 47.4% in family medicine residents (for severe or very severe burnout) to 50.0% in primary care nurses.^{68–70}

Of 47 studies that reported burnout prevalence determined using the Maslach Burnout Inventory, 31 (involving 14 439 primary health-care professionals) contributed data suitable for the meta-analysis. The risk of bias was assessed as low for 18 of these studies and moderate for 13. No study had a high risk of bias. Of the two studies in the meta-analysis that were published during the pandemic, one collected data before the COVID-19 pandemic and one did not report dates for data collection. Table 4 shows the pooled prevalence of emotional exhaustion, depersonalization and reduced personal accomplishment across the 31 studies. The pooled prevalence was 28.1% for a high level of emotional exhaustion, 27.6% for a moderate level of emotional exhaustion, 16.4% for a high level of depersonalization, 22.7% for a moderate level of depersonalization, 31.9% for a high level of reduced personal accomplishment and 28.1% for a moderate level of reduced personal accomplishment. The combined estimated prevalence of a moderate or high level on each subscale was 55.7% for emotional exhaustion, 39.1% for depersonalization and 60.0% for reduced personal accomplishment. The I^2 for these studies was 98% for the emotional exhaustion subscale and 99% for the depersonalization and personal accomplishment subscales, which indicate a high degree of heterogeneity. Forest plots for high scores on each subscale are available from the data repository.¹⁷

The subgroup analysis showed that high scores for emotional exhaustion were most prevalent in community

Fig. 1. Selection of studies, meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022



nurses (pooled prevalence: 33.1%; 95% CI: 22.7–44.0), followed by family physicians (pooled prevalence: 26.1%; 95% CI: 20.3–32.5) and community health workers (CHWs, pooled prevalence: 21.3%; 95% CI: 9.3–34.8). Depersonalization was also most prevalent among community nurses (pooled prevalence for a high score: 30.0%; 95% CI: 11.3–50.7), followed by family physicians (pooled prevalence: 11.5%; 95% CI: 7.8–16.0) and CHWs (pooled prevalence: 10.0%; 95% CI: 6.3–14.5). In contrast, reduced personal accomplishment was most prevalent in CHWs (pooled prevalence for a high score: 33.5%; 95% CI: 19.2–48.7), followed by nurses (pooled prevalence: 31.3%; 95% CI: 16.1–47.8) and family physicians (pooled prevalence: 28.7%; 95% CI: 19.7–38.4). Forest plots for the prevalence of high scores on the three Maslach Burnout Inventory subscales are presented in Fig. 2, Fig. 3 and Fig. 4.

Factors associated with burnout

Demographic factors, such as sex, age, marital status and educational level, were associated with burnout

in our review. Nine studies found a higher prevalence of burnout in women,^{38,40,57,61,64,68,69,71,82} six found a higher prevalence in men,^{24,27,46,48–50} and three found no significant sex difference.^{45,56,60} Burnout, specifically emotional exhaustion, was negatively associated with age in 10 studies,^{24,27,41,49,50,60,61,69,73,76} whereas four studies found a positive association.^{64,73,81,82} Burnout was positively associated with marriage in four studies,^{40,44,60,63} and with having children in four studies.^{40,57,59,81} In contrast, there was a positive association with unmarried status in eight studies,^{45,49,50,53,54,68,76,83} and with not having children in two.^{29,68} A high educational level was associated with burnout in eight studies.^{44,46,48–50,53,54,81}

A heavy workload (including overtime, shift work and a high patient load) and having a second job were significantly associated with a high prevalence of burnout.^{24,29,37,38,46,48–50,53,56,57,59–61,63,67,78,79,83} as were exposure to violence and conflict at work.^{35,44,45,56,59,74,79} Other work-related factors included working in a rural or economically deprived setting,^{27,38,41,64,67} insufficient resources,^{38,56,79,82} COVID-19

Table 3. Study characteristics, meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022

Study and year	Country	Type of participant	Burnout measurement tool	No. of participants	Mean age of participants, years	Proportion of female participants, %	Overall burnout prevalence, %	Prevalence of burnout by MBI subscale score category, (%) ^a		
								Emotional exhaustion	Depersonalization	Personal accomplishment
Punik 2011 ⁷¹	Serbia	Family physicians	MBI—General Survey MBI—Human	373	47	84	ND	High (48.3); moderate (34.0)	High (12.9); moderate (32.7)	High (5.1); moderate (16.9)
Mandengue 2017 ⁵⁹	Cameroon	Family physicians	Human Services Survey	85	ND	48.2	42.4	High (11.8); moderate (18.8)	High (10.6); moderate (31.8)	High (30.6); moderate (29.4)
López-León 2007 ⁵⁶	Mexico	Family physicians	MBI	131	46.4 (SD: 6.3)	42	39.7	High (26.0); moderate (22.1)	High (19.8); moderate (12.3)	High (8.4); moderate (14.5)
Lesic 2009 ⁷²	Serbia	Family physicians	MBI	38	42.2 (SD: 10.7)	79.0	ND	High (29.0); moderate (45.2)	High (11.1); moderate (27.8)	High (24.2); moderate (27.3)
Kob 2014 ⁶⁰	Egypt	Family physicians	MBI	31	ND	80	41.94	ND	ND	ND
Kosan 2019 ⁷³	Turkey	Family physicians	MBI	385 (139 in 2008 and 246 in 2012)	2008: 30 (SD: 5.13); 2012: 34.05 (SD: 5.78)	64.2 (48.9 in 2008 and 72.8 in 2012)	ND	2008: high (0.7) and moderate (24.5); 2012: high (9.3) and moderate (21.5)	2008: high (4.3) and moderate (18.0); 2012: high (4.5) and moderate (19.9)	2008: high (76.3) and moderate (21.6); 2012: high (79.3) and moderate (17.4)
Gan 2019 ⁴⁵	China	Family physicians	MBI—Human Services Survey	1015	ND	ND	35.0 (high on one MBI subscale); 21.0 (high on two subscales); 2.5 (high on three subscales)	High (24.83); moderate (23.25)	High (6.21); moderate (12.0)	High (33.99); moderate (20.0)
Charoentanyarak 2020 ⁷⁴	Thailand	Family physician residents	MBI—Human Services Survey	149	28.29 (SD: 2.59)	67.1	10.7	High (33.56); moderate (30.87)	High (14.09); moderate (27.52)	High (1.34); moderate (2.68)
Cetina-Tabares 2006 ⁵⁵	Mexico	Family physicians	MBI	93	44	46.2	20.5 (high on three subscales); 29.0 (moderate on three MBI subscales)	ND	ND	ND
Stanetić 2013 ⁷⁵	Bosnia and Herzegovina	Family physicians	MBI—Human Services Survey	239	ND	83.3	ND	High (46.0); moderate (28.9)	High (21.3); moderate (31.8)	High (22.2); moderate (34.7)
Soler 2008 ⁶⁴	Bulgaria and Turkey	Family physicians	MBI—Human Services Survey	69 in Bulgaria and 112 in Turkey	ND	ND	ND	Bulgaria: high (62.3); Turkey: high (15.2)	Bulgaria: high (30.4); Turkey: high (15.2)	Bulgaria: high (18.8); Turkey: high (69.4)
Aranda 2004 ⁴³	Mexico	Family physicians	MBI—Human Services Survey	163	47	36.2	42.3	High (16.0); moderate (16.0)	High (1.8); moderate (5.5)	High (6.7); moderate (8.6)
Aranda-Beltrán 2005 ⁵⁴	Mexico	Family physicians	MBI	197	ND	37.1	41.8	High (13.3); moderate (17.9)	High (2.0); moderate (6.6)	High (6.6); moderate (7.7)
Al Dabbagh 2019 ⁷⁶	Iraq	Family physicians	MBI	134	ND	64.8	30.6 (high); 50.0 (moderate)	High (68.7); moderate (11.9)	High (26.1); moderate (28.4)	High (41.1); moderate (26.1)

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Study and year	Country	Type of participant	Burnout measurement tool	No. of participants	Mean age of participants, years	Proportion of female participants, %	Overall burnout prevalence, %	Prevalence of burnout by MBI subscale score category, (%) ^a		
								Emotional exhaustion	Depersonalization	Personal accomplishment
Ahmadpanah 2015 ⁷⁷	Iran (Islamic Republic of)	Family physicians	MBI	100	32.90 (SD: 5.06)	29	ND	High (15.4)	High (14.5)	High (10.2)
Aguilera 2010 ³⁷	Mexico	Family physicians	MBI-Human Services Survey	233	44.4 (SD: 7.18)	40.3	41.6	High (31.7)	High (15.0)	High (15.9)
Račić 2019 ⁴⁷	Bosnia and Herzegovina	Family physicians	Compassion fatigue questionnaire	120	ND	80	75 (moderate)	ND	ND	ND
Rossouw 2013 ⁷⁸	South Africa	Family physicians	MBI	132	ND	ND	ND	High (53)	High (64)	High (43)
Çelik 2021 ^{44b}	Turkey	Family medicine residents	Burnout Measure (short version)	477	Median: 28 (range: 24–54)	61.2	25.8 (moderate); 24.1 (severe); 23.3 (very severe)	ND	ND	ND
Zhang 2021 ⁵²	China	Family physicians	MBI-General Survey (Chinese version)	2 693	44.64 (SD: 7.25)	35.6	65.2	High (30.1); moderate (24.2)	High (22.2); moderate (11.7)	High (48.3); moderate (13.3)
Engelbrecht 2008 ⁷⁹	South Africa	Community nurses	MBI	542	ND	ND	ND	High (68.7); moderate (30.9)	High (85.1); moderate (12.9)	High (8.3); moderate (91.0)
Hu 2015 ⁴⁴	China	Community nurses	MBI	420	ND	100	86.2	ND	ND	ND
Alshawish 2020 ⁶²	West Bank and Gaza Strip	Community nurses and midwives	MBI	207	ND	91.3	10.6	High (36.7); moderate (17.9)	High (14.0); moderate (20.8)	High (17.9); moderate (19.3)
Merces 2017 ³²	Brazil	Community nurses	MBI-Human Services Survey	60	39.55 (SD: 10.38)	95	58.3 (high on at least one MBI subscale); 16.7 (high on all three subscales)	High (18.3); moderate (43.3)	High (48.3); moderate (41.7)	High (56.6); moderate (41.7)
Merces 2016 ³⁰	Brazil	Community nurses	MBI	28	39.1 (SD: 9.6)	100	7.1	High (28.6); moderate (39.3)	High (21.5); moderate (32.1)	High (46.4); moderate (50.0)
Barbosa Ramos 2019 ³⁷	Brazil	Community nurses	MBI	52	ND	100	ND	High (15.4); moderate (34.6)	High (13.5); moderate (34.6)	High (23.1); moderate (21.2)
Merces 2016 ³¹	Brazil	Community nurses	MBI	189	ND	96.8	10.6	High (20.6); moderate (40.7)	High (31.7); moderate (39.2)	High (48.1); moderate (49.2)
Lorenz 2018 ³⁴	Brazil	Community nurses	MBI	168	ND	88.4	ND	High (28.0); moderate (37.5)	High (32.1); moderate (33.9)	High (38.7); moderate (33.3)
Holmes 2014 ³⁵	Brazil	Community nurses	MBI	45	ND	100	11.1	High (53.3); moderate (20.0)	High (11.1); moderate (28.9)	High (11.1); moderate (48.9)
Merces 2020 ³⁸	Brazil	Community nurses	MBI-Human Services Survey	1 125	37.1 (SD: 9.6)	87.9	18.3	High (28.1); moderate (41.1)	High (44.5); moderate (35.9)	High (60.2); moderate (36.2)

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Study and year	Country	Type of participant	Burnout measurement tool	No. of participants	Mean age of participants, years	Proportion of female participants, %	Overall burnout prevalence, %	Prevalence of burnout by MBI subscale score category, (%) ^a		
								Emotional exhaustion	Depersonalization	Personal accomplishment
García 2021 ⁴²	Brazil	Community nurses	Burnout characterization scale	122	45.2 (SD: 9.8)	94.3	ND	High (27.9); moderate (37.7)	High (25.4); moderate (41.8) ^c	High (25.4); moderate (47.5) ^d
Seluch 2021 ^{70b}	Russian Federation	Community nurses	Emotional Burnout Diagnostics by Boyko V.V.	60	40.86	100	50	ND	ND	ND
Silveira 2014 ²⁹	Brazil	Mixed primary health-care professionals	CESQT	217	ND	88.9	18 (profile 1); 11 (profile 2)	ND	ND	ND
da Silva 2008 ²⁵	Brazil	Mixed primary health-care professionals	MBI	141	38.9 (SD: 11.4)	92.2	24.1	Moderate or high (70.9)	Moderate or high (34.0)	Moderate or high (47.5)
Selamu 2019 ⁶⁴	Ethiopia	Mixed primary health-care professionals	MBI-Human Services Survey	136	ND	61	38 (at baseline); 4.6 (at 6-month follow-up)	High (7.7 at baseline; 7.5 at 6-month follow-up)	ND	High (43.7 at baseline; 48.5 at 6-month follow-up)
Hernández 2003 ⁴⁶	Cuba	Mixed primary health-care professionals	Short questionnaire of burnout	144	ND	77.1	43.8 (doctors); 27.3 (nurses)	ND	ND	ND
Ran 2020 ⁴⁷	China	Mixed primary health-care professionals	MBI-General Survey	1 279	ND	66.5	18.69	ND	ND	ND
Pinheiro 2020 ³⁹	Brazil	Mixed primary health-care professionals	CESQT	344	40 (SD: 9.7)	88.7	14.4 (profile 1); 44.5 (profile 2)	ND	ND	ND
Mao 2020 ⁴⁸	China	Mixed primary health-care professionals	MBI	663	ND	44.5	ND	High (24.1); moderate (14.6)	High (15.7); moderate (7.4)	High (34.7); moderate (15.8)
Lima 2018 ²³	Brazil	Mixed primary health-care professionals	MBI-Human Services Survey	153	45 (SD: 9.78)	82.4	51	ND	ND	ND

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Study and year	Country	Type of participant	Burnout measurement tool	No. of participants	Mean age of participants, years	Proportion of female participants, %	Overall burnout prevalence, %	Prevalence of burnout by MBI subscale score category, (%)=		
								Emotional exhaustion	Depersonalization	Personal accomplishment
Li 2019 ⁴⁶	China	Mixed primary health-care professionals	MBI–Human Services Survey	951	ND	65.1	ND	High (33.1); moderate (32.9)	High (8.8); moderate (19.8)	High (41.43); moderate (20.5)
Kruse 2009 ⁴¹	Zambia	Mixed primary health-care professionals	Single-item scale	483	37 (IQR: 31–45)	87	51.2	ND	ND	ND
Hernández-Vargas 2009 ⁸⁸	Mexico	Mixed primary health-care professionals	MBI	276	ND	ND	ND	High (34.8); moderate (30.1)	High (35.1); moderate (19.6)	High (36.2); moderate (30.4)
Xu 2020 ⁴⁹	China	Mixed primary health-care professionals	MBI	15 627	ND	66.2	3.3 (high); 47.6 (moderate)	ND	ND	ND
Wang 2020 ⁴³	China	Mixed primary health-care professionals	MBI	1 148	ND	64.72	ND	High (27.66)	High (6.06)	High (38.74)
Tonaz 2020 ⁴⁰	Brazil	Mixed primary health-care professionals	Oldenburg Burnout Inventory	94	40.9 (SD: 9.6)	84	38.3	High (21.3)	ND	ND
de Souza Filho 2019 ³⁶	Brazil	Mixed primary health-care professionals	CBQ	248	40.75 (SD: 9.66)	91.1	24.2 (profile 1); 8.5 (profile 2)	ND	ND	ND
da Silva 2021 ⁴¹	Brazil	Mixed primary health-care professionals	MBI	2 940	36.7 (SD: 9.6)	90.5	11.4 (severe)	High (39.7); moderate (24.9)	High (11.8); moderate (24.5)	High (18.3); moderate (27.2)
Lu 2020 ⁵⁰	China	Mixed primary health-care professionals	MBI	21 759	35	70.0	50.1 (total); 3.0 (severe); 47.1 (moderate)	ND	ND	ND
Yan 2021 ⁵¹	China	Mixed primary health-care professionals	MBI (Chinese version)	1 214	40.26 (SD: 8.61)	55	11.3 (severe); 37.6 (moderate)	ND	ND	ND
Malakouti 2011 ⁸⁰	Iran, (Islamic Republic of)	CHWs	MBI	212	35.1 (SD: 7.2)	70.1	1.1 (high); 16.6 (moderate)	High (12.3); moderate (15.1)	High (5.3); moderate (8.0)	High (43.7); moderate (19.0)

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Study and year	Country	Type of participant	Burnout measurement tool	No. of participants	Mean age of participants, years	Proportion of female participants, %	Overall burnout prevalence, %	Prevalence of burnout by MBI subscale score category, (%) ^a		
								Emotional exhaustion	Depersonalization	Personal accomplishment
Mota 2014 ²⁸	Brazil	G-Ms	MBI	222	ND	87.8	29.3	Moderate or high (57.7)	Moderate or high (51.8)	Moderate or high (59.0)
Martins 2014 ²⁷	Brazil	G-Ms	MBI	107	ND	ND	41.6	High (20.6); moderate (52.3)	High (21.1); moderate (50.0)	High (20.6); moderate (55.4)
Bijari 2016 ⁴¹	Iran (Islamic Republic of)	G-Ms	MBI	423	39 (SD: 8.4)	57.9	5.7 (high on all three MBI subscales); 28.8 (high on either emotional exhaustion or depersonalization subscale)	High (17.7); moderate (13.7)	High (6.4); moderate (10.4)	High (53.0); moderate (18.2)
Amin 2016 ⁸²	Iran (Islamic Republic of)	G-Ms	MBI	548	35.8 (SD: 7.5)	71	5.5 (high); 52.7 (moderate)	High (17.3); moderate (18.4)	High (8.8); moderate (10.0)	High (33.9); moderate (15.7)
Pulagam 2021 ⁴³	India	G-Ms	Copenhagen Burnout Inventory	150	ND	100	Personal burnout: 80 (high) and 30 (moderate); work burnout: 8.7 (high) and 24.7 (moderate); client burnout: 6.7 (high) and 23.3 (moderate)	ND	ND	ND
Mulira 2016 ⁴⁵	Uganda	Midwives	Professional Quality of Life scale	224	34 (SD: 6.3)	79.5	10.3 (high); 87.9 (moderate)	ND	ND	ND
Maciel 2018 ³⁵	Brazil	Community oral health team members	MBI-Human Services Survey	50	ND	72	ND	High (26); moderate (32)	High (16); moderate (26)	High (10); moderate (26)
Calgan 2011 ⁸³	Turkey	Community pharmacists	MBI	251	42.06 (SD: 11.19)	58.6	ND	High (1.2); moderate (27.1)	High (0.8); moderate (13.9)	High (71.3) Moderate (24.7)
Okuyan 2021 ⁶⁶	Turkey	Community pharmacists	Burnout Measure (short version)	1 098	41	64.8	31.5	ND	ND	ND

CESQ: Spanish Burnout Inventory (Cuestionario para la Evaluación del Síndrome de Quemarse por el Trabajo); G-M: community health worker; IQR: interquartile range; MBI: Maslach Burnout Inventory; ND: not determined; SD: standard deviation.

^a Definitions of low, moderate and high score categories for the Maslach Burnout Inventory subscales of emotional exhaustion, depersonalization and personal accomplishment are listed in Table 1.^b This study reported collecting data during the coronavirus 2019 pandemic.^c Dehumanization was assessed instead of depersonalization.^d Disappointment was assessed instead of personal accomplishment.

exposure,⁶⁶ inadequate personal protective equipment,⁶⁸ a poor level of support,^{46,48,58} job insecurity,^{38,63,64} specific job tasks,⁴⁵ and inadequate rest breaks or vacation time.^{38,73} Eleven studies found a positive association between burnout and years of service,^{29,38,41,44,48,54,57,63,75,80,81} whereas five found a negative association.^{33,62,69,78,83} The work-related consequences of burnout included a lack of job satisfaction,^{24,33,45,55} and an intention to change jobs.^{24,34,43,47} Burnout was also significantly associated with physical or psychological illness,^{27,62,66,67,76,81} smoking,^{24,38,76} a lack of exercise,^{38,60} and the distance travelled to work.³⁹ The distance travelled to work and being asked to complete work tasks beyond the individual's expertise were associated factors only in low-income and lower-middle-income countries. Protective factors identified included exercise, rest breaks and vacation time.^{38,60,73}

Quality assessment and publication bias

The risk of bias was calculated for each study: 46.7% of studies (28/60) scored between 5 and 7 points, which indicated a moderate risk of bias, and 53.3% (32/60) scored between 8 and 10 points, which indicated a low risk of bias. Studies scored well in domains relating to internal validity but less well in domains related to external validity, such as representative sampling frames and sampling methods.

The Doi plot for a high depersonalization subscale score was symmetrical, with a low LFK index (0.03), which suggests a low risk of publication bias. However, the Doi plots for a high emotional exhaustion subscale score and a high personal accomplishment subscale score demonstrated minor asymmetry, with an LFK index of -1.08 and -1.11, respectively, which suggests a small risk of publication bias. Full details of the risk of bias assessment are available from the data repository.¹⁷

Discussion

Our findings suggest that the prevalence of burnout among primary health-care professionals in low- and middle-income countries is substantial, perhaps unsurprisingly in view of the workforce and resource shortages in these countries.^{14,84} However, given that the consequences of burnout include increased sick leave, staff turnover and emigration, there are

Table 4. Prevalence of burnout by Maslach Burnout Inventory subscale score category, meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022

Maslach Burnout Inventory subscale score category ^a	Pooled prevalence, % (95% CI) ^b
Emotional exhaustion	
High	28.1 (21.5–33.5)
Moderate	27.6 (21.1–33.0)
Low	44.3 (36.6–49.9)
Depersonalization	
High	16.4 (10.1–22.9)
Moderate	22.7 (15.2–29.7)
Low	60.9 (50.5–67.6)
Personal accomplishment	
High	31.9 (21.7–39.1)
Moderate	28.1 (18.5–35.3)
Low	39.9 (28.7–47.0)

CI: confidence interval.

