Title: Managing work participation for people with rheumatic and musculoskeletal diseases

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**Abstract**

Improving work participation for individuals with rheumatic and musculoskeletal diseases (RMDs), has gained increasing interest over the last 10 years. New approaches are based upon increasing adoption of a biopsychosocial approach to improving work participation, incorporating evidence that health professionals within multidisciplinary teams have a key and critical role. In particular, interaction between health professionals and employers, and rehabilitation services that are linked to the workplace are key elements for improving work participation for people with RMDs. This review outlines recent research that underpins approaches for health professionals to develop their role in improving work participation for people with RMDs based on recent research; it outlines how to measure work-related outcomes in clinical practice, models of work participation and approaches for health professionals to improve work participation outcomes. The potential for developing the role of health professionals in future years is also outlined.

Key words (5-10): work, employment, work disability, absenteeism, presenteeism, biopsychosocial, multidisciplinary team, occupational rehabilitation, vocational, health professionals

**Introduction**

The relationship between rheumatic and musculoskeletal diseases (RMDs) and work participation is demanding increasing attention from health professionals, people with RMDs, policymakers and employers. The ability to effectively manage RMDs, and to reduce their impact by maintaining employment and continuing a productive life for people is important for health professionals. Since 2000, there have been clear policy directions to increase participation in work by people with RMDs, particularly for older adults, and health professionals are urged to routinely consider work in their assessment and management [e.g.1,2]. This review includes recent research that underpins approaches for health professionals to develop their role in improving work participation for people with RMDs based on recent research; it outlines how to measure work outcomes in clinical practice, models of work participation and approaches for health professionals to improve work participation outcomes through health promotion or linking rehabilitation goals to productive work life. The potential for developing the role of health professionals in future years is also outlined.

**The need to improve work participation for people with RMDs**

The drive to improve work participation for all adults, not only those with RMDs, has increased over the last ten years due to greater acknowledgement of the potential health and economic benefits for people to stay employed [e.g.3] and the need to extend working lives and enable people to work longer as the population ages and retirement is delayed.

*Benefits for people with RMDs*

Although published in 2006, the review “Is work good for your health and wellbeing?” remains a key source for highlighting the benefits of work [4]. This review focused on a broad definition of work, which included volunteering, education and caring for family in addition to paid work. Its findings are commonly cited by policymakers and other stakeholders to emphasize that not only is employment good for health, but it can also promote recovery among people with health conditions. The review highlights that health, wellbeing and happiness are linked to work participation, and that “good work” is key; that is work that is rewarding, allows a sense of achievement and does not have a direct negative impact on health [4]. Work participation is important for an individual’s identity, social roles and social status; employment is a key determinant of physical and mental health and mortality [4]. Strategies to improve work participation will enhance the quality of life, independence and sense of control and worth of people with RMDs as well as reduce the health and societal economic impact. Improving work participation also has economic benefits for society, with increased tax intake for governments, innovation and economic growth.

To increase work participation, national and international policies have encouraged strategies to maintain and improve the health and work capacity of workers (to prevent work loss), as well as healthier workplaces (for example, though the provision of accommodations to facilitate people with lower capacity to stay in the workplace and maintain their productivity) [5]. This reflects a broader biopsychosocial approach to improving work participation encouraging interdisciplinary, joined up thinking among multiple agencies linked to maintaining work participation for people with RMDs, including a key role for employers. For health professionals this highlights the need for acknowledgement of different models of work participation (bedsides a purely biologic perspective) and methods to improve work participation (described later in this review).

*Extending working life*

In addition to this invigorated approach to work, there is an even greater need to focus on older workers. Countries all over the world are experiencing population ageing and life expectancy extensions. In most countries the percentage of the population aged 65 and over is increasing. The resulting strain on pension and healthcare provision has led governments to make policy changes to raise retirement ages to improve the ratios of dependents to working age adults (i.e. increase the number of adults in work compared to those who are not). Across Europe there are targets to increase the proportion of older people in the workforce; state retirement age in France, Sweden, Germany and Spain will increase to 67 between 2023 and 2027 and in the United Kingdom to 68 by 2046 [6,7]. Plans to extend working life means that there will be a greater number of older adults with RMDs who are expected to remain in work; the incidence of new cases presenting to healthcare and the prevalence of disabling RMDs increases with age within the critical age range of 50-70 years [8,9]. This will lead to an additional demand on health care and health professionals to improve individuals’ capacity to stay in work [10].

