

# Identifying patients with chronic widespread pain in primary care

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## Abstract

Chronic widespread pain (CWP) is common in the general population. It is unclear how people reporting this problem present in primary care; they may regularly consult for regional pains without being recognized as having a generalized condition. Our objectives were to determine the prevalence of people consulting in primary care for musculoskeletal conditions in different body regions on different occasions (recurrent regional pain consultation), the proportion with diagnosed generalized pain and survey-reported widespread pain, and if they have features characteristic of CWP. Phase 1 used electronic records from 12 general practices in North Staffordshire (Consultations in Primary Care Archive) from 2005 to 2009. Phase 2 used linked self-reported health and primary healthcare data from 8,286 people aged 50 plus in eight general practices (North Staffordshire Osteoarthritis Project) between 2002 and 2005. In Phase 1, 11% of registered patients fulfilled criteria for recurrent regional pain consultation. Three-quarters had no recorded CWP-related generalized pain condition (e.g. fibromyalgia). In Phase 2, 53% of recurrent regional pain consulters had survey-reported widespread pain and 88% had consulted for somatic symptoms. Self-reported general health was worse in recurrent regional pain consulters than in single-region consulters, and poorest in those who also reported persistent widespread pain. Recurrent regional pain consulters are a heterogeneous group of frequent consulters sharing features with CWP (e.g. somatic symptoms) but including those less severely affected. They lie on the spectrum of polysymptomatic distress characteristic of CWP and represent a group whose needs may be better met by earlier diagnosis of multi-site pain.

**Keywords:** chronic widespread pain; electronic health records; Primary Care

## Introduction

Chronic widespread pain (CWP) is characterized by long-lasting pain in multiple body regions, and is associated with other physical symptoms such as fatigue, concentration problems, and psychological distress. CWP is common, with an estimated general population point prevalence of 10%.[26]

In the American College of Rheumatology 1990 (ACR-1990) definition,[42] CWP is the fundamental feature of fibromyalgia, defined as pain lasting three months or longer, located axially, above and below the waist, and on both sides of the body. The updated definition (ACR-2010)[41] emphasizes additional physical symptoms (e.g. fatigue, waking unrefreshed) associated with fibromyalgia and placed fibromyalgia at one extreme on a spectrum of polysymptomatic distress that includes CWP.

Due to the range of symptoms experienced and a multidisciplinary approach to treatment, it has been argued that fibromyalgia and CWP should be managed in primary care.[9,11,12,32,34] However, general practitioners (GPs) may not recognize fibromyalgia as a valid diagnosis,[1,6,22,23] may receive inadequate formal training in fibromyalgia,[1,7,22] and may have limited awareness of diagnostic criteria.[6,7,22] Most UK primary care uses Read codes to summarize patient encounters within electronic records.[3,35] There is no Read code for CWP, although the syndrome will be included in the forthcoming ICD-11 classification of disease.[8] However, whilst a code does exist for fibromyalgia, the disparity between its estimated community and primary care prevalences suggests that the label of fibromyalgia is not often used in general practice.[10,16] This may reflect the controversial nature of fibromyalgia and CWP, or concern about the wider implications of labeling.[2] Patients fulfilling CWP criteria may instead be diagnosed and treated in primary care for individual regional pains (for example, knee pain), rather than for a generalized pain condition.[33]

Electronic health records (EHRs) present opportunities to study health care in large cohorts with many years of follow-up. However, using EHR data relies on the definition of robust clinical phenotypes.[14] Rohrbeck and colleagues[33] mapped the ACR-1990 CWP criteria to primary care consultation patterns for regional musculoskeletal complaints based on a select number of regional musculoskeletal pain Read codes in one general practice (Box 1). Patients identified using this recurrent regional pain consulter definition consulted for more health problems, and reported worse self-reported general health, more sleep problems, and higher levels of fatigue than controls, and were concluded to be potentially unrecognized as having a more generalized condition. If GPs do treat the condition presented at each consultation as a regional problem only, then early opportunities for interventions aimed at generalized pain may be missed and long-term disability exacerbated by incomplete management. A consultation-based CWP definition may prompt earlier identification of patients and more timely management. It would also allow estimates of CWP prevalence, health surveillance, and monitoring of trends over time.

Building on earlier work,[33] our objectives were to: i) determine the prevalence of recurrent regional pain consultation in primary care; ii) assess the extent to which such patients may be under-recognized as having widespread pain; and iii) determine whether they share features characteristic of CWP.

## Methods

The study consisted of two phases. In Phase 1 we used routinely recorded primary care data to investigate prevalence of recurrent consultation for regional pain conditions and determined the overlap with recorded non-specific generalized pain that may be related to fibromyalgia, to assess the extent to which widespread pain may be unrecognized in UK primary care. In Phase 2 we used linked survey and primary care consultation data to investigate whether patients with recurrent regional pain consultation have survey-reported CWP and have similar characteristics to those self-reporting CWP.