^a Definitions of low, moderate and high Maslach Burnout Inventory score categories are listed in Table 1.

^b Prevalence was pooled across 31 studies.

implications for workforce planning and the recruitment and retention of primary health-care professionals in countries where understaffing is already a critical issue. Any increased desire to emigrate could exacerbate the so-called brain drain from these countries to high-income countries.⁸ Policy-makers in low- and middle-income countries may need to work with policy-makers in high-income countries to identify solutions.

We found that the prevalence of emotional exhaustion and depersonalization was highest among primary care nurses, whereas the prevalence of reduced personal accomplishment was highest among CHWs. The high prevalence of burnout among nurses may affect patient safety as they are the main providers of community health care in some low- and middle-income countries. Longitudinal studies are needed to identify causal factors and to determine ways of reducing work demands on primary care nurses. One solution may be to increase the number of family physicians to provide professional support and clinical expertise. However, burnout is also common among family physicians and, therefore, any restructuring of roles and responsibilities must bear this in mind. Although international studies suggest that overall burnout levels among family physicians are similar in low- and middle-income countries and high-income countries, there are differences in the prevalence of each dimension of burnout for different cadres. For example, the prevalence of deperson-

alization is lower among primary care nurses in high-income countries than in low- and middle-income countries.^{83,86} This result may reflect differences in the responsibilities, workload and type of work expected of primary care nurses in low- and middle-income countries, where they are often responsible for diagnosis, treatment and performing basic procedures.⁸⁷ Additionally, in contrast to observations in high-income countries,²⁴ studies in our review suggest that reduced personal accomplishment is the most prevalent dimension of burnout for family physicians and CHWs in low- and middle-income countries. These results may reflect limited opportunities for further education, professional development and career progression in these countries. Policy-makers need to be aware of these differences, to work actively to identify individuals most at risk of burnout and to develop targeted interventions.

We were unable to compare findings from the three studies conducted during the COVID-19 pandemic with pooled pre-pandemic data because different measurement tools were used. However, the estimated overall prevalence of burnout in two of these studies was higher than the pooled prevalence we found for the individual Maslach Burnout Inventory subscales,^{69,78} which is in line with the findings of a global survey of health-care professionals that used a single-item scale to assess burnout during the COVID-19 pandemic and found a prevalence of 51%.⁸⁸ Additionally, we found no clear differ-

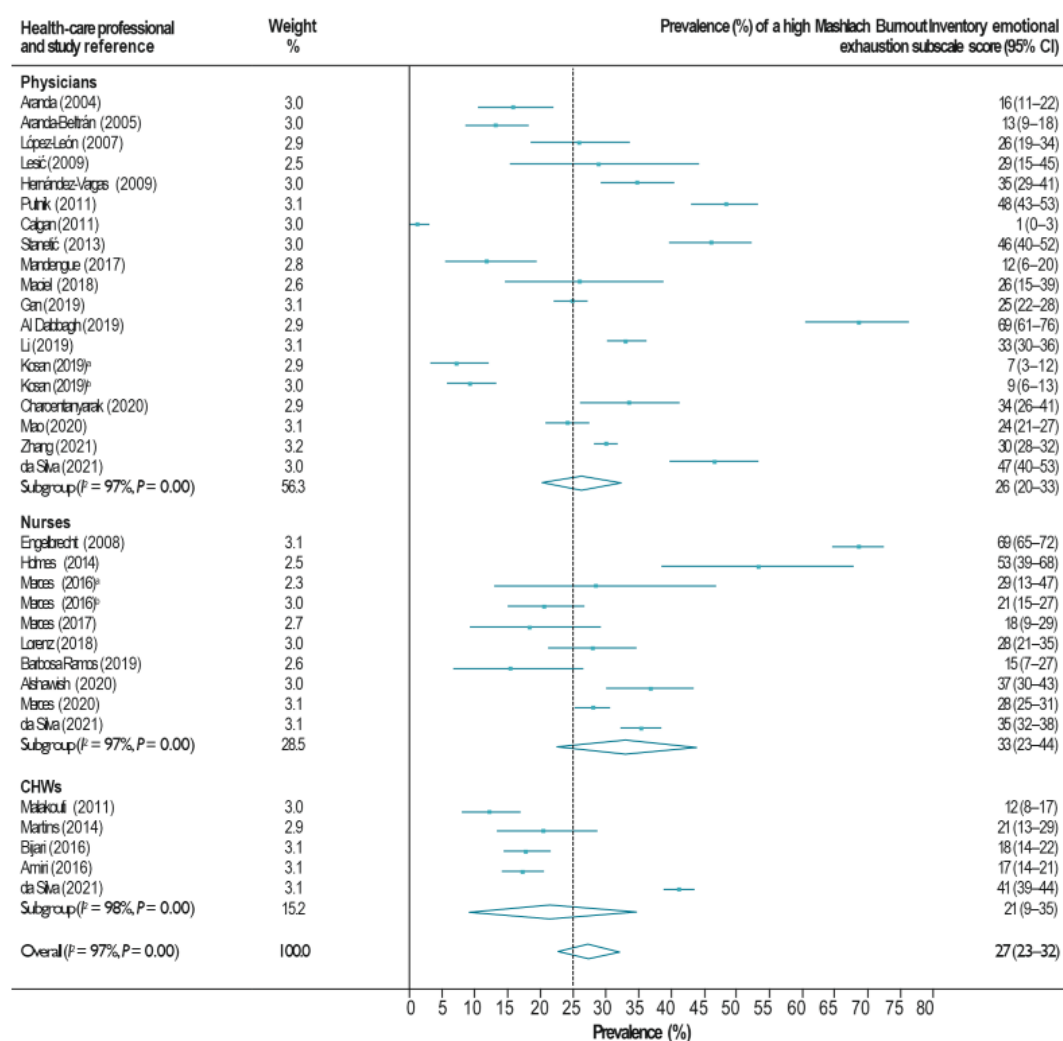
ence in burnout prevalence between upper-middle-income countries and lower-middle-income and low-income countries. Again, this result was partly due to differences in the definition of burnout and in the measurement tools used, which made comparisons difficult.

In line with previous research,⁸⁹ we found conflicting evidence on the association between burnout and sex. This outcome may have been due to: differences in how men and women ex-

perience burnout;⁸⁹ cultural differences in sex roles;⁷¹ or cultural and sex differences in the importance of protective factors such as social support.^{90,91} Our findings suggest that burnout is more common in younger age groups. Younger professionals early in their careers may have greater family responsibilities, which could lead to increased conflict between work and home life and which, combined with lower professional self-efficacy, could result in a higher risk of

burnout.⁹² In contrast to studies from high-income countries,⁹³ 11 studies in our review found that the prevalence of burnout also increased with the number of years of service; it may be that limited opportunities for career development in low- and middle-income countries lead to frustration and burnout over the years. Our findings imply that burnout prevalence peaks in health workers both at an early career stage and much later in their careers. Consequently, policies and

Fig. 2. Prevalence of a high Maslach Burnout Inventory emotional exhaustion subscale score, by health-care professional type and study, meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022



CHWs community health workers; CI: confidence interval.

Notes: A high Maslach Burnout Inventory emotional exhaustion subscale score is defined in Table 1. For the Kosan 2019 study, data are represented separately for 2008 (Kosan 2019a) and 2012 (Kosan 2019b). The Merces 2016a study refers to the paper by Merces M, Carneiro e Cordeiro T, et al. 2016.⁹⁴ The Merces 2016b study refers to the paper by Merces M, Silva D, et al. 2016.⁹⁵

interventions to mitigate and prevent burnout should be targeted at these two career stages.

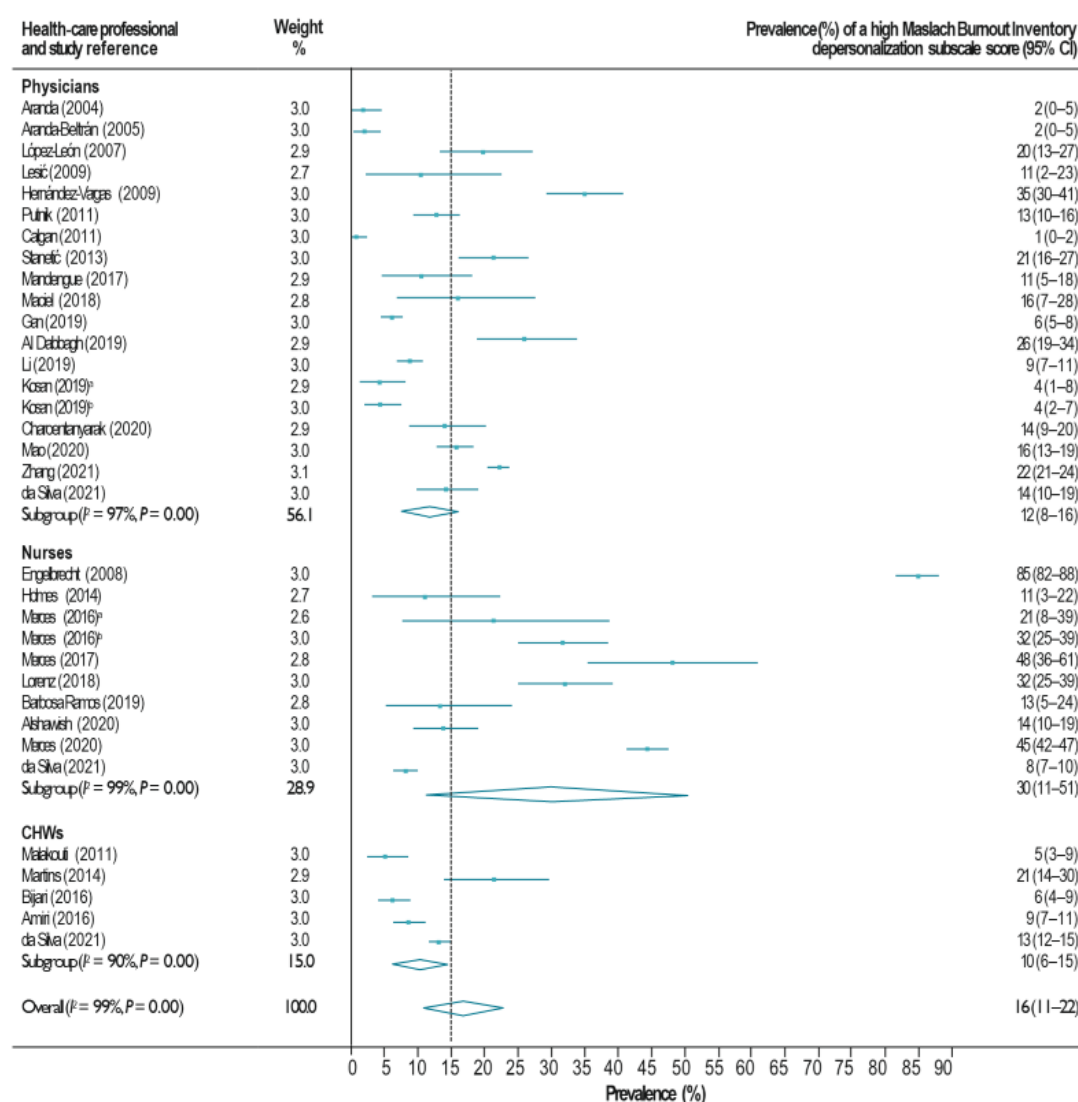
The evidence from our review confirms, as previously established,⁹³ that burnout is associated with heavy workloads, few workplace resources, insufficient workplace support and conflict at work. One study conducted during the COVID-19 pandemic found that increased exposure to COVID-19 patients and the requirement to supply

one's own personal protective equipment were both positively associated with burnout.⁸ Another highlighted the need for specific pandemic training and increased organizational resources and support.⁶⁹ These results are in line with findings from high-income countries, which highlight the increased workload and stress associated with exposure to COVID-19 patients, the need for extra training and support, and the importance of adequate personal protective

equipment.^{12,88} Several studies in our review identified factors that protected against burnout, such as regular exercise, regular rest breaks and time away from work,^{38,60,73} which could be incorporated into the culture of primary care.

The geographical spread of studies in our review highlights the dearth of research on primary care burnout in low- and middle-income countries, specifically in Africa and South-East Asia, which are the WHO regions with the

Fig. 3. Prevalence of a high Maslach Burnout Inventory depersonalization subscale score, by health-care professional type and study, meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022



CHWs: community health workers; CI: confidence interval.

Notes: A high Maslach Burnout Inventory depersonalization subscale score is defined in Table 1. For the Kosan 2019 study, data are represented separately for 2008 (Kosan 2019a) and 2012 (Kosan 2019b). The Merces 2016a study refers to the paper by Merces M, Carneiro e Cordeiro T, et al. 2016.³⁰ The Merces 2016b study refers to the paper by Merces M, Silva D, et al. 2016.³¹

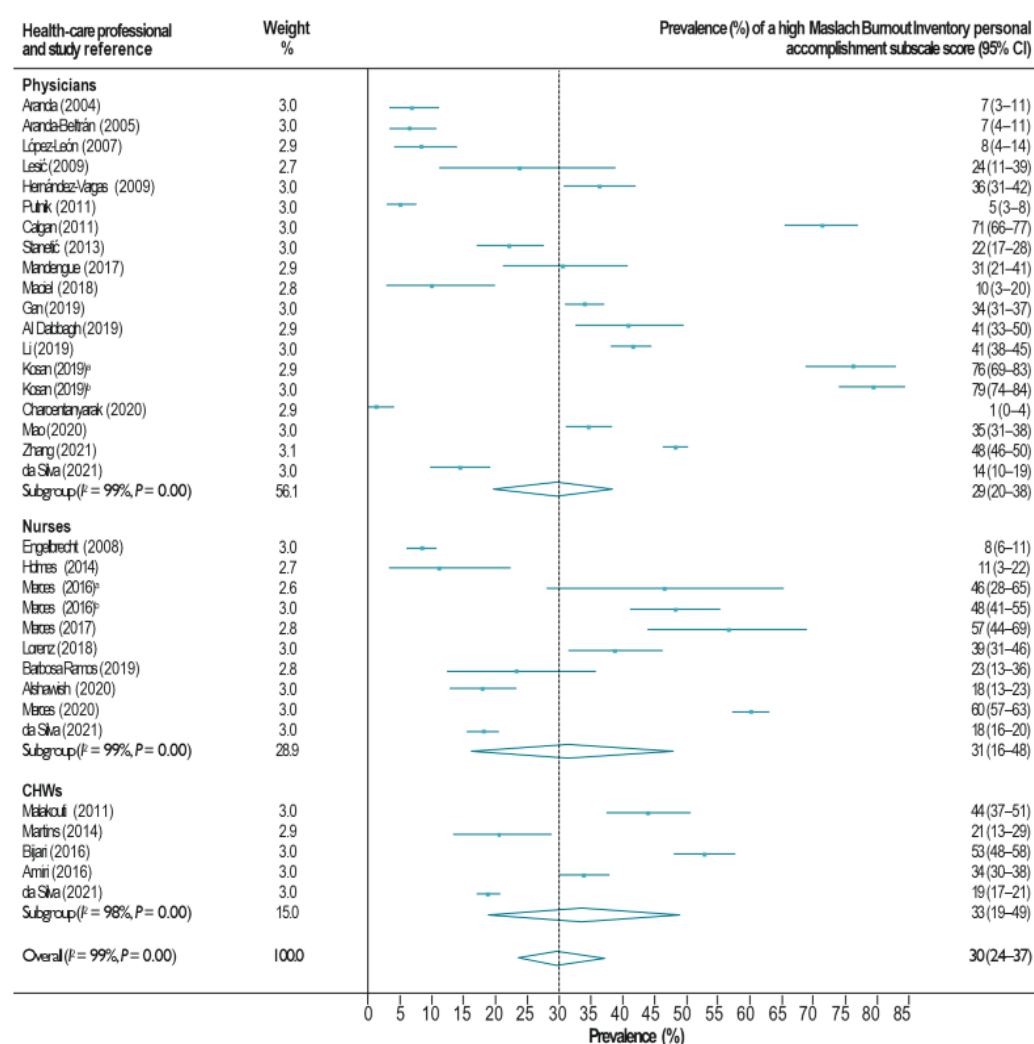
greatest shortages of health-care professionals.³⁴ Moreover, most studies were performed in upper-middle-income countries, which limits the generalizability of our results to lower-resource settings. This finding highlights the urgent need for research in low-income and lower-middle-income countries. Importantly, 43% of studies in our review were published from 2019 onwards, possibly reflecting increasing awareness that a healthy primary care workforce is essential for achieving UHC.⁴³

Study heterogeneity was high due to the breadth of primary health-care professionals included, the geographical spread of the studies and the variety of burnout measurement tools used. The variety of cultures, economies, disease burdens and political, educational and health systems in study countries would have resulted in differences in workload, resource availability and training, which may have contributed to large variations in the working environment and personal

coping strategies between countries. However, the quality of the studies was good as no study was assessed as having a high risk of bias.

We conducted this study using a robust systematic review method and preregistered the study protocol on the PROSPERO website which ensured transparency. However, searches were limited to electronic databases and reference lists. Grey literature was not searched, which means that some data may have been missed, although the

Fig. 4. Prevalence of a high Maslach Burnout Inventory personal accomplishment subscale score, by health-care professional type and study, meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022



CHWs community health workers; CI confidence interval.

Notes: A high Maslach Burnout Inventory personal accomplishment subscale score is defined in Table 1. A high score indicates reduced personal accomplishment. For the Kosan 2019 study, data are represented separately for 2008 (Kosan 2019a) and 2012 (Kosan 2019b). The Merces 2016a study refers to the paper by Merces M, Carneiro e Cordeiro T, et al. 2016.³⁰ The Merces 2016b study refers to the paper by Merces M, Silva D, et al. 2016.³¹

CI: 10,1-22,9), 个人成就感严重缺失的流行率为 31,9% (95% CI: 21,7-39,1)。
结论 低收入和中等收入国家初级医疗护理工作者的职业倦怠率对患者安全、护理质量和人力规划会产生

影响。需要开展进一步的横断面研究来帮助确定有证据支持的解决方案,特别是在非洲和东南亚地区。

Résumé

Épuisement chez les professionnels des soins de santé primaires dans les pays à revenu faible ou intermédiaire: revue systématique et méta-analyse

Objectif Estimer la prévalence de l'épuisement professionnel (burnout) chez les professionnels des soins de santé primaires dans les pays à revenu faible ou intermédiaire et identifier les facteurs associés à l'épuisement professionnel.

Méthodes Nous avons effectué une recherche systématique dans neuf bases de données jusqu'en février 2022 afin d'identifier les études portant sur l'épuisement chez les professionnels des soins de santé primaires dans les pays à revenu faible ou intermédiaire. Il n'y avait aucune limitation linguistique et nous avons inclus des études observationnelles. Deux examinateurs indépendants ont effectué le screening, la sélection des études, l'extraction des données et l'évaluation de la qualité. Une méta-analyse à effets aléatoires a été utilisée pour estimer la prévalence globale de l'épuisement professionnel, évaluée à l'aide des sous-échelles d'épuisement émotionnel, de dépersonnalisation et d'accomplissement personnel du Maslach Burnout Inventory. Voici un rapport narratif des facteurs associés à l'épuisement professionnel.

Résultats Nos recherches ont permis d'identifier 1568 articles. Après sélection, 60 études provenant de 20 pays ont été incluses dans

l'examen narratif, et 31 ont été incluses dans la méta-analyse. Trois études ont recueilli des données pendant la pandémie de Covid-19, mais ont fourni des preuves limitées de l'impact de cette maladie sur l'épuisement professionnel. La prévalence globale à point unique de l'épuisement professionnel variait de 2,5 à 87,9% (43 études). Dans la méta-analyse (31 études), la prévalence collective d'un niveau élevé d'épuisement émotionnel était de 28,1% (intervalle de confiance (IC) à 95%: 21,5–33,5), un niveau élevé de dépersonnalisation était de 16,4% (IC à 95%: 10,1–22,9) et un niveau élevé d'accomplissement personnel réduit était de 31,9% (IC à 95%: 21,7–39,1).

Conclusion La prévalence notable de l'épuisement professionnel chez les professionnels des soins de santé primaires dans les pays à revenu faible ou intermédiaire a des implications pour la sécurité des patients, la qualité des soins et la planification des effectifs. D'autres études transversales sont nécessaires pour aider à identifier des solutions empiriques, en particulier en Afrique et en Asie du Sud-Est.

Резюме

Профессиональное выгорание среди специалистов первичной медико-санитарной помощи в странах с низким и средним уровнем дохода: систематический обзор и метаанализ

Цель Оценить распространенность профессионального выгорания среди специалистов первичной медико-санитарной помощи в странах с низким и средним уровнем дохода, а также выявить факторы, связанные с профессиональным выгоранием.

Методы Авторы провели систематический поиск по девяти базам данных, собранных до февраля 2022 года, и выявили исследования о профессиональном выгорании среди специалистов первичной медико-санитарной помощи в странах с низким и средним уровнем дохода. Языковых ограничений не было. Были включены наблюдательные исследования. Два независимых эксперта провели скрининговое обследование, отбор исследований, извлечение данных и оценку качества. Для оценки общей распространенности профессионального выгорания использовался метаанализ случайных эффектов с помощью подшкал опросника выгорания Маслач для определения эмоционального истощения, деперсонализации и личных достижений. Авторы описательно сообщают о факторах, связанных с профессиональным выгоранием.

Результаты В результате поиска обнаружено 1568 статей. После завершения отбора 60 исследований из 20 стран

были включены в описательный анализ, а 31 – в метаанализ. Три исследования собрали данные во время пандемии коронавирусной инфекции 2019 года, но представили ограниченные данные о влиянии болезни на профессиональное выгорание. Общая распространенность профессионального выгорания колебалась от 2,5 до 87,9% (43 исследования). В метаанализе (31 исследование) общая распространенность высокого уровня эмоционального истощения составила 28,1% (95%-й ДИ: 21,5–33,5), высокий уровень деперсонализации составил 16,4% (95%-й ДИ: 10,1–22,9), а высокий уровень снижения личных достижений составил 31,9% (95%-й ДИ: 21,7–39,1).