***The impact of RMDs on work***

The impact of RMDs on work is significant; RMDs and mental health conditions are the two main reasons for loss of work participation and health related withdrawal from employment [11]. People with RMDs are less likely to be in employment than those without; for example in the United Kingdom, the employment rate for people with RMDs was almost 20% lower than the employment rate of people with no significant condition or disability (62.4% compared to 80.4%) [12]. The burden on work, due to absenteeism (missing part or whole days from work measured through number of days or hours off work) or presenteeism (an individual remains in work but with difficulty or reduced efficiency or productivity) has been reported from numerous studies. Although measure of presenteeism can vary more than measures of absenteeism due to differences in self-reported data, it is generally accepted that the impact on work is greater due to presenteeism than absenteeism [13,14]. Notably individuals who report presenteeism are not only those who are experiencing increasing difficulty due to reduced work capacity and inadequate workplace adaptation but are also those who have returned to work, following an acute episode or flare-up of pain and disability, and are increasing their work capacity and participation (i.e. in this case presenteeism is not a bad thing). This further compounds the challenge of measuring and interpreting levels of presenteeism and perhaps identifying if it exists (as a binary outcome; there is presenteeism or not) rather than the extent may be the best way forwards.

People with inflammatory arthropathies (such as rheumatoid arthritis) are more at risk of work problems than those with non-inflammatory arthropathies (such as osteoarthritis), with a higher proportion of those with these conditions experiencing being out of employment, absenteeism and presenteeism. Around a third of people with an inflammatory arthropathy will stop working (that is leave employment) within three years of diagnosis; this increases to 50% within 10 years [15]. Although the level of presenteeism prior to leaving work has not been well quantified, it is expected that reasons for leaving the workplace will also drive high levels of presenteeism. Estimates of absenteeism for people with rheumatoid arthritis in the United Kingdom are 40 days sick leave per year compared to the national average of 6.5 days [15].

From a societal perspective, the majority of total impact of RMDs on work is driven primarily by non-inflammatory arthropathies, due to their much higher prevalence compared to inflammatory arthropathies. Taking osteoarthritis as an example, in adults aged fifty and over, one in four adults with osteoarthritis will leave the workplace prematurely [16]. Of those who remain in the workplace 30% report reduced productivity and a further 20% develop reduced work productivity when followed for three years [17]. The main reason for the link between osteoarthritis and work is reduced physical capacity but workplace factors such as workplace support and job opportunities are also important, again highlighting the need for a biopsychosocial and population level approach to improving work participation [16,17]. The impact of non-inflammatory arthropathies on work will continue to grow due to population ageing, later retirement, and an increase in the risk factors for osteoarthritis incidence (e.g. obesity) [18].

**Improving work participation for people with RMDs**

*Measure work as an outcome in working age adults*

Measuring work outcomes (absenteeism, presenteeism, return-to-work and work capacity (in terms of work limitations)) should be included routinely in the management of RMDs in working-age adults. Despite a lack of consensus in how best to measure these constructs there are a number of well-accepted indicators and instruments that can be used in clinical practice and research; Table 1 contains examples of instruments that can be used in clinical practice by health professionals. These instruments have been highlighted in recent reviews, are applicable across a range of health problems (although some can be used to applied to measure work issues to RMDs) and are readily available for use [19-23]. Selection of an instrument is dependent on the constructs that health professionals would like to measure (e.g. absenteeism, presenteeism, limitation), responder burden (length of time to complete the questionnaire), administrative burden (time taken to calculate scores), validity and reliability. The validity and reliability of these tools are comparable to well-accepted health outcome measures; that is the instruments measure the intended concepts (validity), perform consistently (internal consistency and test-retest reliability), and are considered to be acceptable for routine application [20,21,24-27].

The Work Productivity and Activity Impairment Questionnaire (WPAI) [28], Stanford Presenteeism Scale (SPS) [29], Work Ability Index (WAI) [30], Health and Labor Questionnaire (HLQ) [31] and Quantity and Quality Method (QQ) [32] are Instruments that can be selected to measure either absenteeism or presenteeism or both. The WPAI is a freely available and easily accessible tool that can be used to identify the presence and extent of absenteeism (percentage of time off work) and presenteeism (percentage of productivity loss) due to general health or can be applied specifically to RMDs [28]. The WPAI has low responder burden, taking between 2 and 5 minutes to complete. Studies support the validity of the WPAI for measuring absenteeism and presenteeism [20]. The SPS (measures presenteeism only) and WAI (measures absenteeism and presenteeism) have similar responder burden as the WPAI but have lower administrative burdens with only summations of responses required for scores. The SPS (6 item version) contains six Likert scale questions which can focus on presenteeism linked to a RMD (for example, ‘Because of my rheumatoid arthritis, the stresses of my job were much harder to handle’. Similarly, WAI is comprised mainly of Likert scale items and scoring is by summing the points associated with each response.

The HLQ measures both absenteeism and presenteeism, and offers the opportunity to calculate the economic costs of work loss [31]. It contains 17 items and requires approximately 10 minutes to complete. The HLQ has a greater administrative burden with scoring methods that vary across questions and the four modules (absence from paid work, reduced productivity at paid work, unpaid work, impediments to paid and unpaid labour). Interpretation of unpaid work scores requires comparison with scores for the general population. However, individual measures of absenteeism and presenteeism are straightforward to calculate using responses in two of the four modules (absence from paid work and reduced productivity at paid work). The QQ involves one question relating to work quantity and one question relating to work quality which together can be used to derive an overall estimate of hours of work lost in a day due to absenteeism and presenteeism [32]. Both responses are given as a number from 1 to 10 (on a visual analogue scale) and calculation of the final QQ score is through simple formulae. Calculation of the final QQ score requires knowledge of length the respondent’s working day. The score interpretation as hours of work lost can be used to estimate productivity losses and associated costs.

The Utrecht Work Engagement Scale (UWES) [33], Work Limitations Questionnaire (WLQ) [34] and the Work Experience Survey (WES) [35] can be used to identify limitation and targets for rehabilitation. UWES measures work functioning and engagement and requires between 5 and 10 minutes to complete [33]. UWES uses 17 items with Likert scale responses to score three aspects of work engagement: vigour (six items; one example - ‘At my work, I feel bursting with energy’); dedication (five items; one example - ‘I find the work that I do full of meaning and purpose’); and absorption (6 items; one example - ‘Time flies when I'm working’ and five other items) [33]. WLQ measures function and limitation and also requires between 5 to 10 minutes to complete [34]. WLQ asks ‘In the past 2 weeks, how much of the time did your physical health or emotional problems make it difficult for you to do the following?’ with 25 items (for example ‘do your work without stopping to take breaks or rests’ and ‘keep your mind on your work’). The questions correspond to four scales (time management, physical demands, mental-interpersonal demands, and output demands) which are scored individually to indicate the extent of work limitation (such as all of the time or none of the time). One limitation of the WLQ is that no limitation is assigned if a task is not applicable in the respondent’s job (for example due to having made work adaptations), which may lead to underrepresentation of work limitation. Selection to use this instrument may be dependent on whether the functional tasks included in the instrument are relevant to those completing the instrument. If so the work tasks remain the same when measured at time, this instrument may capture change over time.

The aims of the WES are to identify and propose solutions to barriers threatening continuation of employment [35]. The WES is administered by interview with a health professional and will take thirty to sixty minutes to complete. The interview begins with an evaluation of accessibility problems at work, followed by identification of job functions that are essential but pose problems and explores modifications that would be helpful to maintain work functioning. Health professionals can work with employers to implement the accommodation(s) that are considered to be feasible and affordable.

From a societal perspective the rate of employment (the percentage of working age adults (e.g. age 16-64 (UK) or age 15-74 (EU)) who are in paid work) provides a sense of the success of national and international policy. An alternative approach to population monitoring uses health expectancy indicators, which combine information about morbidity with mortality rates to give the number of years expected to be lived in a given health state. For example, Disability Free Life Expectancy (DFLE) estimates the number of years expected to be lived free from disability (long-standing limiting illness). Although there have been large increases in life expectancy in many countries, changes in health expectancy have been less clear and less consistent as chronic health problems such as RMDs are becoming more prevalent [36]. As retirement ages rise with life expectancy and people are expected to contribute more years of paid work and taxation, health expectancy indicators such as Healthy Working Life Expectancy (HWLE; defined as the average number of years people are expected to be healthy and in work from age 50) can be used to monitor whether, on average, people are able to extend their heathy working lives and the extent to which additional years prior to retirement are affected by absenteeism and presenteeism or worklessness [37].