Вывод Значительная распространенность эмоционального выгорания среди специалистов первичной медико-санитарной помощи в странах с низким и средним уровнем дохода влияет на безопасность пациентов, качество медицинской помощи и планирование трудовых ресурсов. Необходимы дальнейшие поперечные исследования для поиска основанных на фактических данных решений, особенно в Африке и Юго-Восточной Азии.

Resumen

El desgaste entre los profesionales de la atención primaria de salud en los países de ingresos bajos y medios: revisión sistemática y metanálisis

Objetivo Estimar la prevalencia del desgaste profesional entre los profesionales de la atención primaria de salud en los países de ingresos bajos y medios e identificar los factores que se asocian a este síndrome.

Métodos Se realizaron búsquedas sistemáticas en nueve bases de datos hasta febrero de 2022 para identificar estudios que investigaran el desgaste profesional en profesionales de la atención primaria de

países de ingresos bajos y medios. No hubo limitaciones de idioma y se incluyeron estudios observacionales. Dos revisores independientes completaron el cribado, la selección de estudios, la extracción de datos y la evaluación de la calidad. Se utilizó el metanálisis de efectos aleatorios para estimar la prevalencia global del desgaste profesional, evaluada mediante las subescalas de agotamiento emocional, despersonalización y realización personal del Maslach Burnout Inventory. En este documento, se describen los factores asociados al síndrome de desgaste profesional.

Resultados La búsqueda arrojó 1568 artículos. Tras la selección, se incluyeron 60 estudios de 20 países en la revisión narrativa y 31 en el metanálisis. Tres estudios recopilaban datos durante la pandemia de la enfermedad por coronavirus de 2019, pero proporcionaron pruebas limitadas sobre el impacto de la enfermedad en el desgaste profesional.

La prevalencia global de un único punto sobre el desgaste profesional osciló entre el 2,5 y el 87,9 % (43 estudios). En el metanálisis (31 estudios), la prevalencia conjunta de un nivel alto de agotamiento emocional fue del 28,1 % (intervalo de confianza del 95 %, IC: 21,5–33,5), un nivel alto de despersonalización fue del 16,4 % (IC del 95 %: 10,1–22,9) y un nivel alto de disminución de la realización personal fue del 31,9 % (IC del 95 %: 21,7–39,1).

Conclusión La considerable prevalencia del desgaste profesional entre los profesionales de la atención primaria en los países de ingresos bajos y medios tiene implicaciones para la seguridad de los pacientes, la calidad de la atención y la planificación del personal. Se necesitan más estudios transversales para ayudar a identificar soluciones fundamentadas en la evidencia, en especial en África y Asia Sudoriental.

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Box 1. Search term combinations used in the meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022

- (I) primary health-care providers, such as ("general practi*", ("family physician"), ("primary NB care"), ("community health care"), ("community health work*") and ("community NB nurse");
- (II) with terms for burnout, such as ("burnout"), ("compassion fatigue"), ("emotional exhaustion"), (disengage*), ("occupation* NB stress*") and ("work* NB stress*"); and
- (III) terms for low- and middle-income countries that included each country name along with additional terms such as ("MH "Developing Countries"), ("middle income* V0 (count* OR nation OR nations OR econom*)), ("low* income" V0 (count* OR nation OR nations OR econom*)), ("third world V0 (count* OR nation OR nations OR econom*)), ("less* developed V0 (count* OR nation OR nations OR econom*)), (Africa*), (West* V0 Asia*), ((South OR Southern) V0 Asia*), ((Latin OR Central OR South) V0 America*), ((Middle OR Far) V0 East) and (Caribbean* OR West Indies*).

Box 2. Study eligibility criteria, meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022**Inclusion criteria**

- Study design: cross-sectional or cohort study
- Study setting: low- or middle-income country, as defined by the World Bank's 2020 income classification¹⁸
- Study population: primary health-care professionals working in community settings
- Primary outcome of study: burnout prevalence as assessed using a validated burnout measurement tool or by self-report
- Secondary outcome of study: factors associated with burnout

Exclusion criteria

- Duplicates of publications or secondary research, such as narrative reviews or opinion pieces
- Studies in high-income countries, as defined by the World Bank's 2020 income classification¹⁸
- Studies involving or including hospital-based secondary care professionals or specialists that report no separate data for primary care practitioners
- Studies on medical students
- Research on anxiety, depression or occupational stress that does not have a specific focus on burnout

Box 3. Data sets, by WHO region and country, meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022**Region of the Americas (25 studies)**

18 studies from Brazil; six studies from Mexico; and one study from Cuba.

European Region (11 studies)^a

Five studies from Turkey; two studies from Bosnia and Herzegovina; two studies from Serbia; one study from Bulgaria; and one study from the Russian Federation.

Western Pacific Region (10 studies)

10 studies from China.

Eastern Mediterranean Region (seven studies)

Four studies from the Islamic Republic of Iran; one study from Egypt; one study from Iraq; and one study from West Bank and Gaza Strip.

African Region (six studies)

Two studies from South Africa; one study from Cameroon; one study from Ethiopia; one study from Uganda; and one study from Zambia.

South-East Asia Region (two studies)

One study from India; and one study from Thailand.

WHO World Health Organization.

^a One study included data from Bulgaria and Turkey.

Table 2. Study participant type, meta-analysis of burnout in primary health-care professionals in low- and middle-income countries up to 2022

Study participants	No. (%) of studies (n= 60)
Family physicians	20 (33.3)
Mixed primary health-care professionals	18 (30.0)
Community nurses and nursing assistants	12 (20.0)
CHWs	6 (10.0)
Community pharmacists	2 (3.3)
Community midwives	1 (1.7)
Community oral health team members	1 (1.7)

CHW=community health worker.

Systematic review

1. * Review title.

Give the title of the review in English

A systematic review of the prevalence and determinants of burnout in primary healthcare workers in low- and middle- income countries

2. Original language title.

For reviews in languages other than English, give the title in the original language. This will be displayed with the English language title.

3. * Anticipated or actual start date.

Give the date the systematic review started or is expected to start.

19/10/2020

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

31/12/2021

5. * Stage of review at time of this submission.

Tick the boxes to show which review tasks have been started and which have been completed. Update this field each time any amendments are made to a published record. **Reviews that have started data extraction (at the time of initial submission) are not eligible for inclusion in PROSPERO.** If there is later evidence that incorrect status and/or completion date has been supplied, the published PROSPERO record will be marked as retracted.

This field uses answers to initial screening questions. It cannot be edited until after registration.

The review has not yet started: No

Review stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
Data extraction	Yes	Yes

Risk of bias (quality) assessment	Yes	Yes
Data analysis	No	No
Provide any other relevant information about the stage of the review here.		

6. * Named contact.

The named contact is the guarantor for the accuracy of the information in the register record. This may be any member of the review team.

Tanya Wright

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

Dr Wright

7. * Named contact email.

Give the electronic email address of the named contact.

t.r.wright@keele.ac.uk

8. Named contact address

Give the full institutional/organisational postal address for the named contact.

Keele University, School of Medicine, Keele, Staffordshire, ST5 5BG,
United Kingdom.

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

+44 1782 733937

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

Keele
University
Organisati
on web
address:

11. * Review team members and their organisational affiliations.

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong. **NOTE: email and country now MUST be entered for each person, unless you are amending a published record.**

Dr Tanya Wright. Keele University
Dr Faraz Mughal. Keele University
Dr Toby Helliwell. Keele University
Dr Opeyemi Babatunde. Keele University
Professor Lisa Dikomitis.
Keele University
Professor Christian
Mallen. Keele University

12. Funding sources/sponsors.

Details of the individuals, organizations, groups, companies, or other legal entities who have funded or sponsored the review.
None

Grant number(s)

State the funder, grant or award number and the date of award

13. * Conflicts of interest.

List actual or perceived conflicts of interest (financial or academic).
None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. **NOTE: email and country must be completed for each person, unless you are amending a published record.**

15. * Review question.

State the review question(s) clearly and precisely. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS or similar where relevant.

1. To estimate the prevalence of burnout among primary healthcare practitioners in LMICs.
2. To compare the prevalence of burnout in primary healthcare practitioners in different countries/regions.
3. To identify risk factors associated with burnout.
4. To identify factors that protect against burnout

16. * Searches.

State the sources that will be searched (e.g. Medline). Give the search dates, and any restrictions (e.g. language or publication date). Do NOT enter the full search strategy (it may be provided as a link or attachment below.)

MEDLINE
CINAHL plus
APA PsycINFO
APA PsycARTICLES
AMED
EMBASE
Web of Science core collection
CNKI
WHO Global Index Medica database

No
restrictions

17. URL to search strategy.

Upload a file with your search strategy, or an example of a search strategy for a specific database, (including the keywords) in pdf or word format. In doing so you are consenting to the file being made publicly accessible. Or provide a URL or link to the strategy. Do NOT provide links to your search **results**.

<https://1drv.ms/w/s!AiOnLc60AB6GgqlwnogpbhdcDBwAPw?e=KoEkVX>

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Do not make this file publicly available until the review is complete.

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied in your systematic review.

This review is looking at burnout syndrome. According to the World Health Organisation (WHO) burnout is a syndrome comprised of the three dimensions of physical and mental exhaustion; increased professional cynicism or negativity; and decreased professional competence or effectiveness (WHO, 2020). Burnout occurs mainly in occupations such as healthcare, which involve constant and intense interactions with those who have physical and emotional needs, and risk factors include understaffed and under-resourced work environments (Bährer-Kohler, 2013). Furthermore, burnout may directly impact staff welfare, and the quality of care (Dewa et al., 2017; Salyers et al., 2016; Tawfik et al., 2019; Willard-Grace et al., 2019).

19. * Participants/population.

Specify the participants or populations being studied in the review. The preferred format includes details of both inclusion and exclusion criteria.

Inclusion - Qualified health care practitioners (doctors, nurses, midwives, traditional birth attendants, traditional healers, and community health workers) working in primary healthcare settings. Exclusion Primary health care students

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the interventions or the exposures to be reviewed. The preferred format includes details of both inclusion and exclusion criteria. Severity of burnout as measured by a validated burnout measurement tool or by self-report. Gold standard is

Maslach Burnout Inventory (MBI-HSS), but other possibilities include the abbreviated MBI (aMBI), the Copenhagen Burnout Inventory (CBI), the Oldenberg Burnout Inventory (OLBI), the Burnout Measure – short version, and the Professional Fulfillment Index (PFI). Excluded is research on anxiety, depression or occupational stress which does not have a specific focus on burnout.

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the intervention/exposure will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

No comparator/control

22. * Types of study to be included.

Give details of the study designs (e.g. RCT) that are eligible for inclusion in the review. The preferred format includes both inclusion and exclusion criteria. If there are no restrictions on the types of study, this should be stated.

Cross-sectional
and cohort studies

23. Context.

Give summary details of the setting or other relevant characteristics, which help define the inclusion or exclusion criteria.

Research conducted in any low- or middle- income countries as defined by the World Bank income classification 2020. Research in high-income countries (defined by World Bank income classification 2020) will be excluded.

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurements are made, if these are part of the review inclusion criteria.

Primary outcome: Overall prevalence of burnout measured by a recognised measurement tool or self-report – point and period prevalence and prevalence of burnout for each burnout subscale (emotional exhaustion, depersonalisation, and personal achievement). Secondary outcomes: associated risk and/or protective factors

Measures of effect

Please specify the effect measure(s) for you main outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

Overall prevalence estimates, subject to suitable data being available.

25. * Additional outcome(s).

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state 'None' or 'Not applicable' as appropriate to the review

None

Measures of effect

Please specify the effect measure(s) for you additional outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

Not applicable

26. * Data extraction (selection and coding).

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

Data to be extracted:

Authors

Year of study

Type of publication – journal, conference abstract etc.

Country

LMIC region
 Income bracket (low, lower-middle, upper-middle)
 Study design
 Sampling procedure
 Sample size
 Type of primary healthcare setting – e.g. urban/rural
 Burnout measurement tool used
 Burnout prevalence and severity: overall prevalence if estimated, as well as prevalence of high score on each of the 3 subscales
 Any associations noted – e.g. Age, gender, marital status, number of dependants, years since qualifying, work intensity, work pattern, work/care setting
 Studies will be selected based on fulfilling the inclusion criteria for condition, population, and setting. The lead reviewer (TW) will screen titles with 10% also being screened by the second reviewer (FM), and then TW and FM will screen abstracts and full texts for relevance. Two reviewers (TW and FM) will extract data independently from included studies and record it on an excel spreadsheet. The extracted data will then be compared. Any differences, either at screening or data extraction stages, will be resolved by discussion.

27. * Risk of bias (quality) assessment.

State which characteristics of the studies will be assessed and/or any formal risk of bias/quality assessment tools that will be used.

Hoy et al, 2012 risk of bias tool for prevalence studies will be used for quality assessment. This is a 10-point checklist for prevalence studies with a score of 0-4 = high risk of bias; 5-7 = moderate risk; 8-10 = low risk.

(<https://www.ScienceDirect.com/science/article/pii/S0895435612000790>)

28. * Strategy for data synthesis.

Describe the methods you plan to use to synthesise data. This **must not be generic text** but should be **specific to your review** and describe how the proposed approach will be applied to your data. If metaanalysis is planned, describe the models to be used, methods to explore statistical heterogeneity, and software package to be used.

We plan to conduct a narrative synthesis of the findings from all included studies. Details from each study will be tabulated according to population, country, sample size, burnout measure used, prevalence estimate and any associated factors. This will enable patterns to be identified and any similarities or differences to be explored. Prevalence will be compared between countries and professional sub-groups (community nurses, doctors, health workers). We anticipate a high degree of heterogeneity between studies and therefore scope for meta-analysis may be limited as there are several different burnout measures that are used which do not all measure the same dimensions of burnout. For those studies that use similar burnout measure, we will synthesize the data using random-effects meta-analysis to provide pooled prevalence estimates for each dimension measured and for each sub-group, if the data allows. Clinical heterogeneity will be explored based on the study characteristics such as professional groups and settings of care. Statistical heterogeneity will be assessed using forest plots, calculating χ^2 and I^2 . An I^2 result of 60% or more will be considered as substantial heterogeneity. Publication bias will also be assessed.

29. * Analysis of subgroups or subsets.

State any planned investigation of 'subgroups'. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach.

Sub-groups will be based on professional role, and differences and similarities in the main outcomes and associated factors between these groups will be explored. Where studies have used the same burnout measure pooled prevalence estimates using random-effects meta-analysis will be calculated for each subgroup.

30. * Type and method of review.

Select the type of review, review method and health area from the lists below.

Type of review

Cost effectiveness

No

Diagnostic

No

Epidemiologic

Yes

Individual patient data (IPD) meta-analysis

No

Intervention

No

Living systematic review

No

Meta-analysis

No

Methodology

No

Narrative synthesis

Yes

Network meta-analysis

No

Pre-clinical

No

Prevention

No

Prognostic

No

Prospective meta-analysis (PMA)

No

Review of reviews

No

Service delivery

No

Synthesis of qualitative studies

No

Systematic review

Yes

Other

No

Health area of the review

Alcohol/substance misuse/abuse

No

Blood and immune system

No

Cancer

No

Cardiovascular

No

Care of the elderly

No

Child health

No

Complementary therapies

No

COVID-19

No

Crime and justice
No
Dental
No
Digestive system
No
Ear, nose, and throat
No
Education
No
Endocrine and metabolic disorders
No
Eye disorders
No
General interest
No
Genetics
No
Health inequalities/health equity
No
Infections and infestations
No
International development
No
Mental health and behavioural conditions
Yes
Musculoskeletal
No
Neurological
No
Nursing
No
Obstetrics and gynaecology
No
Oral health
No
Palliative care
No
Perioperative care
No
Physiotherapy
No
Pregnancy and childbirth
No
Public health (including social determinants of health)
No
Rehabilitation
No
Respiratory disorders
No
Service delivery
No
Skin disorders
No
Social care
No
Surgery
No
Tropical Medicine
No
Urological
No
Wounds, injuries, and accidents

No
Violence and abuse

No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error. **English**

There is not an English
language summary.

32. * Country.

Select the country in which the review is being carried out. For multi-national collaborations select all the countries involved. **England**

33. Other registration details.

Name any other organisation where the systematic review title or protocol is registered (e.g. Campbell, or The Joanna Briggs Institute) together with any unique identification number assigned by them. If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

If the protocol for this review is published provide details (authors, title, and journal details, preferably in Vancouver format)

Add web link to the published protocol.

Or upload your published protocol here in pdf format. Note that the upload will be publicly accessible.

No, I do not make this file publicly available until the review is complete.

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Do you intend to publish the review on completion?

Yes

Give brief details of plans for communicating review findings.?

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords help PROSPERO users find your review (keywords do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

Professional burnout; Primary health care; Burnout; Health Care professional; Family Medicine; Primary care; low- and middle-income country

37. Details of any existing review of the same topic by the same authors.

If you are registering an update of an existing review give details of the earlier versions and include a full bibliographic reference, if available. **38. * Current review status.**

Update review status when the review is completed and when it is published. New registrations must be ongoing, so this field is not editable for initial submission.

Please provide anticipated publication date

Review_Ongoing

39. Any
additional
information.

Provide any other information relevant to the registration of this review.

40. Details of final report/publication(s) or
preprints if available.

Leave empty until publication details are available OR you have a link to a preprint
(NOTE: this field is not editable for initial submission). List authors, title, and journal
details preferably in Vancouver format.

Give the link to the published review or preprint.

Appendix D: Search strategy (MEDLINE)

S1	(MM "Burnout, Psychological+") OR "burnout"	17,551
S2	TI burnout OR AB burnout	11,764
S3	TI "compassion fatigue" OR AB "compassion fatigue"	747
S4	TI emotion* N3 exhaust* OR AB emotion* N3 exhaust*	2,912
S5	TI disengage* OR AB disengage*	5,250
S6	TI deperson* OR AB deperson*	3,052
S7	TI occupation* N3 stress* OR AB occupation* N3 stress*	3,358
S8	TI work* N3 stress* OR AB work* N3 stress*	12,976
S9	TI job* N3 stress* OR AB job* N3 stress*	3,905
S10	TI ((job or work* or occupation*) N3 engage*) OR AB ((job or work* or occupation*) N3 engage*)	6,569
S11	(MM "Occupational Stress+")	10,491
S12	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11	45,675
S13	(MH "Physicians, Family") OR (MH "Physicians, Primary Care") OR "family physician"	24,297
S14	(MH "General Practitioners") OR "general practitioner"	25,662
S15	(MH "Family Practice") OR "family practice" OR (MH "General Practice+")	81,914
S16	(MH "Primary Health Care+") OR "primary health care" OR (MH "Primary Care Nursing") OR (MH "Community Health Services+")	461,277
S17	TI ("general practi*" OR GP) OR AB ("general practi*" OR GP)	108,941
S18	TI (primary N2 care*) OR AB (primary N2 care*)	143,572
S19	TI ("family practi*" or "family med*") OR AB ("family practi*" or "family med*")	20,377
S20	TI "family physician*" OR AB "family physician*"	14,451
S21	TI "family doctor*" OR AB "family doctor*"	4,578
S22	(MH "Ambulatory Care+")	52,833
S23	TI (ambulatory N2 care*) OR AB (ambulatory N2 care*)	12,805
S24	TI "community health service*" OR AB "community health service*"	1,197
S25	TI "community health care*" or "community health work*" or (community N3 nurse*) or (community N3 midwif*) OR AB "community health care*" or "community health work*" or (community N3 nurse*) or (community N3 midwif*)	16,410
S26	S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25	727,455
S27	(MH "Developing Countries")	74,043
S28	TI (("middle income*" W0 (countr* or nation or nations or econom*))) OR AB (("middle income*" W0 (countr* or nation or nations or econom*)))	19,150
S29	TI ((developing W0 (countr* or nation or nations or econom*))) OR AB ((developing W0 (countr* or nation or nations or econom*)))	59,365

S30	TI (((underdeveloped or "under developed") W0 (countr* or nation or nations or econom*))) OR AB (((underdeveloped or "under developed") W0 (countr* or nation or nations or econom*)))	1,133
S31	TI (("3rd world" W0 (countr* or nation or nations or econom*))) OR AB (("3rd world" W0 (countr* or nation or nations or econom*)))	9
S32	TI (("third world" W0 (countr* or nation or nations or econom*))) OR AB (("third world" W0 (countr* or nation or nations or econom*)))	1,004
S33	TI ((LAMI W0 (countr* or nation or nations or econom*))) OR AB ((LAMI W0 (countr* or nation or nations or econom*)))	42
S34	TI ((LMIC W0 (countr* or nation or nations or econom*))) OR AB ((LMIC W0 (countr* or nation or nations or econom*)))	65
S35	TI (("poor income" W0 (countr* or nation or nations or econom*))) OR AB (("poor income" W0 (countr* or nation or nations or econom*)))	4
S36	TI (("low* income" W0 (countr* or nation or nations or econom*))) OR AB (("low* income" W0 (countr* or nation or nations or econom*)))	7,091
S37	TI (("less* developed" W0 (countr* or nation or nations or econom*))) OR AB (("less* developed" W0 (countr* or nation or nations or econom*)))	1,288
S38	TI (("least developed" W0 (countr* or nation or nations or econom*))) OR AB (("least developed" W0 (countr* or nation or nations or econom*)))	226
S39	(South or Southern) W0 Asia*	48,539
S40	("South east*" or Southeast) W0 Asia*	19,045
S41	West* W0 Asia*	2,259
S42	(Middle or Far) W0 East*	36,396
S43	Africa*	374,110
S44	(Latin or Central or South) W0 America*	61,439
S45	Caribbean* or "West Indies"	25,953
S46	East* W0 Europe*	10,266
S47	Afghan* or "Burkina Faso*" or Burundi* or Chad* or Eritrea* or Ethiopia* or Gambia* or Guinea* or "Guinea Bissau*" or Haiti* or Liberia* or Madagasc* or Malagasy or Malawi* or Mali or Mali's or Malian or Mozambi* or Niger* or Rwanda* or "Sierra Leone*" or Somalia* or Sudan* or Tajik* or Togo* or Uganda* or Yemen*	373,866
S48	"Central African Republic*" or "Democratic Republic of Congo" or DRC or Congo* or "North* Korea*" or "Democratic People's Republic of Korea*" or "South* Sudan*" or Syria* or Angola* or Algeria* or Bangladesh* or Benin* or Bhutan* or Bolivia* or "Cabo Verd*" or "Cape Verd*" or "Upper Volta*" or Cambodia* or Cameroon* or Comoros or Comorian or "Cote d'Ivoire" or "Ivory Coast" or Ivorian or Djibouti* or Egypt* or "El Salvador*" or Eswatini* or Swazi* or Ghana* or Hondura* or India* or Kenya* or Kiribati* or Kyrgyz* or Lao* or Lesotho or Mosotho or Basotho or Mauritan* or Micronesia* or Moldov* or Mongolia* or Morocc*	838,259
S49	Myanmar* or Burma* or Burmese* or Nepal* or Nicaragua* or "Papua New Guinea*" or PNG* or Philippines* or Pakistan* or "Sao Tome*" or Principe* or Senegal* or "Solomon Island*" or "Sri Lanka*" or Tanzania* or "Timor-Leste*" or Tunisia* or Ukrain* or Uzbek* or Vanuatu* or Vietnam* or "West Bank*" or Gaza* or Palestin* or Zambia* or Zimbabwe*	269,850

S50	Albania* or Samoa* or Argentin* or Armenia* or Azerbaijan* or Belarus* or Belize* or Bosnia* or Herzegovina* or Botswana* or Brazil* or Bulgaria* or China* or Chinese* or Colombia* or "Costa Rica*" or Cuba* or Dominica* or "Dominican Republic*" or "Equatorial Guinea*" or Ecuador* or Fiji* or Gabon* or Georgia* or Grenada* or Guyana* or Guatemala*	2,600,565
S51	Indonesia* or Iran* or Iraq* or Jamaica* or Jordan* or Kazakh* or Kosovo* or Lebanon* or Lebanese* or Libya* or Malaysia* or Maldives* or "Marshall Island*" or Mexic* or Montenegro* or Namibia* or Macedonia* or Paraguay* or Peru* or "Russian Federation" or Russia* or USSR or "Soviet Union" or Serbia* or "South* Africa*" or "St Lucia*" or "St Vincent*" or Grenadine* or Surinam* or Thai* or Tonga* or Turkey* or Turkmenistan* or Tuvalu* or Venezuela	1,361,060
S52	S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49 OR S50 OR S51	5,392,583
S53		
S12 AND S26 AND S52		567

Appendix E: World Bank Classification of Economies 2020

World Bank list of economies (June 2020)

(Bold indicates a change of classification)

	<i>Economy</i>	<i>Code</i>	<i>Region</i>	<i>Income group</i>
1	Afghanistan	AFG	South Asia	Low income
2	Albania	ALB	Europe & Central Asia	Upper middle income
3	Algeria	DZA	Middle East & North Africa	Lower middle income
4	American Samoa	ASM	East Asia & Pacific	Upper middle income
5	Andorra	AND	Europe & Central Asia	High income
6	Angola	AGO	Sub-Saharan Africa	Lower middle income
7	Antigua and Barbuda	ATG	Latin America & Caribbean	High income
8	Argentina	ARG	Latin America & Caribbean	Upper middle income
9	Armenia	ARM	Europe & Central Asia	Upper middle income
10	Aruba	ABW	Latin America & Caribbean	High income
11	Australia	AUS	East Asia & Pacific	High income
12	Austria	AUT	Europe & Central Asia	High income
13	Azerbaijan	AZE	Europe & Central Asia	Upper middle income
14	Bahamas, The	BHS	Latin America & Caribbean	High income
15	Bahrain	BHR	Middle East & North Africa	High income
16	Bangladesh	BGD	South Asia	Lower middle income
17	Barbados	BRB	Latin America & Caribbean	High income
18	Belarus	BLR	Europe & Central Asia	Upper middle income
19	Belgium	BEL	Europe & Central Asia	High income
20	Belize	BLZ	Latin America & Caribbean	Upper middle income
21	Benin	BEN	Sub-Saharan Africa	Lower middle income
22	Bermuda	BMU	North America	High income
23	Bhutan	BTN	South Asia	Lower middle income
24	Bolivia	BOL	Latin America & Caribbean	Lower middle income
25	Bosnia and Herzegovina	BIH	Europe & Central Asia	Upper middle income
26	Botswana	BWA	Sub-Saharan Africa	Upper middle income
27	Brazil	BRA	Latin America & Caribbean	Upper middle income
28	British Virgin Islands	VGB	Latin America & Caribbean	High income
29	Brunei Darussalam	BRN	East Asia & Pacific	High income
30	Bulgaria	BGR	Europe & Central Asia	Upper middle income
31	Burkina Faso	BFA	Sub-Saharan Africa	Low income
32	Burundi	BDI	Sub-Saharan Africa	Low income
33	Cabo Verde	CPV	Sub-Saharan Africa	Lower middle income
34	Cambodia	KHM	East Asia & Pacific	Lower middle income
35	Cameroon	CMR	Sub-Saharan Africa	Lower middle income
36	Canada	CAN	North America	High income
37	Cayman Islands	CYM	Latin America & Caribbean	High income
38	Central African Republic	CAF	Sub-Saharan Africa	Low income
39	Chad	TCD	Sub-Saharan Africa	Low income
40	Channel Islands	CHI	Europe & Central Asia	High income
41	Chile	CHL	Latin America & Caribbean	High income
42	China	CHN	East Asia & Pacific	Upper middle income
43	Colombia	COL	Latin America & Caribbean	Upper middle income
44	Comoros	COM	Sub-Saharan Africa	Lower middle income
45	Congo, Dem. Rep.	COD	Sub-Saharan Africa	Low income
46	Congo, Rep.	COG	Sub-Saharan Africa	Lower middle income
47	Costa Rica	CRI	Latin America & Caribbean	Upper middle income
48	Côte d'Ivoire	CIV	Sub-Saharan Africa	Lower middle income
49	Croatia	HRV	Europe & Central Asia	High income

50	Cuba	CUB	Latin America & Caribbean	Upper middle income
51	Curaçao	CUW	Latin America & Caribbean	High income
52	Cyprus	CYP	Europe & Central Asia	High income
53	Czech Republic	CZE	Europe & Central Asia	High income
54	Denmark	DNK	Europe & Central Asia	High income
55	Djibouti	DJI	Middle East & North Africa	Lower middle income
56	Dominica	DMA	Latin America & Caribbean	Upper middle income
57	Dominican Republic	DOM	Latin America & Caribbean	Upper middle income
58	Ecuador	ECU	Latin America & Caribbean	Upper middle income
59	Egypt, Arab Rep.	EGY	Middle East & North Africa	Lower middle income
60	El Salvador	SLV	Latin America & Caribbean	Lower middle income
61	Equatorial Guinea	GNQ	Sub-Saharan Africa	Upper middle income
62	Eritrea	ERI	Sub-Saharan Africa	Low income
63	Estonia	EST	Europe & Central Asia	High income
64	Eswatini	SWZ	Sub-Saharan Africa	Lower middle income
65	Ethiopia	ETH	Sub-Saharan Africa	Low income
66	Faroe Islands	FRO	Europe & Central Asia	High income
67	Fiji	FJI	East Asia & Pacific	Upper middle income
68	Finland	FIN	Europe & Central Asia	High income
69	France	FRA	Europe & Central Asia	High income
70	French Polynesia	PYF	East Asia & Pacific	High income
71	Gabon	GAB	Sub-Saharan Africa	Upper middle income
72	Gambia, The	GMB	Sub-Saharan Africa	Low income
73	Georgia	GEO	Europe & Central Asia	Upper middle income
74	Germany	DEU	Europe & Central Asia	High income
75	Ghana	GHA	Sub-Saharan Africa	Lower middle income
76	Gibraltar	GIB	Europe & Central Asia	High income
77	Greece	GRC	Europe & Central Asia	High income
78	Greenland	GRL	Europe & Central Asia	High income
79	Grenada	GRD	Latin America & Caribbean	Upper middle income
80	Guam	GUM	East Asia & Pacific	High income
81	Guatemala	GTM	Latin America & Caribbean	Upper middle income
82	Guinea	GIN	Sub-Saharan Africa	Low income
83	Guinea-Bissau	GNB	Sub-Saharan Africa	Low income
84	Guyana	GUY	Latin America & Caribbean	Upper middle income
85	Haiti	HTI	Latin America & Caribbean	Low income
86	Honduras	HND	Latin America & Caribbean	Lower middle income
87	Hong Kong SAR, China	HKG	East Asia & Pacific	High income
88	Hungary	HUN	Europe & Central Asia	High income
89	Iceland	ISL	Europe & Central Asia	High income
90	India	IND	South Asia	Lower middle income
91	Indonesia	IDN	East Asia & Pacific	Upper middle income
92	Iran, Islamic Rep.	IRN	Middle East & North Africa	Upper middle income
93	Iraq	IRQ	Middle East & North Africa	Upper middle income
94	Ireland	IRL	Europe & Central Asia	High income
95	Isle of Man	IMN	Europe & Central Asia	High income
96	Israel	ISR	Middle East & North Africa	High income
97	Italy	ITA	Europe & Central Asia	High income
98	Jamaica	JAM	Latin America & Caribbean	Upper middle income
99	Japan	JPN	East Asia & Pacific	High income
100	Jordan	JOR	Middle East & North Africa	Upper middle income
101	Kazakhstan	KAZ	Europe & Central Asia	Upper middle income
102	Kenya	KEN	Sub-Saharan Africa	Lower middle income
103	Kiribati	KIR	East Asia & Pacific	Lower middle income
104	Korea, Dem. People's Rep.	PRK	East Asia & Pacific	Low income
105	Korea, Rep.	KOR	East Asia & Pacific	High income
106	Kosovo	XKX	Europe & Central Asia	Upper middle income
107	Kuwait	KWT	Middle East & North Africa	High income
108	Kyrgyz Republic	KGZ	Europe & Central Asia	Lower middle income
109	Lao PDR	LAO	East Asia & Pacific	Lower middle income
110	Latvia	LVA	Europe & Central Asia	High income
111	Lebanon	LBN	Middle East & North Africa	Upper middle income
112	Lesotho	LSO	Sub-Saharan Africa	Lower middle income

113	Liberia	LBR	Sub-Saharan Africa	Low income
114	Libya	LBY	Middle East & North Africa	Upper middle income
115	Liechtenstein	LIE	Europe & Central Asia	High income
116	Lithuania	LTU	Europe & Central Asia	High income
117	Luxembourg	LUX	Europe & Central Asia	High income
118	Macao SAR, China	MAC	East Asia & Pacific	High income
119	Madagascar	MDG	Sub-Saharan Africa	Low income
120	Malawi	MWI	Sub-Saharan Africa	Low income
121	Malaysia	MYS	East Asia & Pacific	Upper middle income
122	Maldives	MDV	South Asia	Upper middle income
123	Mali	MLI	Sub-Saharan Africa	Low income
124	Malta	MLT	Middle East & North Africa	High income
125	Marshall Islands	MHL	East Asia & Pacific	Upper middle income
126	Mauritania	MRT	Sub-Saharan Africa	Lower middle income
127	Mauritius	MUS	Sub-Saharan Africa	High income
128	Mexico	MEX	Latin America & Caribbean	Upper middle income
129	Micronesia, Fed. Sts.	FSM	East Asia & Pacific	Lower middle income
130	Moldova	MDA	Europe & Central Asia	Lower middle income
131	Monaco	MCO	Europe & Central Asia	High income
132	Mongolia	MNG	East Asia & Pacific	Lower middle income
133	Montenegro	MNE	Europe & Central Asia	Upper middle income
134	Morocco	MAR	Middle East & North Africa	Lower middle income
135	Mozambique	MOZ	Sub-Saharan Africa	Low income
136	Myanmar	MMR	East Asia & Pacific	Lower middle income
137	Namibia	NAM	Sub-Saharan Africa	Upper middle income
138	Nauru	NRU	East Asia & Pacific	High income
139	Nepal	NPL	South Asia	Lower middle income
140	Netherlands	NLD	Europe & Central Asia	High income
141	New Caledonia	NCL	East Asia & Pacific	High income
142	New Zealand	NZL	East Asia & Pacific	High income
143	Nicaragua	NIC	Latin America & Caribbean	Lower middle income
144	Niger	NER	Sub-Saharan Africa	Low income
145	Nigeria	NGA	Sub-Saharan Africa	Lower middle income
146	North Macedonia	MKD	Europe & Central Asia	Upper middle income
147	Northern Mariana Islands	MNP	East Asia & Pacific	High income
148	Norway	NOR	Europe & Central Asia	High income
149	Oman	OMN	Middle East & North Africa	High income
150	Pakistan	PAK	South Asia	Lower middle income
151	Palau	PLW	East Asia & Pacific	High income
152	Panama	PAN	Latin America & Caribbean	High income
153	Papua New Guinea	PNG	East Asia & Pacific	Lower middle income
154	Paraguay	PRY	Latin America & Caribbean	Upper middle income
155	Peru	PER	Latin America & Caribbean	Upper middle income
156	Philippines	PHL	East Asia & Pacific	Lower middle income
157	Poland	POL	Europe & Central Asia	High income
158	Portugal	PRT	Europe & Central Asia	High income
159	Puerto Rico	PRI	Latin America & Caribbean	High income
160	Qatar	QAT	Middle East & North Africa	High income
161	Romania	ROU	Europe & Central Asia	High income
162	Russian Federation	RUS	Europe & Central Asia	Upper middle income
163	Rwanda	RWA	Sub-Saharan Africa	Low income
164	Samoa	WSM	East Asia & Pacific	Upper middle income
165	San Marino	SMR	Europe & Central Asia	High income
166	São Tomé and Príncipe	STP	Sub-Saharan Africa	Lower middle income
167	Saudi Arabia	SAU	Middle East & North Africa	High income
168	Senegal	SEN	Sub-Saharan Africa	Lower middle income
169	Serbia	SRB	Europe & Central Asia	Upper middle income
170	Seychelles	SYC	Sub-Saharan Africa	High income
171	Sierra Leone	SLE	Sub-Saharan Africa	Low income
172	Singapore	SGP	East Asia & Pacific	High income
173	Sint Maarten (Dutch part)	SXM	Latin America & Caribbean	High income
174	Slovak Republic	SVK	Europe & Central Asia	High income

175	Slovenia	SVN	Europe & Central Asia	High income
176	Solomon Islands	SLB	East Asia & Pacific	Lower middle income
177	Somalia	SOM	Sub-Saharan Africa	Low income
178	South Africa	ZAF	Sub-Saharan Africa	Upper middle income
179	South Sudan	SSD	Sub-Saharan Africa	Low income
180	Spain	ESP	Europe & Central Asia	High income
181	Sri Lanka	LKA	South Asia	Lower middle income
182	St. Kitts and Nevis	KNA	Latin America & Caribbean	High income
183	St. Lucia	LCA	Latin America & Caribbean	Upper middle income
184	St. Martin (French part)	MAF	Latin America & Caribbean	High income
185	St. Vincent and the Grenadines	VCT	Latin America & Caribbean	Upper middle income
186	Sudan	SDN	Sub-Saharan Africa	Low income
187	Suriname	SUR	Latin America & Caribbean	Upper middle income
188	Sweden	SWE	Europe & Central Asia	High income
189	Switzerland	CHE	Europe & Central Asia	High income
190	Syrian Arab Republic	SYR	Middle East & North Africa	Low income
191	Taiwan, China	TWN	East Asia & Pacific	High income
192	Tajikistan	TJK	Europe & Central Asia	Low income
193	Tanzania	TZA	Sub-Saharan Africa	Lower middle income
194	Thailand	THA	East Asia & Pacific	Upper middle income
195	Timor-Leste	TLS	East Asia & Pacific	Lower middle income
196	Togo	TGO	Sub-Saharan Africa	Low income
197	Tonga	TON	East Asia & Pacific	Upper middle income
198	Trinidad and Tobago	TTO	Latin America & Caribbean	High income
199	Tunisia	TUN	Middle East & North Africa	Lower middle income
200	Turkey	TUR	Europe & Central Asia	Upper middle income
201	Turkmenistan	TKM	Europe & Central Asia	Upper middle income
202	Turks and Caicos Islands	TCA	Latin America & Caribbean	High income
203	Tuvalu	TUV	East Asia & Pacific	Upper middle income
204	Uganda	UGA	Sub-Saharan Africa	Low income
205	Ukraine	UKR	Europe & Central Asia	Lower middle income
206	United Arab Emirates	ARE	Middle East & North Africa	High income
207	United Kingdom	GBR	Europe & Central Asia	High income
208	United States	USA	North America	High income
209	Uruguay	URY	Latin America & Caribbean	High income
210	Uzbekistan	UZB	Europe & Central Asia	Lower middle income
211	Vanuatu	VUT	East Asia & Pacific	Lower middle income
212	Venezuela, RB	VEN	Latin America & Caribbean	Upper middle income
213	Vietnam	VNM	East Asia & Pacific	Lower middle income
214	Virgin Islands (U.S.)	VIR	Latin America & Caribbean	High income
215	West Bank and Gaza	PSE	Middle East & North Africa	Lower middle income
216	Yemen, Rep.	YEM	Middle East & North Africa	Low income
217	Zambia	ZMB	Sub-Saharan Africa	Lower middle income
218	Zimbabwe	ZWE	Sub-Saharan Africa	Lower middle income

Appendix F: Proforma for data extraction

[illegible]

Prevalence for burnout subscales (if used)										
Definition used for high/moderate/low on EE subscale	Prevalence for Emotional exhaustion % (EE)	Mean score EE	Definition used for high/moderate/low on DP subscale	Prevalence for Depersonalisation % (DP)	Mean score DP	Definition used for high/moderate/low on PA subscale	Prevalence for Professional accomplishment % (PA)	Mean score PA	Disengagement if measured	Percentages of those scoring high on just one subscale, two sub-scales or all three sub-scales - if reported

Statistically significant associated factors and direction of association															
Age	Gender	Marital status	Dependents	Smoking	Alcohol intake	Level of education	Work setting	Workload incl overtime	Pay	Conflict (at work or work-family)	Work resources	Work tasks e.g. admin burden	Supervisor support	Years in practice	Other

Risk of Bias Tool										
Was the study's target population a close representation of the population in relation to relevant variables?	Was sampling frame a true representation?	Was random selection used to select sample?	Was the likelihood of nonresponse bias minimal?	Were data collected directly from subjects?	Was an acceptable case definition of burnout used?	Was the method that diagnosed burnout shown to have validity and reliability?	Was the same mode of data collection used for all subjects?	Was the length of the shortest prevalence period for the parameter of interest appropriate?	Were the numerator(s) and denominator(s) for the parameter of interest appropriate and clearly reported?	Total score

Appendix G: Risk of bias tool

Name of author(s): _____ Year of publication: _____

Name of paper/study:-

This tool is designed to assess the risk of bias in population-based prevalence studies. Please read the additional notes for each item when initially using the tool. Note: If there is insufficient information in the article to permit a judgement for a particular item, please answer **No (HIGH RISK)** for that particular item.

Risk of bias item	Criteria for answers (please circle one option)	Additional notes and examples
External Validity		
1. Was the study's target population a <u>close representation</u> of the national population in relation to relevant variables, e.g. age, sex, occupation?	• Yes (LOW RISK): The study's target population was a <u>close</u> representation of the national population. • No (HIGH RISK): The study's target population was clearly <u>NOT</u> representative of the national population.	The target population refers to the group of people or entities to which the results of the study will be generalised. Examples: • The study was a national health survey of people 15 years and over and the sample was drawn from a list that included all individuals in the population aged 15 years and over. The answer is: Yes (LOW RISK). • The study was conducted in one province only, and it is not clear if this was representative of the national population. The answer is: No (HIGH RISK). • The study was undertaken in one village only and it is clear this was not representative of the national population. The answer is: No (HIGH RISK).
2. Was the sampling frame a <u>true or close representation</u> of the target population?	• Yes (LOW RISK): The sampling frame was a <u>true or close</u> representation of the target population. • No (HIGH RISK): The sampling frame was NOT a <u>true or close</u> representation of the target population.	The sampling frame is a list of the sampling units in the target population and the study sample is drawn from this list. Examples: • The sampling frame was a list of almost every individual within the target population. The answer is: Yes (LOW RISK). • The cluster sampling method was used, and the sample of clusters/villages was drawn from a list of all villages in the target population. The answer is: Yes (LOW RISK). • The sampling frame was a list of just one particular ethnic group within the overall target population, which comprised many groups. The answer is: No (HIGH RISK).

3. Was some form of <u>random selection</u> used to select the sample, OR was a census undertaken?	• Yes (LOW RISK): A census was undertaken, OR some form of random selection was used to select the sample (e.g. simple random sampling, stratified random sampling, cluster sampling, systematic sampling). • No (HIGH RISK): A census was NOT undertaken, AND some form of random selection was NOT used to select the sample.	A census collects information from every unit in the sampling frame. In a survey, only part of the sampling frame is sampled. In these instances, random selection of the sample helps minimise study bias. Examples: • The sample was selected using simple random sampling. The answer is: Yes (LOW RISK). • The target population was the village and every person in the village was sampled. The answer is: Yes (LOW RISK). • The nearest villages to the capital city were selected in order to save on the cost of fuel. The answer is: No (HIGH RISK).
4. Was the likelihood of <u>non-response bias minimal</u> ?	• Yes (LOW RISK): The response rate for the study was $\geq 75\%$, OR an analysis was performed that showed no significant difference in relevant demographic characteristics between responders and nonresponders • No (HIGH RISK): The response rate was $< 75\%$, and if any analysis comparing responders and non-responders was done, it showed a significant difference in relevant demographic characteristics between responders and non-responders.	Examples: • The response rate was 68%; however, the researchers did an analysis and found no significant difference between responders and non-responders in terms of age, sex, occupation, and socioeconomic status. The answer is: Yes (LOW RISK). • The response rate was 65% and the researchers did NOT carry out an analysis to compare relevant demographic characteristics between responders and non-responders. The answer is: No (HIGH RISK). • The response rate was 69% and the researchers did an analysis and found a significant difference in age, sex and socio-economic status between responders and non-responders. The answer is: No (HIGH RISK).