*Work-life balance*

Health professionals, in their work with people with RMDs, must acknowledge the need for balance between work participation and other life roles, tasks and demands [38-41]. Where work is highly valued or necessary to provide financial resources and benefits, the impact of coping and managing the symptoms (e.g. (pain, fatigue, physical limitation) of RMDs, which may be exacerbated through maintaining work productivity, may impact on other social roles and activities [38-41]. Work participation can lead to role conflict (for example, work demands interfere with the time required to care for RMD symptoms, such as adequate rest to let joints and muscles recover from stress) and role loss (plans with family and friends were cancelled to facilitate work participation [42]. The increased stress of managing role overload can then lead to reduced job satisfaction, increased absenteeism and presenteeism, job change and lower mental health [40]. Strategies to manage work in the context of life roles and activities are required to maintain improvement in work participation.

*Models of work participation*

Improving work participation requires recognition of the factors that lead to work loss and participation and their interplay. Two frameworks are presented as examples of how to organise thinking about barriers and facilitators for work participation; the work disability case management ecological model [43] and an expanded version of the World Health Organisation’s International Classification of Function Disability and Health (WHO-ICF) for work [44].

Models of work participation encourage biopsychosocial approaches to improving work participation and a multi-disciplinary approach. As outlined above the role of work on life balance is unique and health professionals must acknowledge that each person’s disease and work experience is unique and highly influenced by the social environment such as the support he/she receives in the workplace and the family environment. Promotion of work participation and/or designing a rehabilitation plan, requires assessment of the biopsychosocial factors that can lead to prolonged work disability [45]. A large knowledge base about these factors is available from numerous studies and reviews on disability and return to work factors [e.g. 46]. Some key elements for a healthy and quick return to work have been suggested and evidence has emerged from several high-quality studies suggesting shifting the rehabilitation process directly into the workplace [47,48]. Evidence shows, for instance, that graded and controlled return to regular work with good social support in the workplace may speed up recovery from chronic low back pain [49]. At the macro-organization level, an important determinant for success of return to work programs is the workplace health and safety culture. As mentioned by Franche and Krause [50], the values shared by the people at an enterprise can shape the level of interaction between them, and this can influence the determination of goals and objectives of return to work programs. In certain situations, production demands may pose a problem to work participation. In this case, supervisors and employers may be committed to improve productivity without realizing the impact of an increased production to workers during their recovery process. The application of ergonomics is recognized to be a potential approach to balancing the interests of employer/supervisor on one side (productivity, profit and regulation compliance), and the interests of the worker (recovery, comfort and well-being) on the other. Organizations that have adopted appropriate on-going ergonomics programs are dealing with less conflict-of-interest between these two actors and are able to handle job accommodations or gradual return to work effectively [51].

It is evident that, in complex cases, the process of returning to and sustaining in work can present challenges not only for health professionals but to employers and insurers as well. Thus, it is essential that all parties, including the patient, work together to achieve the common goal of a safe and sustainable return to work. In view of these challenges, a case management ecological model has been proposed (Figure 1) and its clinical utility shows promising results [52]. This model highlights the range of social factors involved in the disablement or enablement process after an illness or injury. It has been used in several countries as a guide tool to target the barriers to return to work that may exist within the four systems: i.e. the personal, the workplace, the compensation/insurance and the workplace systems. A semi-guided interview has been developed to support the identification of these barriers [53]. This is the first model with proven clinical utility in which the worker with temporary work incapacity is placed at the centre around the various social structures of all the systems including the overall political, economic and cultural climate that may affect the decision to work participation. This model also considers the evidence on how fear-avoidance behaviour is associated with the development of musculoskeletal pain and as such it recognizes that healthcare providers’ communication with worker may positively or negatively influence the decision and fear to return to work [52]. A lack of communication between health professionals and the workplace actors may also have a negative effect on return to work [50]. Moreover, the compensation system sometimes generates adversarial legal actions that have been shown to have a deleterious effect on work participation [43].

Variations of a case management ecological model have been tested in several randomized trials and proven effective in reducing days out of work, in helping workers remain at work after injuries and in reducing costs related to work disability [53]. The main proposition of the model is to bring to the individual with a RMD a coherent, organized evaluation and case management approach, delivered in close collaboration with the employer and the insurer. However, reassuring explanations to the individual with a RMD about work activities and close links with the workplace are considered key components for its success.