Internal Validity		
5. Were data collected <u>directly from the subjects</u> (as opposed to a proxy)?	• Yes (LOW RISK): All data were collected directly from the subjects. • No (HIGH RISK): In some instances, data were collected from a proxy.	A proxy is a representative of the subject. Examples: • All eligible subjects in the household were interviewed separately. The answer is: Yes (LOW RISK). • A representative of the household was interviewed and questioned about the presence of low back pain in each household member. The answer is: No (HIGH RISK).
6. Was an acceptable case definition used in the study?	• Yes (LOW RISK): An acceptable case definition was used. • No (HIGH RISK): An acceptable case definition was <u>NOT</u> used.	• For a study on low back pain, the following case definition was used: "Low back pain is defined as activity-limiting pain lasting more than one day in the area on the posterior aspect of the body from the bottom of the 12th rib to the lower gluteal folds." The answer is: Yes (LOW RISK). • For a study on back pain, there was no description of the specific anatomical location „back" referred to. The answer is: No (HIGH RISK). • For a study on osteoarthritis, the following case definition was used: "Symptomatic osteoarthritis of the hip or knee, radiologically confirmed as Kellgren-Lawrence grade 2-4". The answer is: LOW RISK.

7. Was the study instrument that measured the parameter of interest (e.g. prevalence of low back pain) shown to have <u>reliability and validity (if necessary)</u> ?	• Yes (LOW RISK): The study instrument had been shown to have reliability and validity (if this was necessary), e.g. test-retest, piloting, validation in a previous study, etc. • No (HIGH RISK): The study instrument had <u>NOT</u> been shown to have reliability or validity (if this was necessary).	• The authors used the COPCORD questionnaire, which had previously been validated. They also tested the inter-rater reliability of the questionnaire. The answer is: Yes (LOW RISK). • The authors developed their own questionnaire and did not test this for validity or reliability. The answer is: No (HIGH RISK).
8. Was the <u>same mode of data collection</u> used for all subjects?	• Yes (LOW RISK): The same mode of data collection was used for all subjects. • No (HIGH RISK): The same mode of data collection was NOT used for all subjects.	The mode of data collection is the method used for collecting information from the subjects. The most common modes are face-to-face interviews, telephone interviews and self-administered questionnaires. Examples: • All eligible subjects had a face-to-face interview. The answer is: Yes (LOW RISK). • Some subjects were interviewed over the telephone, and some filled in postal questionnaires. The answer is: No (HIGH RISK).
9. Was the <u>length of the shortest prevalence period</u> for the parameter of interest appropriate?	• Yes (LOW RISK): The shortest prevalence period for the parameter of interest was appropriate (e.g. point prevalence, one-week prevalence, one-year prevalence). • No (HIGH RISK): The shortest prevalence period for the parameter of interest was not appropriate (e.g. lifetime prevalence)	The prevalence period is the period that the subject is asked about e.g. "Have you experienced low back pain over the previous year?" In this example, the prevalence period is one year. The longer the prevalence period, the greater the likelihood of the subject forgetting if they experienced the symptom of interest (e.g. low back pain). Examples: • Subjects were asked about pain over the past week. The answer is: Yes (LOW RISK). • Subjects were only asked about pain over the past three years. The answer is: No (HIGH RISK).
10. Were the <u>numerator(s) and denominator(s)</u> for the parameter of interest appropriate?	• Yes (LOW RISK): The paper presented appropriate numerator were no errors in the reporting of denominator(s) for the prevalence of Yes (LOW RISK). low back both men • No (HIGH RISK): The paper and present numerator(s) AND population. denominator(s) for one or more of these were	There may be errors in the calculation and/or reporting of the and/or denominator. Examples: numerator(s) AND □ There the numerator(s) AND denominator(s) for the parameter of low back pain. The answer is: of interest (e.g. the prevalence pain). □ In reporting the overall prevalence of low back pain (in women), the authors accidentally used the population of did women as the denominator rather than the combined the parameter The answer is: No (HIGH RISK). of interest but inappropriate.
11. Summary item on the overall risk of study bias		
• LOW RISK OF BIAS: Further research is <u>very unlikely</u> to change our confidence in the estimate. • MODERATE RISK OF BIAS: Further research is <u>likely</u> to have an important impact on our confidence in the estimate and may change the estimate.		
□ HIGH RISK OF BIAS: Further research is <u>very likely</u> to have an important impact on our confidence in the estimate and is likely to change the estimate. □		

Appendix H: Risk of bias results table

First Author and year of publication	Was the study's target population a close representation of the population in relation to relevant variables?	Was sampling frame a true representation?	Was random selection used to select sample?	Was the likelihood of nonresponse bias minimal?	Were data collected directly from subjects?	Was an acceptable case definition of burnout used?	Was the method that diagnosed burnout shown to have validity and reliability?	Was the same mode of data collection used for all subjects?	Was the length of the shortest prevalence period for the parameter of interest appropriate?	Were the numerator(s) and denominator(s) for the parameter of interest appropriate and clearly reported?	Total score
ID01 Putnik, 2011	0	0	0	0	1	1	1	1	1	1	6
ID03 Mandengue, 2017	0	0	1	0	1	1	1	1	1	1	7
ID04 Lopez-Leon, 2007	1	1	1	1	1	1	1	1	1	1	10
ID05 Lesic, 2009	0	0	0	0	1	1	1	1	1	1	6
ID06 Kotb, 2014	0	0	1	0	1	1	1	1	1	1	7
ID07 Kosan, 2019	1	1	1	1	1	1	1	1	1	1	10
ID08 Gan, 2019	0	1	1	1	1	1	1	1	1	1	9
ID09 Charoentanyarak 2020	0	0	0	0	1	1	1	1	1	1	6
ID10 Cetina-Tabares 2006	0	0	0	1	1	1	1	1	1	1	7
ID12 Stanetić 2013	0	1	0	0	1	1	1	1	1	1	7
ID13 Soler 2008	0	0	0	0	1	1	1	1	1	1	6
*ID14 Aranda 2004	0	1	1	0	1	1	1	1	1	1	8
ID15 Aranda-Beltran, 2005	0	0	1	1	1	1	1	1	1	1	8
ID17 Al Dabbagh 2019	0	1	0	1	1	1	1	1	1	1	8
ID18 Ahmadpanah 2015	0	0	0	0	1	1	1	1	1	1	6
ID19 Aguilera 2010	0	1	1	1	1	1	1	1	1	1	9
ID02 Račić 2019	0	1	0	1	1	0	1	1	1	1	7
ID56 Rossouw 2014											7
ID20 Engelbrecht 2008	0	1	1	1	1	1	1	1	1	1	9
ID21 Hu 2015	0	0	0	1	1	1	1	1	1	1	7
ID23 Alshawish 2020	0	1	0	0	1	1	1	1	1	1	7
ID24 das Merces 2017	0	1	0	0	1	1	1	1	1	1	7

ID25 das Mercés 2016	0	0	1	1	1	1	1	1	1	1	1	8
ID27 Ramos 2019	0	0	0	0	1	1	1	1	1	1	1	6
ID28 das Mercés 2016	0	1	0	1	1	1	1	1	1	1	1	8
ID29 Lorenz 2018	0	1	1	0	1	1	1	1	1	1	1	8
ID30 Holmes 2014	0	1	1	1	1	1	1	1	1	1	1	9
*ID31 das Mercés 2020	0	0	0	1	1	1	1	1	1	1	1	7
ID32 Silveira 2014	0	0	1	1	1	1	1	1	1	1	1	8
ID33 da Silva 2008	0	0	1	1	1	1	1	1	1	1	1	8
ID34 Selamu 2019	0	0	0	1	1	1	1	1	1	1	1	7
ID35 Hernández 2003	0	0	0	1	1	1	1	1	1	1	1	7
ID36 Ran 2020	0	0	0	1	1	1	1	1	1	1	1	7
ID37 Pinheiro 2020	0	0	0	0	1	1	1	1	1	1	1	6
ID38 Muliira 2016	0	1	1	1	1	1	1	1	1	1	1	9
ID39 Mota 2014	0	0	0	1	1	1	1	1	1	1	1	7
ID40 Martins 2014	0	1	1	0	1	1	1	1	1	1	1	8
ID41 Mao 2020	0	0	0	1	1	1	1	1	1	1	1	7
ID42 Malakouti 2011	0	1	1	1	1	1	1	1	1	1	1	9
ID43 Lima 2018	0	1	1	1	1	1	1	1	1	1	0	8
ID44 Li 2019	0	1	1	1	1	1	1	1	1	1	1	9
ID45 Kruse 2009	0	0	1	1	1	1	1	1	1	1	1	8
ID46 Hernández-Vargas 2009	0	0	0	1	1	1	1	1	1	1	1	7
ID47 Maciel 2018	0	1	0	0	1	1	1	1	1	1	1	7
ID48 Calgan 2011	0	0	1	1	1	1	1	1	1	1	1	8
ID50 Xu 2020	0	1	1	1	1	1	1	1	1	1	1	9
ID51 Wang 2020	1	1	1	1	1	1	1	1	1	1	1	10
ID52 Tomaz 2020	0	0	0	0	1	1	1	1	1	1	1	6
ID53 de Souza Filho 2019	0	1	1	0	1	1	1	1	1	1	1	8
ID54 Bijari 2016	0	1	1	1	1	1	1	1	1	1	1	9
ID55 Amiri 2016	0	0	1	0	1	1	1	1	1	1	1	7
U01 Çevik and Ungan 2021 (Covid)	1	1	1	0	1	1	1	1	1	1	1	9
U02 da Silva 2021	0	1	1	1	1	1	1	1	1	1	1	9
U03 Garcia 2021 (pre-Covid)	0	1	0	1	1	1	1	1	1	1	1	8

U04 Lu 2020 (pre-Covid)	1	1	1	1	1	1	1	1	1	1	1	10
U06 Okuyan 2021 (Covid)	1	0	0	0	1	1	1	1	1	1	1	7
U07 Pulagam 2021	0	1	1	1	1	1	1	1	1	1	1	9
U08 Seluch 2021 (Covid)	0	0	0	0	1	1	1	1	1	1	1	6
U09 Yan 2021	0	1	1	0	1	1	1	1	1	1	1	8
U10 Zhang 2021	0	1	1	1	1	1	1	1	1	1	1	9

WORK STRESS QUESTIONNAIRE

We are interested in surveying fully qualified (i.e., not medical students) generalist physicians working in a community or primary care setting, or those who are specialised in family medicine.

Participation in this study is voluntary and the information is anonymised and will be kept completely confidential. Data will be stored securely on password protected Keele University servers.

If you wish to withdraw once you have started the questionnaire you can choose not to finish, however it will not be possible to withdraw once you have submitted all of your answers.

Further information about the study aims and objectives and the possible benefits and risks of taking part can be accessed by clicking on the link below. Please read this information before taking part.

[Link to Information sheet](#)

Alternatively, any questions can be emailed to the lead researcher Dr Tanya Wright, at t.r.wright@keele.ac.uk

Ethical approval has been granted by ... *To include IRBs here*

This questionnaire is divided into 5 sections each taking only a few minutes to complete. The first is about your specific work situation, the second is about your workload, the third is about possible factors associated with stress, the fourth is about how much stress you are experiencing in your work situation, and the fifth is about you as an individual.

The questionnaire will take approximately 10 - 15 minutes to complete.

Many thanks for your time and willingness to take part.

Consent Declaration

1. I understand that my participation is voluntary
☐ Yes
☐ No
2. I understand that this questionnaire is completely anonymous, and that all data is confidential and is stored securely in password protected files, and that this anonymised information may be re-used in the future by researchers from my country and overseas collaborators
☐ Yes
☐ No
3. I understand that I can withdraw from this research by not completing the questionnaire but that once it is completed it will not be possible to withdraw the information
☐ Yes
☐ No
4. I can confirm that I have read and understood the information leaflet
☐ Yes
☐ No
5. I agree to take part in this research
☐ Yes
☐ No

All the above questions are set as mandatory and if the answer to any of them is 'No' they cannot progress in the questionnaire. Instead, they see a page with the following message: Unfortunately, you will not be able to proceed with the survey unless you can confirm your understanding and consent to take part. You may either return to the previous consent declaration or withdraw from the survey.

They can then return to the consent page or if they click 'next' they are directed to the end page of the questionnaire which tells them they have finished.

SECTION 1 – these questions are about your specific work situation:

1. *What country do you currently work in?
 - ☐ Malaysia
 - ☐ Pakistan
 - ☐ Sri Lanka
 - ☐ Zambia
 - ☐ Uganda
 - ☐ South Africa

2. *What is your current work position/ job title?

3. How many years have you worked in your current position?
 - ☐ 0-5
 - ☐ 6-10
 - ☐ 11-15
 - ☐ 16-20
 - ☐ more than 20

4. How many years has it been since you completed undergraduate medical school?
 - ☐ 0-5
 - ☐ 6-10
 - ☐ 11-15
 - ☐ 16-20
 - ☐ 21-25
 - ☐ 26-30
 - ☐ 31-35
 - ☐ More than 35

5. *Are you currently working or on leave for example sick leave or maternity leave (Please choose 'currently working' if simply on holiday)?
 - ☐ Currently working
 - ☐ On sick leave
 - ☐ On maternity leave
 - ☐ Other

6. *If on leave, how long have you been on leave? *Only shows if answer from previous question is 'on leave'*

7. Which type of area do you work in?
 - ☐ Rural
 - ☐ Urban
 - ☐ Semi-urban
 - ☐ Combined rural and urban practice

8. How would you describe your workplace?

- ☐ Community based clinic
- ☐ Hospital based clinic
- ☐ Both
- ☐ Other

9. Please describe your employment (tick all that apply)

- ☐ Private practice
- ☐ Government employed
- ☐ NGO employed
- ☐ Private non-profit

10. *What sort of patients do you see?

- ☐ I only see patients with specific medical problems (specialist)
- ☐ At least some of my work involves seeing patients with any medical problem (generalist)

11. *What age of patients do you see?

- ☐ Patients of any age
- ☐ Patients in a specific age group for example: only children; only the over 65's

SECTION 2 – the following questions refer to your workload

12. How many **patients** do you see on average **each day**?

- ☐ Less than 15
- ☐ 15-25
- ☐ 26-40
- ☐ 41-50
- ☐ More than 50

13. How many **hours** do you **work** in an average or typical **week**?

- ☐ Less than 20
- ☐ 20-30
- ☐ 31-40
- ☐ 41-50
- ☐ More than 50

14. How many weekday **night shifts** do you work in an average or typical **month**? (A nightshift is defined as any part of the overnight period from 8 p.m. to 8 a.m. and may be either onsite shifts or standby/offsite)

- ☐ I don't work night shifts
- ☐ 1-4
- ☐ 5-8
- ☐ 9-12
- ☐ More than 12

15. How many **weekend calls/shifts** do you work in an average **3 month** period? (Any part of a weekend)

- ☐ I don't work weekends
- ☐ 1-3
- ☐ 4-6
- ☐ More than 6

16. Please tick all the additional duties that you have over and above your clinical duties.

- ☐ Management
- ☐ Teaching
- ☐ Administration
- ☐ Leadership
- ☐ Research
- ☐ No additional duties

17. Approximately how many hours a week do you spend on your additional (management/ teaching/ admin/leadership/research) duties? *What this question shows is dependent on answer to previous question*

18. Do you have a second paid job?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

19. If yes, please state how many hours per week is dedicated to this second job. *Only shows if answer yes to previous question*

20. Do you do additional unpaid voluntary work?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

21. If yes, please state how many hours per week is spent doing unpaid voluntary work. *Conditional - As question 19*

22. Approximately how long does it take you to travel to work?

23. How do you usually travel to work?

- ☐ Privately owned car
- ☐ Taxi
- ☐ Bus
- ☐ Motorbike
- ☐ Bicycle
- ☐ On foot
- ☐ Other

24. Do you ever have difficulty travelling to work?
Always/ often/ sometimes/ rarely/ never

25. Do you ever feel stressed at work?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

26. What single aspect of your work do you find the most stressful? *Conditional on answering yes to Q25*

- ☐ Workload
- ☐ Non-clinical duties
- ☐ Clinical duties
- ☐ Level of support
- ☐ Lack of adequate medical supplies and/or equipment
- ☐ Conflict at work
- ☐ Conflict between family and work responsibilities
- ☐ Inadequate salary
- ☐ Understaffing
- ☐ Other

27. What other aspects of your work do you find especially stressful?

28. In what ways do you cope with work stress? Please tick all that apply *Conditional on answering yes to Q25*

- ☐ Exercise
- ☐ Hobbies
- ☐ Voluntary work
- ☐ Socialising with family or friends
- ☐ Other

29. In your opinion what single change at work would make the biggest difference to your stress levels? *Conditional on Q25*

- ☐ Shorter work hours
- ☐ Better pay
- ☐ Fewer patients
- ☐ Fewer non-clinical responsibilities
- ☐ More support
- ☐ Clearly defined role and expectations
- ☐ Better educational opportunities
- ☐ Adequate medical supplies and/or equipment
- ☐ Better staffing levels
- ☐ Other

30. More generally, what do you think the biggest problems in your country are with regard to workplace stress for community physicians?

31. What are some possible solutions to workplace stress in your country?

SECTION 3 - Please answer the following questions by ticking the box indicating to what extent you agree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
My manager is supportive of me at work. Please leave blank if this is not applicable for your setting					
Work offers me opportunities for continuing professional education.					
We are often under-staffed at work.					
My work colleagues are not supportive of me.					
Family support helps me to cope with the pressure of work.					
The resources I need to carry out my duties are not always available.					
When I am stressed, my outside interests help me to cope					
I often think about leaving my job.					
My workload has increased during the covid-19 pandemic.					
Manager support helps me to deal with the pressures of work.					
My work and home responsibilities do not conflict.					
I have a clearly defined role at work.					
There is often conflict at work.					
The support of my colleagues helps me to cope with work stress.					
I am treated fairly at work.					
I often make decisions at work that I do not feel sufficiently competent to make.					
I have the freedom to make decisions in my workplace, such as how to structure my schedule					
I feel safe at work					

***SECTION 4** – The following questions are used to measure stress levels at work and refer to your feelings and attitudes during work (OLBI; Demerouti and Bakker, 2008)*

Instructions: Please indicate to what extent you agree with each of the following statements by selecting the number that corresponds with the statement.

	Strongly agree	Agree	Disagree	Strongly disagree
	1	2	3	4
I always find new and interesting aspects in my work				
*There are days when I feel tired before I arrive at work				
*It happens more and more often that I talk about my work in a negative way				
*After work, I tend to need more time than in the past to relax and feel better				
I can tolerate the pressure of my work very well				
*Lately, I tend to think less at work and do my job almost mechanically				
I find my work to be a positive challenge				
*During my work, I often feel emotionally drained				
*Over time, one can become disconnected from this type of work				
After working, I have enough energy for my leisure activities				
*Sometimes I feel sickened by my work tasks				
*After my work, I usually feel worn out and weary				
This is the only type of work that I can imagine myself doing				
Usually, I can manage the amount of my work well				
I feel more and more engaged in my work				
When I work, I usually feel energized				

*Demerouti, E., and Bakker, A.B. 2008. The Oldenburg Burnout Inventory: A good alternative to measure burnout and engagement. In *Handbook of stress and burnout in health care*, Edited by: Halbesleben, J.R.B. Hauppauge, NY: Nova Science. pp. 65-78

SECTION 5

And finally, some questions about you. These details allow us to analyse the responses to the questionnaire according to the types of people who respond. The information is confidential and will only be available to the research team. If you would prefer not to answer any of these questions, please just leave them blank.

1. What is your age group?

- ☐ 20-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-59
- ☐ 60+

2. What is your sex?

- ☐ Male
- ☐ Female
- ☐ Prefer not to answer

3. What is your marital status?

- ☐ Single
- ☐ Married
- ☐ Widowed
- ☐ Divorced
- ☐ Co-habiting
- ☐ Prefer not to answer

4. Do you have children?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

5. How many children do you have? *5 and 6 only show if answer to question 4 is yes*

6. What are the ages of your children?

7. Do you have any other dependents living with you?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

8. How many other dependents live with you? *Only shows if answer to question 7 is yes*

9. Do you suffer from one or more long-term illness?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

10. Are you the main carer/ care-taker for someone with a long-term illness?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

11. Have you ever been diagnosed with or treated for anxiety?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

12. Have you ever been diagnosed with or treated for depression?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

13. Do you drink alcohol regularly?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

14. Has your alcohol intake increased over the past year?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

15. Do you smoke tobacco?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

16. What is the highest educational level/ degree you have achieved?

- ☐ Bachelor's degree
- ☐ Postgraduate certificate
- ☐ Postgraduate diploma
- ☐ Master's degree
- ☐ PhD
- ☐ Other (Please state below)

17. Would you be willing to take part in an online interview to gather further information about your experiences of work stress?

☐ Yes

☐ No

Interviews will take approximately an hour of your time and can be arranged at a time that is convenient for you. If you agree to be contacted for an interview an information leaflet and consent form will be emailed to you. Your email address will only be used for the purposes of this research and will not be passed on to any third party.

If completing this questionnaire has raised any issues or concerns for you regarding the degree of work stress you are experiencing, we would advise you to contact a local health professional for help and advice.

POISE Semi-structured interview topic guide

The following list of topics is a *guide* for the POISE researcher conducting semi-structured interviews with primary care professionals. The selection of topics is based on a review of the literature, themes emerging from available in-country expertise and evidence, and discussions within the POISE team. This topic guide will be updated throughout the study, as is conventional in a mixed-method study with a sequential design. We anticipate these updates to the topic guide to be only minor amendments (e.g., adding a couple of sub-questions or an extra theme that emerges to be relevant as the POISE questionnaire findings become available).

Opening:

Make introductions, how are you, thank you for agreeing to take part, etc.

Explain purpose of interview and check participant has read and understood the PIL.

Confirm consent for interview, re-iterate confidentiality and confirm consent for recording.

Any questions before we start?