The second model to highlight is the WHO-ICF framework which integrates the social perspectives of “human activities” and “participation” with the clinical understanding of “body functions, and structures” [44]. It provides health professionals information on the essential factors for targeting “functioning” as a matter of how a person affected by an illness or disease responds to life activities and social participation. The WHO-ICF framework proposes an important understanding of the unique experience of an illness and how that illness may impact individual’s functioning and social participation. Dutch researchers proposed an extended version of the WHO-ICF that adds information on the workplace environment with its micro, meso, and macro determinants (Figure 2). It includes an element called “work conditions” which are the physical hazards present in the work environment such as vibration, noise, air quality, radiation, biological and chemical agents, and ergonomic workplace design aspects. The clinical utility of this model is yet to be demonstrated in different contexts; however, given the already widely established recognition of the WHO-ICF and its tested instruments, this version is a promising model as it may help health professionals to consider short-term and long-term effects of “work factors” and “working conditions”. According to this model, psychosocial factors and work environment factors (i.e., micro, meso, or macro work demands) should be carefully considered side-by-side with the person’s functions, activity limitation, and responses to work participation [44]. The environmental factors are referred to as external factors of an individual’s life, and they include physical, social, and attitudinal environments. These can also include how healthcare and compensation systems are provided. These factors can either have a negative or a positive influence on a person’s performance in work-life and on an individual’s ability.

It is important to recognize that the methodological complexity of studying work factors make it difficult to include in a single model all the possible targets for managing RMDs in the workplace. In addition, the changing nature of the workplace system due mainly to variations in work demands, introduction of new technologies and business cycles presents a challenge for health professionals to identify how to improve work participation. There are other models that may offer more details on workplace system structures than the two models presented [45]. One example is the Institute of Medicine (IOM) biopsychosocial model of musculoskeletal disorders in the workplace [55]. The IOM model describes the “person–environment” interface based on the extensive research on biomechanical models and the epidemiology of injury causation to explain outcomes such as work participation. However, the IOM and other ergonomics-focused models have not yet been tested and used in clinical practice and may be more useful for professionals that are able to intervene directly on work demands and work processes.

*Interventions by health professionals*

The models indicate that work participation and return to work is a complex process in which healthcare professionals are usually not alone in dealing with its complexity. When it comes to providing quality services, it is important to rely on the evidence related to work factors to prevent and manage disability. The services that are developed should not only monitor and evaluate the recovery process in the workplace but also will optimize employability and work-life balance of affected individuals with RMDs. The focus for interventions that can be delivered by health professionals should be on overcoming barriers that prevent return to or stay in work. These barriers are often a result of the mismatch between the individual who wants to stay at work or return to work following sick leave or job loss, and the mechanisms allowing them to do so [56]. As outlined in the models, the barriers could include for example an experienced lack of workplace support, too much stress or demands related to the work tasks or a non-functioning relationship with supervisors and coworkers.

Currently there are a number of interventions aimed at improving work participation that are being evaluated for their effectiveness, including interventions focusing on the physical environment, the individual’s skills and or cooperation between the stakeholders in the process of returning to work. The interventions can be offered by the multidisciplinary team, including for example occupational therapist, physiotherapist, psychologist and nurse, with further facilitation by single health professionals. Multidisciplinary biopsychosocial rehabilitation programs (MMRPs) involve physical components, one or more psychological components, and work targeted components delivered by clinicians with different professional backgrounds [57]. Evidence-based MMRPs provide a multi-professional foundation, however more specific knowledge about which components are effective and how to plan and implement these interventions to increase return to work are required [58, 59]. Factors that promote work participation in people with RMDs include mobilizing personal resources, balancing daily life, partaking in constructive communication with line managers and employers and the potential contribution of co-worker support [60]. This, again, emphasises that employers are important stakeholders in maintaining and increasing work participation; workplace accommodations and collaboration in managing work participation is key to return to work [56]. As highlighted previously, workplace-centred interventions are more effective for improving work participation than interventions performed outside the workplace [61,62]. An active role of employers, through the amount and quality of contact with employees and adherence to organisational policies, illustrating good employee-employer relationships, is viewed by employees as important for maintaining and improving work participation [63]. Therefore, interventions need to be emphasised that encourage communication and trust and create an environment conducive to maintaining and improving work participation in including workplace support. Employer support, when continuous, motivates workers to reduce absenteeism and improve work productivity are of increasing importance when RMDs are present (that is work participation is maintained in the presence of RMDs) [58]. Employers must view themselves as part of the multidisciplinary team and improve their approach to maintaining work participation. In addition health professionals can also develop links with additional stakeholders (e.g., the Social Insurance Office and the Public Employment Service) in the return-to-work process. This type of collaboration is highly supportive for people with RMDs to return-to-work after rehabilitation programmes [59].

**Opportunities to further work participation for people with RMDs**

There are two particular approaches that are worth highlighting not only for their potential to improve work participation for people with RMDs but also to transform how health professionals can achieve this.

The first is the use of digital technologies. Continued work participation with ongoing RMDs can provide ongoing challenges for those with the RMDs (who may require on-going support) and employers (many of whom will be small or medium sized employers with limited resources to support workplace accommodations). Digital interventions offer the potential to support work participation and collaboration between different stakeholders involved in maintaining work participation [64]. Features that have been identified as strengths are the ability to download content for future use and reading other patients’ experiences about return-to-work [65]. Online communication between the people with RMDs, the employer or other stakeholders has been found to provide important support for maintaining/improving work participation and improving the compliance [66]. It facilitates both the interactivity and possibility to tailor the return-to-work support for individual patients. It can be used as a part of or a complement to health care can be a cost-effective way of delivering coordinated return-to-work interventions for persons with RMDs [64].

The second is the potential to enhance vocational rehabilitation. Vocational rehabilitation is a complex intervention which responds to the numerous barriers and enablers to work participation; the process of vocational rehabilitation is to overcome the barriers that individual’s face when assessing, remaining or returning to work following a RMD [56]. Early interventions when RMDs begin to impact on work may be important for maintaining work participation and will be best placed in primary care or at first point of contact [67, 68]. Interventions that shift the focus from less effective medical care to more attention to resolving work disability can not only improve RTW, but also reduce health care costs and improve quality of life [69]. Vocational rehabilitation provides opportunities to enhance the opportunities for health professionals to enhance work participation; this requires health professionals to have knowledge of the models of work participation and skills and expertise in vocational rehabilitation to allow them to deliver advice and support to people to remain in work. Ideally vocational rehabilitation should be delivered in primary care to minimise work loss. Health professionals, such as physiotherapists and occupational therapists, may be best placed to provide vocational support as their training and focus on function has a better fit with improving work participation than those whose medical training has not included information on how to manage people’s concerns about work [70]. A recent trial suggests that embedding dedicated vocational advice services in primary care for patients with musculoskeletal disorders can be a cost-effective strategy to reduce sick leave [64]. The intervention was delivered by physiotherapists and focused on the psychosocial flags framework, focusing on three areas; psychological or behavioural obstacles to work (yellow flags – beliefs about pain, illness behaviour), work perceptions (beliefs about the physical and social impact of work on health (blue flags) and context factors (objective working conditions and characteristics (black flags) [64]. The service was low intensity and based on the principles of case management using a stepped care model to develop a goal orientated approach to remaining or returning to work; the vocational advisor and patient jointly developed a plan to manage health and work issues to support the patient in addressing work obstacles, with regular review. Medical staff continued to be part of the management of clinical problems. Compared to usual care this intervention led to less absence (i.e. on average 5 days less absence over 4 months). The potential societal benefits are substantial; in this trial, net societal benefit of the intervention compared to best care was £733 and wide implementation of the intervention could reduce work absence by 16% [64]. Vocational rehabilitation, provided by occupational therapists is also an acceptable intervention for people with inflammatory arthropathies and can lead to reduced work limitation [71]. The success is dependent on the knowledge of the health professional acting as a vocational advisors.

**Knowledge gaps, future research and challenges**

Improving work participation is one area where there is a need for more research, both observational and experimental. There is a need for more good-quality evidence to guide the preventive, therapeutic and rehabilitative arms for improving work participation for people with RMDs. Better identification of those who require preventative measures or who are at risk of poor work outcomes indicates a need for further epidemiology of work in people with RMDs. One way to do this is to embed work as an outcome in all research studies and clinical work in working age adults and to pool data from multiple studies to generate large datasets. This could be helped through consensus on how to best measure work outcomes such as absenteeism and presenteeism, with linkage to economic data. Artificial intelligence and the development of longitudinal modelling methods may improve the ability to identify those at risk of poor work outcomes and improve the rehabilitation process.