Topics	Questions	Prompts
Work/workload	Q1 Can you start by telling me a little bit about your work?	Prompts – hours, shifts, patients, clinical vs non-clinical work, if you had a magic wand what would you change about your work?
Motivation for career choice	Q2 Why did you choose to study medicine?	Prompts – any regrets; pressure from others; would you make the same choice again? Would you encourage your children to choose medicine – why or why not?
Values at work	Q3 What values are important to you in your work? Q4 How do you feel these values are shared by your managers/ the organisation you work for?	Prompts - values such as integrity, fairness, justice, accountability, trustworthiness. Are these also valued by your managers / employing organisations?
Support networks	Q5 Where does your main support come from?	Prompts – family? Colleagues? how supported do you feel? How important is this?

Stress at work	Q6 Can you tell me about a situation that you found stressful at work? Q7 Can you describe some of the other things that make work stressful? Q8 What do you understand by the term 'burnout'?	Prompts – why was it so stressful? how often do you feel stressed at work? Prompts – is burnout a term that you are familiar with? What do you think 'burnout' might refer to?
Coping with stress	Q9 How do you cope with these stressful situations? Or how do you see your colleagues coping with stress?	Prompts – family, recreation, alcohol, or other substances – maybe not you but colleagues?
Competency	Q10 Have there ever been occasions where you felt you were asked to do something that you did not feel competent to do? Tell me more about that... how did it make you feel?	Prompts – feeling out of your depth, describe a situation which you felt required skills that you do not feel you have? What did you do? Have you witnessed colleagues in this sort of situation?
Availability of resources	Q11 Tell me a little about the resources you have available to you?	Prompts – basic necessities like water or electricity; medical equipment; medical supplies; improvisation – you or colleagues, how does that impact on your work?
Professional development	Q12 Can you describe for me the opportunities that you have for professional development/ training/education?	Prompts - how important are these opportunities to you? How would you change things if you could? How necessary are these opportunities to your feeling of well-being at work?
Future plans	Q13 Tell me about your plans for the future?	Prompts – plans to leave medicine, plans to leave workplace or country, where do you see yourself in 5 years' time?
Conclusion	Is there anything else you would like to share? Do you have any questions for me?	How did you find the interview experience? What could I do to improve it?

Work Stress and Burnout Study

Keele University, United Kingdom, working in collaboration with the [insert partner institution]

Calling all family physicians and community-based general physicians



I am a PhD researcher and family physician, from Keele University, UK, working in collaboration with researchers at [insert partner institution], to investigate work stress and burnout in family physicians and general physicians working in primary care.

Burnout among healthcare professionals is a global issue but unfortunately, there is little known about the scale and impact of burnout in family physicians in low - and middle -income countries.

This study seeks to change that by asking physicians working in primary care in six low- and middle-income countries about their experiences of work and work stress.

If you would like further information about the study or to take part in the survey, please click the links below, or scan the QR codes

Thank you!

QR code for questionnaire Link to questionnaire

QR code for participant information sheet

Link for PIS

Ethical approval for this study has been granted by
Keele University research ethics committee MH210193
University of Malaya research ethics committee 022624-11341

Lead researcher: Dr Tanya Wright
Supervisor: Professor Toby Helliwell

email: t.r.wright@keele.ac.uk
email: t.helliwell@keele.ac.uk

Information Leaflet

Title of Project: An investigation into the extent, the associated factors, and the experience of family physician burnout in low- and middle- income countries

Name and Contact Details of Researcher(s): Dr Tanya Wright; t.r.wright@keele.ac.uk

Name and Contact Details of Supervisor: Professor Toby Helliwell;
t.helliwell@keele.ac.uk

REC Reference Numbers

Keele University FREC: MH-210193

Country specific REC reference number: (to be added once available)

1. Invitation

We would like to invite you to take part in our research study. Joining the study is entirely up to you. Before you decide we would like to give you more details and information on our research project, why the research is being done and what it would involve for you. Please feel free to talk to others about the study if you wish. Do contact us if anything is unclear or you would like further details.

I am a family physician by training, and I am currently undertaking a PhD at Keele University, researching the impact of work-related stress and burnout in family physicians working in low- and middle-income countries across the world. We are working in collaboration with [insert name] in the department of family medicine at the University of [insert name]. Your help will give us an idea of the problem in your country and common themes identified internationally will help us develop support for family physicians both in your country specifically and also internationally.

2. Research Summary

This study is concerned with work related stress and burnout which is important because high levels of stress can have consequences for health and well-being as well as work performance. We are seeking participants who should be generalist physicians working in primary care or physicians who are specialists in family medicine. You may be on leave from work for any reason (for example, sick leave or maternity leave), as long as you have not been on leave for more than 12 months. Participation in the research requires you to complete an online questionnaire which will take approximately 15 minutes of your time. Following that, if you are willing, there will also be an opportunity for you to take part in an online interview (online, or

by email or telephone whichever you prefer). The interview will take between 30 and 60 minutes of your time.

Facts about participation

3. What is the purpose of the research?

Work stress and burnout is known to be associated with high workloads, understaffed work environments and reduced resources. Globally there are significant healthcare worker shortages, with the regions of Africa and South-East Asia being most affected. There are also significant imbalances in global health spending which negatively affects the availability of health resources in lower income countries. These shortages, in both available staff and resources, may result in high levels of workplace stress for physicians with consequences for their own health and well-being.

Given the essential role of family physicians in meeting the World Health Organisation's goal of universal healthcare coverage, it is vital to understand the impact of work-related stress in this group of physicians, especially with the added burden of the current covid-19 pandemic on workloads and resources. We hope that this research will improve our understanding of the impact of occupational stress on family physicians in low- and middle- income countries and inform the development of appropriate support and interventions for those most affected.

4. Why have I been invited?

We are collaborating with leading family medicine researchers from your own country who will have identified you as someone who fulfils our criteria for the study. We need as many specialists in family medicine or generalist physicians working in the community as possible to complete the questionnaire and also to consider giving further consent to an interview. The more doctors that take part, the better understanding we will have, giving us the best evidence for how occupational stress impacts on family physician's lives.

5. Do I have to take part?

Taking part in this research is entirely voluntary. It is up to you to decide if you want to volunteer for the research. If you agree to complete the questionnaire you may complete it after reading this information sheet. Your consent will be sought at the beginning of the questionnaire and there is no further obligation once you have completed the questionnaire. However, you will have an opportunity at the end of the questionnaire to let us know if you are also willing to be interviewed. We will then email you a second consent form which you must complete and return to us (dated xxx, version number, xxx) and we will then make arrangements for the interview at a time that suits you.

6. What will happen to me if I take part?

If you agree to take part, you will be asked to complete the questionnaire which you will access via the email link. This is anonymous and will take approximately 15 minutes of your time. The results of the questionnaire are completely confidential and there will be no way of tracing any of your replies back to yourself.

At the end of the questionnaire, you will be asked to consider taking part in an online interview. You will be able to choose at time which is convenient for you as well as an interview method. We will use the interview to ask further, more in-depth questions about the impact that occupational stress has on you and how you cope with it. The contact details provided on your questionnaire, enabling us to contact you to arrange an interview, will be stored safely and separately from your questionnaire answers, and your questionnaire will be made anonymous once this has been done.

Interviews may take place either through email or as videocalls and you will be able to choose your preferred method. A videocall interview will take 30 to 60 minutes of your time while if you choose to be interviewed by email then this will likely involve several email exchanges. The audio of online videocalls will be recorded so that we have an accurate record of the discussion and then they will be transcribed verbatim. However, once we have a written record of the interview it will be pseudonymised which means a code will be assigned to your transcript and the videocall recording deleted. All transcripts will then be cleaned so that all identifying information is removed before they are stored securely.

We will pseudonymise any quotes we use when we publish our research so that you cannot be identified in any way.

7. Expenses and payments

The only anticipated expense that will be incurred by you if you choose to take part, is your time. Unfortunately, we are unable to reimburse you for your time and there will be no payment for participating.

8. What data will be collected and / or measurements taken?

The only data collected are the answers from the questionnaire and the record of the interview, should you consent to also being interviewed. Again, all identifying information will be removed.

10. What are the possible disadvantages, burdens, and risks (if any) of taking part?

There are very few risks to taking part. The main burden is the time it will take you to complete the questionnaire (around 15 minutes). If you choose to also participate in the interview study, this will take between 30 and 60 minutes. However, if you are experiencing stress at work then you may find that talking about your experience of stress is difficult and if you feel distressed as a result, we advise you to contact a trusted medical professional in your own country who can provide any necessary care.

11. What are the possible advantages or benefits (if any) of taking part?

You will not receive any direct benefits of taking part in this research, however, the research may lead to a better awareness and understanding of work-related stress in your country and globally, which in turn may contribute to the development of interventions to manage workplace stress and improve the work environment for family physicians.

Confidentiality and Withdrawal

12. Will my data be kept confidential?

All questionnaire and interview data will be stored securely in a password protected file on Keele University's system.

Questionnaire data is fully anonymised. Any identifiers will be removed from the interview data before secure storage so that it is also anonymous, and all data is entirely confidential.

The data, when made anonymous, may be presented at academic conferences, or published as a project report, academic dissertation or in academic journals or book. It could also be made available to any commissioner or funder of the research.

Anonymous data, **which does not identify you**, will be publicly shared at the end of the project and made open access. A licence will be applied to this publicly shared data. This will allow anyone else (including researchers, businesses, governments, charities, and the general public) to use the anonymised data for any purpose that they wish, providing they seek permission and credit the University and research team as the original creators. No restrictions will be placed on this shared anonymised data limiting its reuse to only non-commercial ventures.

The raw data, which would identify you, will not be passed to anyone outside the research team without your express written permission. The exception to this will be any regulatory authority which has the legal right to access the data for the purposes of conducting an inspection, audit, or enquiry. These agencies treat your personal data in confidence.

The raw data will be retained for a minimum of 10 years. When it is no longer required, the data will be disposed of securely (e.g., electronic media and paper records / images) destroyed. Interview recordings will be destroyed as soon as data for analysis has been extracted and only the pseudonymised interview transcript data will be retained.

The School of Medicine at Keele University will be using information from you in order to undertake this research and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. Keele University will not keep any identifiable information about you

The legal basis for processing your personal data is that processing is necessary for the performance of a task carried out in the public interest – that is, scientific or historical research purposes. If you withdraw from this research, we may still rely on this lawful basis to continue using your data if your withdrawal would be of significant detriment to the research aims. Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. We will always have in place appropriate safeguards to protect your personal data. Your personal data will be held securely on university servers for 10 years and securely destroyed after that date.

You can find out more about how we use your information <https://www.keele.ac.uk/privacynotices/privacynotice-researchparticipants/> or by contacting the University's Data Protection Officer at dpo@keele.ac.uk.

If you wish to raise a complaint on how we have handled your personal data, you can contact our Data Protection Officer (dpo@keele.ac.uk) who will investigate the matter. If you are not satisfied with our response or believe we are processing your personal data in a way that is not lawful you can complain to the Information Commissioner's Office (ICO, <https://ico.org.uk/make-a-complaint/>).

13. What will happen if I don't want to carry on with the study?

As a volunteer you can stop any participation at any time or withdraw from the interview study up to 2 weeks after completing the interview without giving a reason. If you do withdraw from a study after some data have been collected, you will be asked if you are content for the data collected thus far to be retained and included in the study. If you prefer, the data collected can be destroyed and not included in the study. Once the research has been completed, and the data analysed, it will not be possible for you to withdraw your data from the study.

Further Information and Contacts

14. What if there is a problem?

If you have a query, concern, or complaint about any aspect of this study, in the first instance you should contact the researcher(s) if appropriate. If the researcher is a student, there will also be an academic member of staff listed as the supervisor whom you can contact. If there is a complaint and there is a supervisor listed, please contact the Supervisor with details of the complaint. The contact details for both the researcher and any supervisor are detailed on page 1.

If your concern or complaint is not resolved by the researcher or their supervisor, you should contact the approving Research Ethics Committee Chair:

REC Name: **xxxxxxx** Research Ethics Committee

Email address: xxxx.xxxx@keele.ac.uk

Telephone number: **#####** **#####**

(If the data collection is being undertaken outside of the UK, phone numbers should specify UK access codes and addresses should include the fact that Keele University is in the UK.)

15. Who is funding the research?

This research is being funded by Keele University. None of the researchers or study staff will receive any financial reward by conducting this study, other than their normal salary / bursary as an employee / student of the University.

16. Who has reviewed the study?

Research involving human participants is reviewed by an ethics committee to ensure that the dignity and well-being of participants is respected. This study has been reviewed by the **xxxxx Faculty Research Ethics Committee** and been given

favourable ethical opinion. It has also been reviewed by **ethics committees in each of the countries that we are collecting data from and been given a favourable ethical opinion.**

Thank you

Thank you for taking the time to read this information sheet and for considering volunteering for this research that is so critically needed at this time. If you agree to participate in the questionnaire, you can give your consent by completing the consent form at the beginning of the questionnaire. Your consent will be sought again for the interview study and a consent form will be emailed to you. You may download a copy of this information sheet for your records.

Information leaflet for the qualitative interview study

Title of Project: An investigation into the extent, the associated factors, and the experience of family physician burnout in low- and middle- income countries

Name and Contact Details of Researcher(s): Dr Tanya Wright;
t.r.wright@keele.ac.uk

Name and Contact Details of Supervisor: Professor Toby Helliwell;
t.helliwell@keele.ac.uk

REC Reference Numbers: Keele University FREC: MH-210193

Country specific REC reference number: (to be added once available)

1. Invitation

Thank you for taking part in the online questionnaire and indicating that you would be happy to be contacted about the more in-depth interview study. We would therefore, like to invite you to take part in our interview study. Joining the study is entirely up to you. Before you decide we would like to give you more details and information on our research project, why the research is being done and what it would involve for you. Please feel free to talk to others about the study if you wish. Do contact us if anything is unclear or you would like further details.

I am a family physician by training, and I am currently undertaking a PhD at Keele University, researching the impact of work-related stress and burnout in family physicians working in low- and middle-income countries across the world. We are working in collaboration with [insert name] in the department of family medicine at the University of [insert name]. Your help will give us an idea of the problem in your country and common themes identified internationally will help us develop support for family physicians both in your country specifically and also internationally.

2. Research Summary

This study is concerned with work related stress and burnout which is important because high levels of stress can have consequences for health and well-being as well as work performance. We are seeking participants who should be generalist physicians working in primary care or physicians who are specialists in family medicine. You may be on leave from work for any reason (for example, sick leave or maternity leave), as long as you have not been on leave for more than 12 months. Participation in this element of the research requires you to take part in an interview

(online, by email or telephone whichever you prefer). The interview will take between 30 and 60 minutes of your time.

Facts about participation

3. What is the purpose of the research?

Work stress and burnout is known to be associated with high workloads, understaffed work environments and reduced resources. Globally there are significant healthcare worker shortages, with the regions of Africa and South-East Asia being most affected. There are also significant imbalances in global health spending which negatively affects the availability of health resources in lower income countries. These shortages, in both available staff and resources, may result in high levels of workplace stress for physicians with consequences for their own health and well-being.

Given the essential role of family physicians in meeting the World Health Organisation's goal of universal healthcare coverage, it is vital to understand the impact of work-related stress in this group of physicians, especially with the added burden of the current covid-19 pandemic on workloads and resources. We hope that this research will improve our understanding of the impact of occupational stress on family physicians in low- and middle- income countries and inform the development of appropriate support and interventions for those most affected.

4. Why have I been invited?

You have been invited because you will have filled out our work stress questionnaire and given your consent at the end of it for us to contact you about participating in a further interview study. You have then been selected as one who has agreed and also fulfils our criteria for participation in the interview study. The more doctors that take part, the better understanding we will have, giving us the best evidence for how occupational stress impacts on family physician's lives both in your own country specifically, and for family physicians globally.

5. Do I have to take part?

Taking part in this research is entirely voluntary. It is up to you to decide if you want to volunteer for the research. If you agree to be interviewed, you may complete the online consent form via the link in the email and we will then contact you to make arrangements for the interview at a time that suits you. Your consent will be sought again at the start of the interview, and you will have the opportunity to ask any questions.

6. What will happen to me if I take part?

If you agree to take part and complete the online consent form, you will then be contacted with further information about arranging a time for interview that suits you.

We will use the interview to ask further, more in-depth questions about the impact that occupational stress has on you and how you cope with it.

Interviews may take place either through email, telephone, or as videocalls and you will be able to choose your preferred method. A telephone or videocall interview will

take 30 to 60 minutes of your time while if you choose to be interviewed by email then this will likely involve several email exchanges. The audio of telephone or online videocalls will be recorded so that we have an accurate record of the discussion and then they will be transcribed verbatim. However, once we have a written record of the interview it will be pseudonymised which means a code will be assigned to your transcript and the videocall recording deleted. All transcripts will then be cleaned so that all identifying information is removed before they are stored securely prior to analysis.

We will pseudonymise any quotes we use when we publish our research so that you cannot be identified in any way.

7. Expenses and payments

The only anticipated expense that will be incurred by you if you choose to take part, is your time. Unfortunately, we are unable to reimburse you for your time and there will be no payment for participating.

8. What data will be collected and / or measurements taken?

The only data collected are the record of the interview. Again, all identifying information will be removed.

10. What are the possible disadvantages, burdens, and risks (if any) of taking part?

There are very few risks to taking part. The main burden is the time it will take you to complete the interview study. This will take between 30 and 60 minutes. However, if you are experiencing stress at work then you may find that talking about your experience of stress is difficult and if you feel distressed as a result, we advise you to contact a trusted medical professional in your own country who can provide any necessary care.

11. What are the possible advantages or benefits (if any) of taking part?

You will not receive any direct benefits of taking part in this research, however, the research may lead to a better awareness and understanding of work-related stress in your country and globally, which in turn may contribute to the development of interventions to manage workplace stress and improve the work environment for family physicians.

Confidentiality and Withdrawal

12. Will my data be kept confidential?

All interview data will be stored securely in a password protected file on Keele University's system.

Any identifiers will be removed from the interview data before secure storage so that it is anonymous, and all data is entirely confidential.

The data, when made anonymous, may be presented at academic conferences, or published as a project report, academic dissertation or in academic journals or book. It could also be made available to any commissioner or funder of the research.

Anonymous data, **which does not identify you**, will be publicly shared at the end of the project and made open access. A licence will be applied to this publicly shared data. This will allow anyone else (including researchers, businesses, governments, charities, and the general public) to use the anonymised data for any purpose that they wish, providing they seek permission and credit the University and research team as the original creators. No restrictions will be placed on this shared anonymised data limiting its reuse to only non-commercial ventures.

The raw data, which would identify you, will not be passed to anyone outside the research team without your express written permission. The exception to this will be any regulatory authority which has the legal right to access the data for the purposes of conducting an inspection, audit, or enquiry. These agencies treat your personal data in confidence.

The raw data will be retained for a minimum of 10 years. When it is no longer required, the data will be disposed of securely (e.g., electronic media and paper records / images) destroyed. Interview recordings will be destroyed as soon as data for analysis has been extracted and only the pseudonymised interview transcript data will be retained.

The School of Medicine at Keele University will be using information from you in order to undertake this research and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. Keele University will not keep any identifiable information about you

The legal basis for processing your personal data is that processing is necessary for the performance of a task carried out in the public interest – that is, scientific or historical research purposes. If you withdraw from this research, we may still rely on this lawful basis to continue using your data if your withdrawal would be of significant detriment to the research aims. Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. We will always have in place appropriate safeguards to protect your personal data. Your personal data will be held securely on university servers for 10 years and securely destroyed after that date.

You can find out more about how we use your information

<https://www.keele.ac.uk/privacynotices/privacynotice-researchparticipants/> or by contacting the University's Data Protection Officer at dpo@keele.ac.uk.

If you wish to raise a complaint on how we have handled your personal data, you can contact our Data Protection Officer (dpo@keele.ac.uk) who will investigate the matter. If you are not satisfied with our response or believe we are processing your personal data in a way that is not lawful you can complain to the Information Commissioner's Office (ICO, <https://ico.org.uk/make-a-complaint/>).

13. What will happen if I don't want to carry on with the study?

As a volunteer you can stop any participation at any time or withdraw from the interview study up to 2 weeks after completing the interview without giving a reason. If you do withdraw from a study after some data have been collected, you will be

asked if you are content for the data collected thus far to be retained and included in the study. If you prefer, the data collected can be destroyed and not included in the study. Once the research has been completed, and the data analysed, it will not be possible for you to withdraw your data from the study.

Further Information and Contacts

14. What if there is a problem?

If you have a query, concern, or complaint about any aspect of this study, in the first instance you should contact the researcher(s) if appropriate. If the researcher is a student, there will also be an academic member of staff listed as the supervisor whom you can contact. If there is a complaint and there is a supervisor listed, please contact the Supervisor with details of the complaint. The contact details for both the researcher and any supervisor are detailed on page 1.

If your concern or complaint is not resolved by the researcher or their supervisor, you should contact the approving Research Ethics Committee Chair:

REC Name: **xxxxxxx Research Ethics Committee**

Email address: xxxx.xxxx@keele.ac.uk

Telephone number: **#####**

(If the data collection is being undertaken outside of the UK, phone numbers should specify UK access codes and addresses should include the fact that Keele University is in the UK.)

15. Who is funding the research?

This research is being funded by Keele University. None of the researchers or study staff will receive any financial reward by conducting this study, other than their normal salary / bursary as an employee / student of the University.

16. Who has reviewed the study?

Research involving human participants is reviewed by an ethics committee to ensure that the dignity and well-being of participants is respected. This study has been reviewed by the **xxxxx Faculty Research Ethics Committee** and been given favourable ethical opinion. It has also been reviewed by **ethics committees in each of the countries that we are collecting data from and been given a favourable ethical opinion.**

Thank you

Thank you for taking the time to read this information sheet and for considering volunteering for this research that is so critically needed at this time. If you agree to participate in the interview study, you can consent by clicking on the link to the online consent form. Once you have completed the consent form you will be contacted with further information about arranging a time for interview. You may download a copy of this information sheet for your records.