Now that a biopsychosocial and multidisciplinary approach to improving work participation is gaining recognition as the best approach, further information is needed about the timing of interventions to ensure optimal outcomes. This may extend to understanding when individuals with RMDs seek help to maintain or improve work participation either through the development of general incapacity or the development of productivity loss or work absence. Identifying the most appropriate gatekeeper for management and when different health professionals should work with patients and employers will increase the efficiency of the rehabilitation process.

The potential contribution of health professionals requires further examination in developing interventions for improving work participation. The evidence that physiotherapists as vocational advisors is beneficial, is a starting point [64]. The lack of leadership with the vocational rehabilitation process indicates the need for physiotherapists, occupational therapists and nurses to be first point of contact and have greater authority on the management of work problems for people with RMDs. The ability of health professionals to lead improvements in work participation can be enhanced through the development of specific training in undergraduate programmes, and with an expansion in focus from just health and illness to include work and function.

How to empower people with RMDs to stay in work is also an important challenge and with the potential size of the problem may require new public health and policy approaches. The development of apps has great potential to facilitate this; testing their effectiveness is important to aid selection. Greater understanding of the needs of managers to improve workplace support for people with RMDs will also further enhance the multidisciplinary approach to improving work participation. For example this would enhance collaboration between occupational therapists and employers to provide work station adjustments. Notably this could be more challenging for small to medium sized employers who will not have the resources and structures in place to readily offer support. This again indicates a need for a population level and policy approach to facilitate improvements in work.

**Summary**

The ability to effectively manage RMDs, and to reduce their impact by continuing a productive work and life for people is important for health professionals. Measuring work as an outcome can facilitate an increased approach to improving work outcomes for people with RMDs; there are instruments with sufficient psychometric properties that support use by health professionals to measure absenteeism, presenteeism and to identify targets for rehabilitation. There is increasing evidence to support a biopsychosocial and multidisciplinary approaches to improve work outcomes for people with RMDs. Increasing linkage between health professionals and employers with work centred rehabilitation is proving to be useful in improving work outcomes. There is now great potential for health professionals to lead improvements in work outcomes through development of roles and use of technology. The potential for people with RMDs to maintain/increase productivity in life and work is increasing along with the extensions to healthy working life.

**Practice Points**

* Organise the factors that facilitate or are barriers to work participation within a biopsychosocial model to identify targets and which professionals are best placed to improve outcomes
* Health professionals should work as part of a multi-disciplinary team, including the employer, to improve work outcomes
* Evidence suggests that early intervention and shifting the rehabilitation process into the workplace leads to better work outcomes

**Research Agenda**

* Embed work outcomes in all research studies to provide data that can drive improvements in work participation.
* More observational data collected over time can facilitate studies of prognosis and identification of people with RMDs who are most at risk of poor work outcomes
* More experimental data can continue to inform how health professionals can improve work participation in people with RMDs
* If extensions to working life are to be realised, methods for measuring are required. Healthy working life expectancy offers potential to do this but requires further evaluation.