Consent form for qualitative interview study

Title of Project: An investigation into the extent, the associated factors, and the experience of family physician burnout in low- and middle- income countries

Name and Contact Details of Researcher(s): Dr Tanya Wright; t.r.wright@keele.ac.uk

Name and Contact Details of Supervisor: Professor Toby Helliwell; t.helliwell@keele.ac.uk

Keele University REC Reference Number: MH-210193

REC reference numbers for IRB approval in each country: (to be added)

Before you consent to participating in the research interview, please read the participant information sheet and then tick or mark each box with your initials if you agree. If you have any questions or queries before signing the consent form, please speak to the researcher.

Please initial the boxes

1. I have read and understood the research information sheet dated DD/MM/YYYY (version ##) (If you will answer No to this question, please do not proceed with this consent form until you are fully aware of what your participation in the project will mean.)
2. I have been given the opportunity to ask questions about the project and have had these answered satisfactorily.
3. I understand that my taking part is voluntary. I also understand that I can discontinue participation at any point, and I can also withdraw myself and my data from the interview study within 2 weeks of participation by contacting the researcher who interviewed me. I do not have to give any reasons for why I no longer want to take part and there will be no adverse consequences if I choose to withdraw.
4. I understand my personal details such as first name, and email address etc. will be collected but will not be revealed to people outside the project.
5. I understand that data collected during this research will be processed in accordance with data protection law in both my own country and the United Kingdom (UK) as explained in the Participant Information Sheet
6. I consent for my interview to be audio recorded. I understand that the pseudonymised transcripts will be stored securely for a minimum of 10 years after the end of the study declaration and that the pseudonymised transcripts may be re-used by researchers in the future.

☐
☐
☐
☐
☐
☐

7. I understand that quotes from the interview may be included in future reports or publications but that these will be pseudonymised and I will not be identified. ☐
8. I understand and agree that other authorised researchers will have access to this transcribed interview data only once it has been pseudonymised and if they agree to preserve the confidentiality of the information as requested in this form. ☐
9. I understand and agree that other authorised researchers may use my pseudonymised data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form. ☐
10. I understand that the pseudonymised results of this research may be published and meetings or academic conferences I give my permission for my pseudonymised data identify me, to be disseminated in this way. ☐
11. I understand that should I disclose any concerns with regard to my own, or others' professional practice in the course of the interview, the researcher might be duty bound to refer the matter to relevant agencies. ☐
12. I agree to take part in the above research ☐

Name of participant [printed]	Signature	Date

Name of person taking consent [printed]	Signature	Date

When completed, 1 copy for the participant, 1 copy for the research file

Appendix J: SPSS Codebook

Variable	SPSS Variable name	Coding instructions	Recoding
Identification number	ID		
Country	Country	0 = Pk 1 = SA 2 = M 3 = SL 4 = Za 5 = Ug	
Work position/job title	Position	1 = Dr not specified 2 = FP/FMS/GP/FM Reg 3 = MO, SHO, registrar, or clinical officer	
Years in current position	YearsPosition	1 = 0-5 2 = 6-10 3 = 11-15 4 = 16-20 5 = >20	Collapse categories 4 and 5 with 3 to make a 10+ years category (3) (recYearsPosition)
Years since UG medical school	Since MS	1 = 0-5 2 = 6-10 3 = 11-15 4 = 16-20 5 = 21-25 6 = 26-30 7 = 31-35 8 = >35	6 = >25, collapsed groups 7 and 8 together with 6 (sinceMSrec) STATA (Rec2MS): 1 = 0-10 2 = 11-20 3 = >20
Working or on leave	leave	1 = yes on leave 2 = no currently working	
How long on leave	LengthLeave	Length of leave in weeks	
Type of area working in	Area	1 = rural 2 = urban 3 = semi-urban 4 = Combined rural and urban	Collapse 3 and 4 – category 3=semi-urban and combined rural/urban (recArea)
Type of workplace	Workplace	1 = community clinic/private practice as an FP specialist 2 = hospital clinic/hospital 3 = both	
Type of employment	Employment	1 = private practice 2 = government employed 3 = NGO employed 4 = private non-profit	Collapsed into: 1=non-government employed (1,3, and 4) 2=government employed (2, and 5)

		5 = both gov't and private	(recEmployment)
How many patients each day	Patients	1 = <15 2 = 15-25 3 = 26-35 4 = 36-45 5 = >45	Collapsed into: 1=<15 2=15-35 3=>35 (recPatients)
Hours worked in a week	WeeklyHrs	1 = <20 2 = 20-30 3 = 31-40 4 = 41-50 5 = >50	Collapsed category 1 and 2: 1=<30; 2=31-40; 3=41-50; 4=>50 (recWeeklyHrs) Collapsed further into: 1=up to and including 40hrs pw 2= more than 40hrs pw (recBinaryWeeklyHrs) STATA (SecondRecWeeklyHrs): 1 = ≤ 40 hrs per week 2 = 41-50 hrs per week 3 = >50 hrs per week
Weekday night shifts pcm	Nights	1 = 0 2 = 1-4 3 = 5-8 4 = 9-12 5 = >12	Collapsed categories 3, 4 and 5 to make category 3 = 5+ nightshifts pcm (recNights)
Weekend shifts per 3/12	Weekends	1 = 0 2 = 1-3 3 = 4-6 4 = >6	Collapsed into: 1=0 2=1-6 3=>6 (RecWeekends)
Additional duties	AddDuties	1 = management 2 = teaching 3 = admin 4 = leadership 5 = research 6 = none	Recoded as BinaryAddDuties 0 = no additional duties 1=yes, additional duties
Number of additional duties	Additionalduties	Scale variable – simply how many out of the list of additional duties a participant was involved in	
How many hours on additional duties pw	AddHrs	Number of hours	
Second paid job	SecondJob	0 = no 1 = yes	
Second job hours pw	SJ hours	Number of hours	
Unpaid voluntary work	VW	0 = no 1 = yes	
Voluntary work hours pw	VW hours	Number of hours	

Time to travel to work	TravelTime	Time in minutes	
Mode of transport	Transport	1 = private car 2 = taxi 3 = bus 4 = motorbike 5 = bicycle 6 = on foot 7 = other	
Difficulty getting to work	TDiff	1 = always 2 = often 3 = sometimes 4 = rarely 5 = never	Collapsed into 1=sometimes, often, or always 2=rarely or never
Stressed at work	WStress	1 = yes 2 = no	
Single most stressful aspect of work	MostStressful	1 = workload 2 = non-clinical duties 3 = clinical duties 4 = level of support 5 = lack of adequate resources 6 = conflict at work 7 = work/family conflict 8 = inadequate salary 9 = understaffing 10 = other 11 = lack of educational opportunities	
Other stressful aspects	OtherStress		
Ways of coping with stress	Coping	1 = exercise 2 = hobbies 3 = voluntary work 4 = socialising 5 = other	
What change would make a difference	CDiff	1 = shorter work hours 2 = better pay 3 = fewer patients 4 = fewer non-clinical responsibilities 5 = more support 6 = clearly defined role/expectations 7 = better educational opportunities 8 = adequate resources 9 = better staffing levels 10 = other	

Biggest workplace problems in country			
Possible solutions to workplace stress			
Manager supportive	ManSupp	1 = strongly agree 2 = agree 3 = neither agree nor disagree 4 = disagree 5 = strongly disagree	Collapsed into: 1=agree or strongly agree 2=do not agree STATA: 0 = do not agree 1 = agree or strongly agree
Opportunities for CPD	CPD		
Often understaffed	Understaffing		
Colleagues not supportive	CollnotSupp		
Family support helps coping	FS		
Resources not always available	AR		
Outside interests help cope	IntCoping		
Often think of leaving	turnover		
Workload increase with Covid	WLCovid		
Manager support helps coping	ManCop		
Work home do not conflict	WHconflict		
Clearly defined role	Role		
Conflict at work	ConWork		
Colleague support for coping	CollCop		
Treated fairly at work	Fairness		
Competent	Comp		
Freedom to make decisions	Free		
Feel safe at work	Safe		
OLBI	Q1 to Q16	Enter number circled (reverse code starred items)	
Age group	agegp	1 = 20-29 2 = 30-39 3 = 40-49 4 = 50-59 5 = 60+	Collapsed groups 4 and 5 together to make group 4 a 50+ group (STATA) (agerec) Also collapsed into 1=under 40 and 2=40+ (recBinaryAge)
Sex	sex	0 = male 1 = female	
Marital status	marital	1 = single 2 = married	Collapsed to 2 groups: 0 = married or co-habiting

		3 = widowed 4 = divorced 5 = co-habiting 6 = prefer not to answer	1 = not in relationship (maritalrec)
Children	children	0 = no 1 = yes	
How many children	ChilNum	number	
Mean Age of children	ChilAge	Mean Age in years	
Other dependents	dependents	0 = no 1 = yes	
How many other dependents	DepNum	number	
Suffer from long term illness	Illness	0 = no 1 = yes	
Main carer	Carer	0 = no 1 = yes	
Anxiety	Anxiety	0 = no 1 = yes	
Depression	Depression	0 = no 1 = yes	
Alcohol	Alcohol	0 = no 1 = yes	
Increased alcohol past year	IncAlcohol	0 = no 1 = yes	
Smoking tobacco	smokeTob	0 = no 1 = yes	
Educational level	Educ	1 = Bachelors 2 = PGcert 3 = PGdip 4 = Masters 5 = PhD or doctor of medicine 6 = PG medical exams	Collapsed PGcert and PG medical exams (categories 2 and 6 to category 2) and Masters and PhD to a single category 4 (recEduc) Collapsed into 3 categories for STATA: 1 = Bachelors 2 = other postgrad qualifications 3 = Masters or PHD
Burnout	BO	0 = no/low risk 1 = yes/high risk	

If time/hours is given as a range the higher value is taken

If other is specified as clinic type:

District Hospital classified as hospital clinic

Private practice classified as community clinic

Eligibility criteria:

All whose job role is GP/FMS/Family physician/FMS resident are included

If job role is not as above then age and medical condition questions are looked at

Appendix K: Ethical approval documents



Keele University FMHS Faculty Research Ethics Committee

health.ethics@keele.ac.uk

13th September 2021

Dear Tanya

Project Title:	An investigation into the extent, the associated factors, and the experience of family physician burnout in low- and middle- income countries
REC Project Reference:	MH-210193
Type of Application	Main application

Keele University's Faculty of Medicine and Health Sciences Research Ethics Committee (FMHS FREC) reviewed the above project application.

Favourable Ethical opinion

The members of the Committee gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the programme,

1.	None

Reporting requirements

The University's standard operating procedures give detailed guidance on reporting requirements for studies with a favourable opinion including:

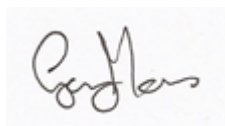
- Notifying substantial amendments
- Notifying issues which may have an impact upon ethical opinion of the study
- Progress reports
- Notifying the end of the study

Approved documents

The documents reviewed and approved are:

Document	Version	Date
All documents submitted with MH- 210193	1.0	07/06/2021
All revised documents submitted with MH- 210193	2.0	26/08/2021

Yours sincerely,



Dr Gary Moss

Chair

Keele University FMHS Faculty Research Ethics Committee

health.ethics@keele.ac.uk

21st March 2022

Dear Tanya

Project Title:	An investigation into the extent, the associated factors, and the experience of family physician burnout in low- and middle- income countries
REC Project Reference:	MH-210193 Amendment
Type of Application	Amendment

Keele University's Faculty of Medicine and Health Sciences Research Ethics Committee (FMHS FREC) reviewed the above project application.

Favourable Ethical opinion

The members of the Committee gave a favourable ethical opinion of the above amended application, on the basis described in the amended documentation.

Conditions of the favourable opinion

There are no conditions in relation to this amendment.

Reporting requirements

The University's standard operating procedures give detailed guidance on reporting requirements for studies with a favourable opinion including:

- Notifying substantial amendments

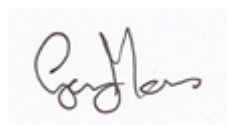
- Notifying issues which may have an impact upon ethical opinion of the study
- Progress reports
- Notifying the end of the study

Approved documents

The documents reviewed and approved are:

Document	Version	Date
All documents submitted with MH- 210193	1.0	07/06/2021
All revised documents submitted with MH- 210193	2.0	26/08/2021
Amended documents		

Yours sincerely,



Dr Gary Moss

Chair



KHYBER MEDICAL UNIVERSITY

KMU-ETHICS COMMITTEE

PHASE-V, HAYATABAD, KHYBER PAKHTUNKHWA, PESHAWAR, PAKISTAN

☎091-9217258,



KHYBER MEDICAL UNIVERSITY

☎091-9217704

No. DIR/KMU-EB/Al/000104

Dated: 19-01-2022

TO WHOM IT MAY CONCERN

Certified that after desk review ethical approval has been granted provisionally to the project title
"An investigation into the prevalence, the associated factors, and the experiences of family
physician burnout in low- and middle- income countries" submitted by **Dr. Abdul Jalil Khan**,
Assistant Professor, Department of Family Medicine, Institute of Public Health & Social Sciences
(IPH&SS), Khyber Medical University, Peshawar.

Dr. Zohaib Khan,
Secretary KMU-Ethics Committee



KHYBER MEDICAL UNIVERSITY

KMU-ETHICS BOARD

BLOCK -IV, PDA BUILDING, PHASE-V, HAYATABAD,
KHYBER PAKHTUNKHWA, PESHAWAR, PAKISTAN

☎ 091-9217258, 091-9217703

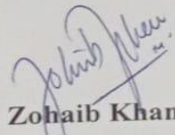
☎ 091-9217704

No.DIR/KMU-EB/AI/001004

Dated: 15-02-2022

TO WHOM IT MAY CONCERN

Certified that Ethical Approval has been granted to the project title "An Investigation into the prevalence, the associated factors and the experiences of family physicians burnout in low - and middle - income countries" submitted by **Dr. Abdul Jalil Khan**, Associate Professor, Department of Family Medicine, Institute of Public Health & Social Sciences (IPH&SS), Khyber Medical University, Peshawar.


Dr. Zohaib Khan,
Secretary,
KMU-Ethics Board

Approval Notice

New Application

18/05/2022

Project ID :24391

HREC Reference No: N22/02/019

Project Title: An investigation into family physician burnout in low- and middle-income countries.

Dear Prof R Mash

The **Response** received on 28/04/2022 was reviewed **approved** by members of **Health Research Ethics Committee** via **expedited** review procedures on 18/05/2022.

Please note the following information about your approved research protocol:

Approval date : 20 April 2022

Expiry date: 19 April 2023

Please remember to use your Project ID 24391 and Ethics Reference Number N22/02/019 on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review

Translation of the informed consent document(s) to the language(s) applicable to your study participants should now be submitted to the HREC.

Please note you can submit your progress report through the online ethics application process, available at: [Links Application Form Direct Link](#) and the application should be submitted to the HREC before the year has expired. Please see [Forms and Instructions](#) on our HREC website (www.sun.ac.za/healthresearchethics) for guidance on how to submit a progress report.

The HREC will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.

Please note that for studies involving the use of questionnaires, the final copy should be uploaded on Infonetica.

Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility, permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Please consult the Western Cape Government website for access to the online Health Research Approval Process, see: <https://www.westerncape.gov.za/generalpublication/healthresearch-approval-process>. Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.

For standard HREC forms and instructions, please visit: [Forms and Instructions](#) on our HREC website <https://applyethics.sun.ac.za/ProjectView/Index/24391>

If you have any questions or need further assistance, please contact the HREC office at 021 938 9677.

Yours sincerely,

Melody Shana

Coordinator: Health Research Ethics Committee 1

National Health Research Ethics Council (NHREC) Registration Number:

REG130408012 (HREC1) REG230208010 (HREC2)

The Health Research Ethics Committee (HREC) complies with the SA National Health Act No. 61 of 2003 as it pertains to health research. The HREC abides by the ethical norms and principles for research established by the [World Medical Association \(2013\) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects](#), the South African [Department of Health \(2006\) Guidelines for Good Practice in the Conduct of Clinical Trials with Human Participants in South Africa \(2nd edition\)](#), as well as the [Department of Health \(2015\) Ethics in Health Research Principles, Processes and Structures \(2nd edition\)](#).

The Health Research Ethics Committee reviews research involving human subjects conducted or supported by the Department of Health and Human Services, or other federal departments or agencies that apply the Federal Policy for the Protection of Human Subjects to such research (United States Code of Federal Regulations Title 45 Part 46); and/or clinical investigations regulated by the Food and Drug Administration (FDA) of the Department of Health and Human Services.

**Approval Letter
Progress Report**

11/05/2023

Project ID: 24391

Ethics Reference No: N22/02/019

Project Title: An investigation into family physician burnout in low- and middle-income countries.

Dear Prof R Mash

We refer to your request for an extension/annual renewal of ethics approval dated 04/04/2023.

The Health Research Ethics Committee reviewed and approved the annual progress report through an expedited review process.

The approval of this project is extended for a further year.

Approval date: 20 April 2023

Expiry date: 19 April 2024

Kindly be reminded to submit progress reports two (2) months before expiry date.

Where to submit any documentation

Kindly note that the HREC uses an electronic ethics review management system, *Infonetica* to manage ethics applications and ethics review process. To submit any documentation to HREC, please click on the following link: <https://applyethics.sun.ac.za>

Please remember to use your Project Id 24391 and ethics reference number N22/02/019 on any documents or correspondence with the HREC concerning your research protocol.

Please note that for studies involving the use of questionnaires, the final copy should be uploaded on Infonetica.

Yours sincerely,

Mrs A Fortuin
Health Research Ethics Committee 1 (HREC1)

National Health Research Ethics Council (NHREC) Registration Number:
REC-130408012 (HREC1) REC-230208010 (HREC2)

Federal Wide Assurance Number: 00001372
Office of Human Research Protections (OHRP) Institution Review Board (IRB) Number:
IRB0005240 (HREC1) IRB0005239 (HREC2)

The Health Research Ethics Committee (HREC) complies with the SA National Health Act No. 61 of 2003 as it pertains to health research. The HREC abides by the ethical norms and principles for research established by the World Medical Association (2013), Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects, the South African Department of Health (2006), Guideline for Good Practice in the Conduct of Clinical Trials with Human Participants in South Africa (2nd edition) as well as the Department of Health (2015). Ethics in Health Research: Principles, Processes and Structures (2nd edition).

The Health Research Ethics Committee reviews research involving human subjects conducted or supported by the Department of Health and Human Services, or other federal departments or agencies that apply the Federal Policy for the Protection of Human Subjects to such research (United States Code of Federal Regulations Title 45 Part 46); and/or clinical investigations regulated by the Food and Drug Administration (FDA) of the Department of Health and Human Services.



**UNIVERSITY
OF MALAYA**
MEDICAL CENTRE

MEDICAL RESEARCH ETHICS COMMITTEE
(Formerly known as Medical Ethics Committee)
UNIVERSITY OF MALAYA MEDICAL CENTRE
ADDRESS : LEMBAH PANTAI, 59100 KUALA LUMPUR, MALAYSIA
TELEPHONE : 03-79493209/2251 FAXIMILE : 03-79492030

NAME OF ETHICS COMMITTEE/IRB Medical Research Ethics Committee, University Malaya Medical Centre	MREC ID NO: 2022624-11341
ADDRESS : LEMBAH PANTAI, 59100 KUALA LUMPUR, MALAYSIA	
PROTOCOL NO(if applicable) :	
TITLE: An investigation into the prevalence, the associated factors, and the experiences of family physician burnout in Malaysia: A mixed-method study.	
PRINCIPAL INVESTIGATOR : DR Christine Shamala Selvaraj	SPONSOR Department Fund

The following item ☒ have been received and reviewed in connection with the above study to conducted by the above investigator.

☒ Application to Conduct Research Project(form)	Ver.No :	Ver.Date : 24-06-2022
☒ Study Protocol	Ver.No : 1.1	Ver.Date : 02-08-2022
☒ Patient Information Sheet	Ver.No : 1.0	Ver.Date : 23-06-2022
☒ Consent Form	Ver.No : 1.1	Ver.Date : 02-08-2022
☐ Questionnaire	Ver.No :	Ver.Date :
☒ Investigator's CV / GCP (DR Christine Shamala Selvaraj,Tanya Ruth Wright, Toby Helliwell, Ng Chirk Jenn,)	Ver.No :	Ver.Date :
☐ Insurance certificate	Ver.No :	Ver.Date :
☒ Other documents		
1) Questionnaire	Ver.No : 1.1	Ver.Date : 02-08-2022
2) Topic Guide	Ver.No : 1.0	Ver.Date : 26-07-2021

and the decision is ☒

- ☐ Approved (Full Board)
☒ Approved (Expedited)
☐ Rejected(reasons specified below or in accompanying letter)

Comments:

This is a mixed-methods research exploring burn-out among family physicians. There is no major ethical issue. Approved through expedited review.

The Investigators are required to:

- 1) follow instructions, guidelines and requirements of the Medical Research Ethics Committee.
- 2) report any protocol deviations/violations to Medical Research Ethics Committee.
- 3) provide annual and closure report to the Medical Research Ethics Committee.
- 4) comply with International Conference on Harmonization – Guidelines for Good Clinical Practice (ICH-GCP) and Declaration of Helsinki.
- 5) obtain a permission from the Director of UMMC to start research that involves recruitment of UMMC patient.
- 6) ensure that if the research is sponsored, the usage of consumable items and laboratory tests from UMMC services are not charged in the patient's hospital bills but are borne by research grant.
- 7) note that he/she can appeal to the Chairman of Medical Research Ethics Committee for studies that are rejected.
- 8) note that Medical Research Ethics Committee may audit the approved study.
- 9) ensure that the study does not take precedence over the safety of subjects.

Date of expedited approval : 11-08-2022

Approval By : PROF. DR. NIK SHERINA HAIDI BT HANAFI (Deputy Chairman, MREC)

This is a computer generated letter. No signature required.