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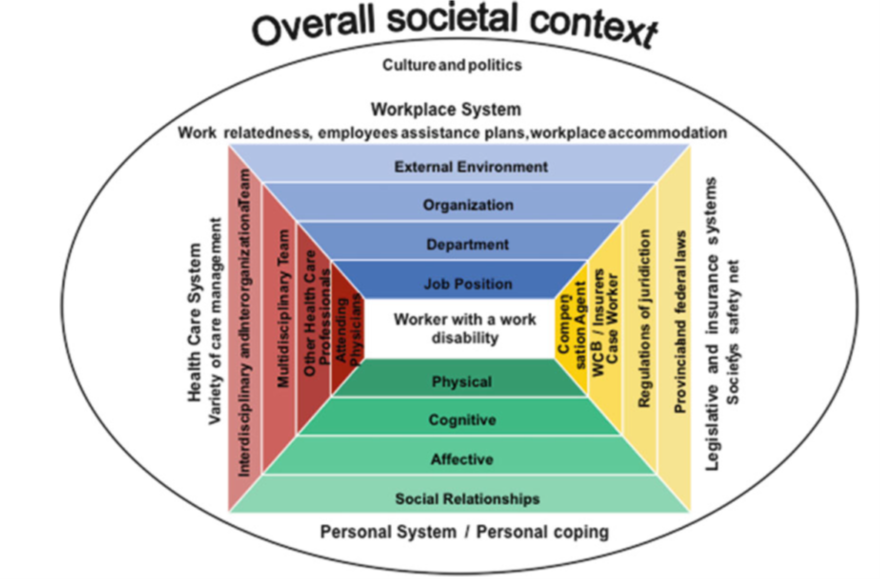
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**Table 1: Examples of instruments that can be used by health professionals to measure work outcomes**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Indicator** | **Purpose** | **Content** | **Method of administration** | **Respondent burden** | **Score(s) and interpretation** |
| Health and Labor Questionnaire (HLQ) | To measure work absence, productivity, unpaid work and limitations to paid/unpaid work | Four modules of questions relating to: 1.Absence from paid work 2.Reduced productivity at paid work 3.Unpaid work 4.Impediments to paid and unpaid labour | Self-completion questionnaire | 10 minutes | Presenteeism is interpreted from a low reduced productivity score (6-24). Absenteeism is interpreted as working days lost over two week period. |
| Quantity and Quality method (QQ) | To measure the effect of illness on work | One question asking for quantity of work carried out in a day compared to normal and one question asking for quality of work carried out in a day compared to normal quality level (both responses on visual analogue scales from 1-10) | Self-completion questionnaire | Minimal (not reported) | Quantity of work lost (absenteeism) is calculated using the response to the quantity question and number of hours in one working day. Quality of work lost (presenteeism) is calculated using the response to the quality question and the number of hours of work achieved (quantity not lost). Quality and quantity lost are summed to give hours of work lost. |
| Stanford Presenteeism Scale (SPS)  *(P)* | To measure presenteeism with a concise tool | Six questions (SPS-6) with 5 point Likert scale responses | Self-completion questionnaire | Minimal (not reported) | One score (5-30) with higher values indicative of high levels of presenteeism |
| Utrecht Work Engagement Scale (UWES)  *(P)* | To measure work engagement | 15 or 17 questions with 7 point Likert scale responses | Self-completion questionnaire or interview | 5-10 minutes | Scores for each of three aspects of work engagement (vigor (6 items), dedication (5 items), and absorption (6 items)) with lower scores indicative of less engagement |
| Work Ability Index (WAI)  *(A,P)* | To assess work ability | Seven questions with Likert (range 4-11 point) scale responses | Self-completion questionnaire | Minimal (not reported) | One score (7-29) with thresholds for interpretation of poor, moderate, good and excellent work ability |
| Work Experience Survey (WES)  *(A,P)* | To identify and plan accommodations for barriers to career maintenance | Six sections of questions with multiple choice, free text and Likert scale responses: 1. Background, disability and work experience 2.Accessibility 3.Essential job functions 4.Job mastery 5.Satisfaction 6.Review and consider solutions to barriers | Structured face-to-face or telephone interview | 30-60 minutes | *A rehabilitation professional is required to administer and interpret the survey* |
| Work Limitations Questionnaire (WLQ)  *(P)* | To identify the presence of and degree to which people in paid work experience limitations due to health | 25 questions with 6 point Likert scale responses forming four scales: 1.Time management 2.Physical demands 3.Mental-interpersonal demands 4.Output demands | Self-completion questionnaire or (telephone) interview | 5-10 minutes | Scores on each of the four scales are indicative of limitation none of the time (low responses) - all of the time (high responses) |
| Work Productivity and Activity Impairment Questionnaire (WPAI) (general health version)  *(A,P)* | To assess amount of absenteeism, presenteeism and daily activity impairment attributable to general health | One question about employment status, three self-report questions of hours worked/not worked and two questions with visual analogue scale responses (0-10) | Self-completion questionnaire (interviewer administered version also available) | 2-5 minutes | Four scores: 1.Percent work time missed due to health 2.Percent impairment while working due to health 3.Percent overall work impairment due to health 4.Percent activity impairment due to health |

**Figure 1: The ‘work disability prevention case management model’ extracted from Loisel et al 2001**



**Figure 2: WHO–ICF extended and applied to work (Heerkens, Y. et al. 2004)**