Ethics Review Committee

A SIDCER (Strategic Initiative for Developing Capacity in Ethical Review) recognized ERC

Faculty of Medical Sciences, University of Sri Jayewardenepura
Gangodawila, Nugegoda, Sri Lanka



Chairperson

Prof. Manori Gamage

Secretary

Dr. Shyamini Adikaram

Committee Members

Prof. R. Wickremasinghe

Prof. S. Prathapan

Prof. S. Samaranayake

Prof. C. Nahallage

Dr. J. de Silva

Ms. J.M.B.N.Jayasundara

Dr. Chandana Hewage

Dr. Madura Jayawardane

Dr. Vajira Seneviratne

Dr. Hiranthinide Silva

Dr. Nilanka Perera

Dr. Nilangika

Sandakumari

Dr. Thushari Dissanayake

Dr. Lakmal Kulasekara

Ms. Chandrani Perera

Date: 27.02.2023

Our ref: ERC 47/22

ERC meeting date: 23rd February 2023

Dr. Aruni De Silva,
MBBS (Col), Dip. Veneriology, DFM,
MD (Family Medicine),
Senior Lecturer,
Department of Family Medicine,
Faculty of Medicine,
University of Sri Jayawardhanapura.

Dear Dr. Aruni De Silva,

Application Number: 47/22

Title: The prevalence, the associated factors, and the experiences of family physician burnout in low- and middle - income countries.

I am pleased to inform you that the FMS/USJP ERC at its meeting held on the above-mentioned date has granted ethical approval for your project as per details given below.

Document	Version No	Date of submission
Project proposal	03	15.02.2023
Participant consent forms - English	03	15.02.2023
Participant consent forms - Sinhala	X	X
Participant consent forms - Tamil	X	X
Participant information sheet - English	03	15.02.2023
Participant information sheet - Sinhala	X	X

Address all correspondence to: Secretary, Ethics Review Committee,
Faculty of Medical Sciences, University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka.
Tel. 94-11-2758588, Fax 94-11-2811480, erc.fms.usjp@gmail.com



Ethics Review Committee

ASIDCER (Strategic Initiative for Developing Capacity in Ethical Review) recognized ERC

Faculty of Medical Sciences, University of Sri Jayewardenepura
Gangodawila, Nugegoda, Sri Lanka



Chairperson

Prof. Manori Gamage

Secretary

Dr. Shyamini Adikaram

Committee Members

Prof. R. Wickremasinghe

Prof. S. Prathapan

Prof. S. Samaranayake

Prof. C. Nahallage

Dr. J. de Silva

Ms. J.M.B.N. Jayasundara

Dr. Chandana Hewage

Dr. Madura Jayawardane

Dr. Vajira Seneviratne

Dr. Hiranthinide Silva

Dr. Nilanka Perera

Dr. Nilangika

Sandakumari

Dr. Thushari Dissanayake

Dr. Lakmal Kulasekara

Ms. Chandrani Perera

Participant information sheet – Tamil	X	X
Study instrument - English	03	15.02.2023
Study instrument - Sinhala	X	X
Study instrument - Tamil	X	X

The ethical approval for your project is effective from the above-mentioned ERC meeting date.

We affirm that none of the proposed study team members were present during the decision-making process of the ERC. The quorum requirements were met.

The approval is valid until one year from the date of sanction. You may make a written request for renewal / extension of the validity, along with the submission of annual status report. Please note that ethical approval would be revoked if any alteration is made to the project without obtaining prior written consent from the ethics review committee.

As the Principal Investigator, you are expected to ensure that procedures performed under the project will be conducted in accordance with all relevant national and international policies and regulations that govern research involving human participants.

Please note that this approval is subjected to the following condition:

- Progress reports to be submitted annually.
- All serious adverse events (SAEs) that may occur in Sri Lanka should be reported within 07 calendar days of their occurrence to the ERC, FMS USJ
- Any serious adverse event, which has arisen during the clinical trial or which has come to your knowledge from reports other participating trial sites should be informed in writing to ERC FMS, USJ within 30 working days.
- The adverse events should be reported in the format of the attached adverse events reporting form.
- The final report to be submitted at the completion of the study.

Address all correspondence to: Secretary, Ethics Review Committee,
Faculty of Medical Sciences, University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka.
Tel. 94-11-2758588, Fax 94-11-2811480, erc.fms.usjp@gmail.com



Ethics Review Committee

A SIDCER (Strategic Initiative for Developing Capacity in Ethical Review) recognized ERC

Faculty of Medical Sciences, University of Sri Jayewardenepura
Gangodawila, Nugegoda, Sri Lanka



Chairperson

Prof. Manori Gamage

Secretary

Dr. Shyamini Adikaram

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Dr. Hiranthinide Silva

Dr. Nilanka Perera

Dr. Nilangika

Sandakumari

Dr. Thushari Dissanayake

Dr. Lakmal Kulasekara

Ms. Chandrani Perera

- In the event of any complaints from the participants, these should be reported to the Secretary, ERC FMS USJ.

- In the events of any protocol amendments, ERC must be informed and the amendments should be highlighted in clear terms as follows:

a. The exact alteration/amendment should be specified and indicated where the amendment occurred in the original project. (Page no. etc.)

b. If the amendments require a change in the consent form, the copy of revised Consent Form should be submitted to Ethics Committee for approval.

Thank you.

Yours Sincerely,

Prof. Manori Gamage,
Chairperson

Dr. Shyamini Adikaram
Secretary

Address all correspondence to: Secretary, Ethics Review Committee,
Faculty of Medical Sciences, University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka.
Tel. 94-11-2758588, Fax 94-11-2811480, erc.fms.usjp@gmail.com



UNIVERSITY OF ZAMBIA
BIOMEDICAL RESEARCH ETHICS COMMITTEE

Telephone: +260 977925304

Telegrams: UNZA, LUSAKA

Telex: UNZALU ZA 44370

Fax: + 260-1-250753

Ridgeway Campus

P.O. Box 50110

Lusaka, Zambia

E-mail: unzarec@unza.zm

Federal Assurance No. FWA0000033

IRB00001131 of IORG0000774

NHRAR-REC No 2021-05-0002

16th February, 2023

Your REF. No. 3598-2022

Dr. Tanya Wright,
University of Zambia,
School of Medicine,
P. O Box 50110,
Lusaka.

Dear Dr. Wright,

**RE: AN INVESTIGATION INTO THE PREVALENCE, THE ASSOCIATED FACTORS,
AND THE EXPERIENCES OF FAMILY PHYSICIAN BURNOUT IN LOW- AND
MIDDLE-INCOME COUNTRIES (REF. NO. 3598-2022)**

The above-mentioned research proposal was presented to the Biomedical Research Ethics Committee on 15th February, 2023. The proposal is **approved**. The approval is based on the following documents that were submitted for review:

- a) **Study proposal**
- b) **Questionnaires**
- c) **Participant Consent Form**

APPROVAL NUMBER

: REF. 3598-2022

This number should be used on all correspondence, consent forms and documents as appropriate.

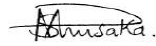
- **APPROVAL DATE** : 16th February 2023
- **TYPE OF APPROVAL** : Standard
- **EXPIRATION DATE OF APPROVAL** : 15th February 2024

After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the UNZABREC Offices should be submitted one month before the expiration date for continuing review.

- **SERIOUS ADVERSE EVENT REPORTING** : All SAEs and any other serious challenges/problems having to do with participant welfare, participant safety and study integrity must be reported to UNZABREC within 3 working days using standard forms obtainable from UNZABREC.
- **MODIFICATIONS**: Prior UNZABREC approval using standard forms obtainable from the UNZABREC Offices is required before implementing any changes in the Protocol (including changes in the consent documents).

- **TERMINATION OF STUDY:** On termination of a study, a report has to be submitted to the UNZABREC using standard forms obtainable from the UNZABREC Offices.
- **NHRA:** You are advised to obtain final study clearance and approval to conduct research in Zambia from the National Health Research Authority (NHRA) before commencing the research project.
- **QUESTIONS:** Please contact the UNZABREC on Telephone No. +260977925304 or by e-mail on unzarec@unza.zm.
- **OTHER:** Please be reminded to send in copies of your research findings/results for our records. You are also required to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study. Use the online portal: unza.rhinno.net for further submissions.

Yours sincerely,



Sody Mweetwa Munsaka, BSc., MSc., PhD

CHAIRPERSON

Tel: +260977925304

E-mail: s.munsaka@unza.zm



NATIONAL HEALTH RESEARCH AUTHORITY

Lot No. 18961/M, off Kasama Road, Chalala, P.O. Box 30075, LUSAKA

Tell: +260211 250309 | Email: znhrasec@nhra.org.zm | www.nhra.org.zm

Ref No: NHRA00005/21/03/2023

Date: 21st March 2023

The Principal Investigator,
Dr. Tanya Wright,
University of Zambia, School of Medicine,
Lusaka, Zambia.

Dear Dr Wright,

Re: Request for Authority to Conduct Research

The National Health Research Authority is in receipt of your request for ethical clearance and authority to conduct research titled **“An Investigation into The Prevalence, The Associated Factors, And the Experiences of Family Physician Burnout in Low- And Middle-Income Countries.”**

I wish to inform you that following submission of your request to the Authority, our review of the same and in view of the ethical clearance, this study has been **approved** on condition that:

1. The relevant Provincial and District Medical Officers where the study is being conducted are fully appraised;
2. Progress updates are provided to NHRA bi-annually from the date of commencement of the study;
3. The final study report is cleared by the NHRA before any publication or dissemination within or outside the country;
4. After clearance for publication or dissemination by the NHRA, the final study report is shared with all relevant Provincial and District Directors of Health where the study was being conducted, University leadership, and all key respondents.

Yours sincerely,

National Health Research Authority

Prof Godfrey Biemba,
Director/Chief Executive Office

Appendix L: Detailed chi-squared analyses

Country specific results

Chi-squared tests of independence (with Yates Continuity Correction) were performed on the same set of variables in each individual country dataset to assess the relationship between burnout and these variables. Where the assumptions for the chi-squared test of independence were not met and the variable was binary, Fisher's exact test was used. Due to small sample sizes, several non-binary variables did not meet the assumptions for the chi-squared test of independence. The null hypothesis was that none of the variables had a relationship with burnout.

Pakistan

The total sample size for Pakistan was 108. The following variables met the assumptions for the chi-squared test of independence and were found to have a statistically significant relationship with burnout: a history of or treatment for anxiety, $X^2 (1, N=101) = 5.266, p = .02, \phi = 0.253$; difficulties travelling to work, $X^2 (1, N=106) = 6.745, p = .009, \phi = -0.274$; autonomy at work, $X^2 (1, N=98) = 12.052, p = .001, \phi = 0.374$; agreement with the statement colleague support helps coping with stress, $X^2 (1, N=94) = 4.870, p = .03, \phi = 0.253$; opportunities for CPD, $X^2 (1, N=98) = 4.845, p = .03, \phi = 0.246$; fair treatment at work, $X^2 (1, N=97) = 9.774, p = .002, \phi = 0.341$; a supportive manager, $X^2 (1, N=73) = 6.376, p = .01, \phi = 0.328$; agreement with the statement manager support helps deal with work pressure, $X^2 (1, N=83) = 4.496, p = .03, \phi = 0.263$; a clearly defined role at work, $X^2 (1, N=100) = 6.841, p = .009, \phi = 0.285$; turnover intention, $X^2 (1, N=99) = 8.772, p = .003, \phi = -0.322$; and work/home responsibilities do not conflict, $X^2 (1, N=100) = 12.524, p < .001, \phi = 0.377$.

South Africa

The total sample size for South Africa was 82. Variables with a statistically significant relationship with burnout in the South Africa dataset were as follows: fair treatment at work, $\chi^2 (1, N=79) = 4.401, p = .04, \phi = 0.270$; conflict at work, $\chi^2 (1, N=82) = 8.016, p = .005, \phi = -0.345$; turnover intention, $\chi^2 (1, N=82) = 14.072, p < .001, \phi = -0.446$; and agreement with the statement that manager support helps deal with work pressure (Fisher's exact test, two-tailed, $p = .007$)

Malaysia

The total sample size for Malaysia was 163. Variables with a statistically significant relationship with burnout were as follows: type of employment (Fisher's exact test, two-tailed, $p = .04$); a supportive manager, $\chi^2 (1, N=154) = 10.845, p = .001, \phi = 0.280$; agreement with the statement that manager support helps deal with work pressure, $\chi^2 (1, N=151) = 12.163, p < .001, \phi = 0.300$; necessary resources not always available, $\chi^2 (1, N=161) = 9.121, p = .003, \phi = -0.254$; conflict at work, $\chi^2 (1, N=163) = 9.060, p = .003, \phi = -0.250$; a clearly defined role at work, $\chi^2 (1, N=162) = 6.002, p = .01, \phi = 0.207$; feeling safe at work, $\chi^2 (1, N=162) = 8.970, p = .003, \phi = 0.253$; work/home responsibilities do not conflict, $\chi^2 (1, N=163) = 8.438, p = .004, \phi = 0.242$; and turnover intention, $\chi^2 (1, N=159) = 25.762, p < .001, \phi = -0.417$.

Sri Lanka and Zambia

Sample sizes were small for Sri Lanka and Zambia, 53 and 45 respectively, which will impact on the validity, reproducibility, and reliability of the results, increasing the risk of both type I and type II errors (Blackford, 2017). In the Sri Lanka dataset one demographic variable: living with other dependents, $\chi^2 (1, N=48) = 0.00, p = 1.0, \phi = 0.00$; and two work characteristics variables: increased workload in the Covid pandemic, $\chi^2 (1, N=52) = 0.00, p = 1.0, \phi = 0.00$; and work/home conflict, $\chi^2 (1, N=53) = 0.514, p = .47, \phi = 0.142$, met the assumptions for

the chi-squared test of independence. However, none had a statistically significant relationship with burnout. Using Fisher's exact test, one variable in the Sri Lanka dataset, relationship status (married/co-habiting vs not married/co-habiting) was found to have a statistically significant relationship with burnout (two-tailed, $p = .05$).

None of the variables in the Zambia dataset met the assumptions for the chi-squared test of independence therefore Fisher's exact test was used to determine whether any of the binary variables had a statistically significant relationship with burnout. Results showed that opportunities for CPD (two-tailed, $p = .01$), autonomy at work (two-tailed, $p = .03$), and turnover intention (two-tailed, $p = .009$) all had a statistically significant relationship with burnout.

Gender differences

Using the combined dataset, gender differences in the factors associated with burnout were identified. Variables that were identified as having a statistically significant relationship with burnout for men but not for women were: past history or treatment for anxiety $X^2 (1, N=165) = 5.525, p = .02, \phi = 0.200$; family support helpful for coping $X^2 (1, N=162) = 5.092, p = .02, \phi = 0.196$; difficulties travelling to work $X^2 (1, N=170) = 7.474, p = .006, \phi = -0.223$; and years since medical school $X^2 (2, N=168) = 10.154, p = .006, \text{Cramer's } V = 0.246$. Those that had a statistically significant relationship with burnout for women but not men were as follows: opportunities for CPD $X^2 (1, N=222) = 13.443, p < .001, \phi = 0.258$; work resources not always available $X^2 (1, N=222) = 8.502, p = .004, \phi = -0.208$; manager support helps deal with work pressure $X^2 (1, N=201) = 19.175, p < .001, \phi = 0.322$; colleague support helps coping $X^2 (1, N=218) = 7.950, p = .005, \phi = 0.203$; clearly defined work role $X^2 (1, N=224) = 7.185, p = .007, \phi = 0.190$; feeling safe at work $X^2 (1, N=223) = 14.320, p < .001, \phi = 0.265$;

and exercise as a coping strategy χ^2 (1, N=192) = 5.545, p = .02, ϕ = -0.185. See Appendix L

Table 1 below.

Appendix L Table 1: Gender differences in associated factors

	VARIABLE	CHI SQUARED ¹⁶	df	P VALUE ($\leq .05$)	PHI OR CRAMER'S V
MALE	Anxiety	5.525	1	.02	0.200
	Family support helps coping	5.092	1	.02	0.196
	Difficulty travelling to work	7.474	1	.006	-0.223
	Years since medical school (0-10; 11-20; >20)	10.154	2	.006	0.246
FEMALE	Opportunities for CPD	13.443	1	<.001	0.258
	Work resources are not available	8.502	1	.004	-0.208
	Clearly defined work role	7.185	1	.007	0.190
	Colleague support helps coping	7.950	1	.005	0.203
	Manager support helps coping	19.175	1	<.001	0.322
	Feel safe at work	14.320	1	<.001	0.265
	Exercise as a coping strategy	5.545	1	.02	-0.185

Gender differences within the country data were also identified for three of the five countries: Pakistan, South Africa, and Malaysia (see Appendix L Table 2). No significant

¹⁶ Chi-squared with Yates continuity correction for those variables with df=1

gender differences were identified within the Sri Lankan and Zambian datasets. When the dataset from Pakistan was grouped by gender the following variables had a statistically significant association with burnout for men only: past history or treatment for anxiety $X^2 (1, N=61) = 4.138, p = .04, \phi = 0.299$; having a supportive manager $X^2 (1, N=42) = 6.431, p = .01, \phi = 0.447$; work/home responsibilities do not conflict $X^2 (1, N=59) = 7.228, p = .007, \phi = 0.387$; turnover intention $X^2 (1, N=58) = 4.670, p = .03, \phi = -0.323$; and difficulties travelling to work $X^2 (1, N=66) = 7.398, p = .007, \phi = -0.369$. The sample of women within the Pakistan sample was smaller than the sample of men and therefore several variables did not meet the assumptions for the chi-squared test, in these cases Fisher's exact test was used. The following variables had a statistically significant association with burnout for women only: opportunities for CPD (two-tailed, $p = .03$); and colleague support helps to cope with stress (two-tailed, $p = .03$).

There were also several differences between gender within the South Africa dataset. This was a smaller sample overall, and thus Fisher's exact test was used. The following three variables had a statistically significant association with burnout for women only: conflict at work (two-tailed, $p = .01$); manager support helps deal with work pressure (two-tailed, $p = .02$); and turnover intention (two-tailed, $p = .004$). There were no variables in this sample that were significant only for men.

Grouping the Malaysia dataset by gender also revealed several gender differences. The following variables had a statistically significant association with burnout for women but not for men: supportive manager $X^2 (1, N=104) = 9.791, p = .002, \phi = 0.331$; availability of resources $X^2 (1, N=109) = 6.658, p = .01, \phi = -0.272$; manager support helps deal with work pressure $X^2 (1, N=103) = 12.597, p < .001, \phi = 0.376$; colleague support helps cope with stress $X^2 (1, N=108) = 5.253, p = .02, \phi = 0.247$; and safety at work $X^2 (1, N=109) = 7.109, p =$

.008, $\phi = 0.282$. There was one variable in this dataset that was significant for men only and that was the variable work/home responsibilities do not conflict (Fisher's exact test, two-tailed, $p = .02$).

Appendix L Table 2: Gender differences in associated factors by country

Country	Gender	Variable	Chi-squared	df	P value ($\leq .05$)	Phi or Cramer's V	Fisher's exact test (two-tailed)
Pakistan	Male	History or treatment for anxiety	4.138	1	.04	0.299	
		Supportive manager	6.431	1	.01	0.447	
		Work/home responsibilities do not conflict	7.228	1	.007	0.387	
		Turnover intention	4.670	1	.03	-0.323	
		Difficulties travelling to work	7.398	1	.007	-0.369	
	Female	Opportunities for CPD					.03
		Colleague support helps to cope with stress					.03
South Africa	Female	Conflict at work					.01
		Manager support helps deal with work pressure					.02
		Turnover intention					.004
Malaysia	Male	Work/home responsibilities do not conflict					.02
	Female	Supportive manager	9.791	1	.002	0.331	
		Resources I need are available	6.658	1	.01	-0.272	
		Manager support helps deal with work pressure	12.597	1	<.001	0.376	
		Colleague support helps cope with stress	5.253	1	.02	0.247	
		I feel safe at work	7.109	1	.008	0.282	

Appendix M: Poisson regression sensitivity analysis – original data (not imputed)

Burnout	Model 1			Model 2			Model 3		
	IRR	CI	<i>P</i> (≤ .05)	IRR	CI	<i>P</i> (≤ .05)	IRR	CI	<i>P</i> (≤ .05)
sex									
female	1.04	0.93 – 1.16	.533	1.06	0.96 – 1.18	.27	0.97	0.84 – 1.12	.66
Age group									
30-39	0.91	0.85 – 0.98	.02	0.91	0.83 – 0.99	.03	0.94	0.81 – 1.09	.43
40-49	0.99	0.94 – 1.05	.71	1.00	0.93 – 1.07	.94	0.99	0.83 – 1.17	.90
50+	0.73	0.59 – 0.89	.002	0.74	0.56 – 0.98	.03	0.81	0.59 – 1.12	.20
Years since medical school									
10-20	0.97	0.93 – 1.00	.09	0.97	0.94 – 1.00	.09	1.00	0.93 – 1.07	.95
>20	0.90	0.76 – 1.05	.17	0.92	0.81 – 1.05	.23	0.97	0.74 – 1.27	.82
Education									
Postgrad exams or cert/dip	1.00	0.88 – 1.13	.98	0.98	0.86 – 1.13	.83	0.93	0.78 – 1.10	.38
Masters or PhD	0.96	0.93 – 0.99	.02	0.98	0.92 – 1.05	.58	0.99	0.88 – 1.12	.92
Daily patient numbers									
15-35				0.99	0.78 – 1.26	.96	0.97	0.83 – 1.14	.74
>35				1.08	0.88 – 1.33	.46	0.97	0.79 – 1.19	.77
Weekly hours									
41-50				1.06	0.98 – 1.15	.14	1.03	0.89 – 1.19	.71
>50				1.11	1.04 – 1.18	.001	1.09	0.98 – 1.20	.10
We are often understaffed									
Agree				1.18	1.04 – 1.35	.01	1.05	0.83 – 1.34	.67
Resources not available									
Agree							0.92	0.80 – 1.05	.22
Work offers opportunities for CPD									
Agree							1.07	0.94 – 1.22	.31
Clearly defined role									
Agree							0.97	0.89 – 1.04	.39
Treated fairly									
Agree							1.02	0.90 – 1.16	.74

Safe at work Agree							1.03	0.88 – 1.21	.70
Autonomy at work Agree							1.13	1.00 – 1.27	.05
Colleagues not supportive Agree							1.04	0.90 – 1.21	.59
Manager is supportive Agree							1.17	1.09 – 1.26	<.001
Often conflict at work Agree							0.88	0.78 – 1.00	.05
Work and home responsibilities do not conflict Agree							1.19	1.04 – 1.35	.009