### *Phase 1*

We used anonymized routinely collected primary care data from general practices contributing to the Consultations in Primary Care Archive (CiPCA) in North Staffordshire, UK. The North Staffordshire Research Ethics Committee gave ethical approval for the use of the CiPCA database for research (reference 03/04). In the UK, 98% of the population are registered with an NHS GP,[15] access to care is free, and GPs act as the entry point to all routine healthcare. Although North Staffordshire is more deprived than the average for England, the practices cover both affluent and deprived areas. Routine clinical data recorded by the practices are regularly audited.[30] Prevalence of musculoskeletal conditions in CiPCA has been demonstrated to be similar to that of larger national primary care consultation databases[17] and international databases.[19] We included the 12 CiPCA practices for which there was complete data for the years 2005–2009, with a denominator population base of 79,796 people registered (all ages, with full registration for the five-year study period).

We used the Read coded consultation data for this 5-year period to identify: i) patients fulfilling the original recurrent regional pain consultation algorithm (Box 1) based on a published list of all regional musculoskeletal morbidity codes (n=4,482);[20] and ii) individuals recorded with non-specific (i.e. with no clear established underlying diagnosis) generalized pain conditions related to CWP. These included fibromyalgia, fibrositis, rheumatism, myalgia, arthralgia, and polyalgia. The code lists are available from [www.keele.ac.uk/mrr](http://www.keele.ac.uk/mrr). We excluded patients without complete registration; that is, those who were not registered with the same primary care practice for the full five-year period from 2005 to 2009.

### **Analysis**

We calculated the five-year recorded prevalence of recurrent regional pain consultation, fibromyalgia, and non-specific generalized pain, as well as the total prevalence of recurrent regional pain consultation or generalized pain combined. We also re-calculated total prevalence (of recurrent regional pain consultation or non-specific generalized pain combined) after excluding those with specific generalized musculoskeletal diagnoses (i.e. rheumatoid arthritis, systemic lupus erythematosus, polymyalgia rheumatica, ankylosing spondylitis, Sjögren's syndrome, hypothyroidism) during the five-year period. The denominator population was patients registered with the CiPCA practices between 2005 and 2009. We directly standardized

prevalence figures using the UK general population age and sex distribution for 2009 provided by the Office for National Statistics.

We then calculated the percentage of recurrent regional pain consulters recorded as also consulting for a non-specific generalized pain complaint and the percentage of non-specific pain consulters who were also recurrent regional pain consulters.

## *Phase 2*

The Phase 2 study population was drawn from the North Staffordshire Osteoarthritis Project (NorStOP), a prospective study of pain and general health of all community-dwelling adults aged 50 years and over registered with eight general practices.[37] The North Staffordshire and Hereford and Worcester Research Ethics Committees granted ethical approval for the NorStOP project. We included those who had responded to both baseline and three-year postal health surveys from the three identically recruited and measured cohorts (NorStOP 1: 2002, NorStOP 2: 2003, NorStOP 3: 2004, 2005), had consented to medical record review, and had a minimum of five years of medical record data available. Questionnaires were mailed with a letter from the GP practice, accompanied by a study information leaflet, and reminders were sent to non-responders after two and four weeks. GPs checked mailing lists prior to mailing to exclude unsuitable patients (for example, patients with terminal illnesses or dementia). Full details of the study protocol and data collection have been published previously.[37]

### **Pain status**

We established consultation-based pain status using linked primary care medical record data for the five-year period starting two years prior to the baseline health questionnaire. We identified those fulfilling the recurrent regional pain consultation algorithm and those consulting for musculoskeletal problems in a single region (recorded as consulting in just one of the three defined body regions – axial, upper limb, or lower limb – during the five-year study period).

Self-reported pain status was collected by postal questionnaire at baseline and three-year follow up. A self-completed body manikin was used to establish the location of body pain lasting for one day or longer in the past four weeks. Pain diagrams have been demonstrated to be a reliable means of classifying widespread pain based on existing criteria.[24] ACR-1990 widespread pain was defined as axial pain, pain in the left and right sides of the body, and pain above and below the waist.[42] Owing to the limitations of the self-reported data, we were unable to ascertain chronicity using the ACR-1990 definition of three months duration or longer. Widespread pain reported at both baseline and three years was therefore used as a marker of 'persistent' widespread pain. Self-reported widespread pain was classified into two categories as:

1) ACR-1990 widespread pain at baseline *or* three years; and 2) ACR-1990 widespread pain at baseline *and* three years (persistent widespread pain).

### General health measures

Consultation-based measures were collected from medical records over the five-year period. These were: somatic symptom count, frequent attendance, and musculoskeletal and non-musculoskeletal consultation counts.

CWP is often associated with additional symptoms such as fatigue and concentration problems. The ACR-2010 fibromyalgia definition[41] emphasizes the importance of these somatic symptoms by including them in the fibromyalgia case definition. We identified the number of somatic symptoms (e.g. fatigue, insomnia, and nausea) recorded for each patient over the five-year study period. We used the symptoms itemized in the ACR-2010 fibromyalgia criteria to identify corresponding Read codes.

CWP patients have been found to consult more frequently than patients with no pain, independent of their level of psychological distress,[21] suggesting that frequent attendance is a feature of CWP. Research has demonstrated an association between CWP and help-seeking behavior for health problems.[13] We defined a frequent attender status as being in the top 10% of consulters for non-musculoskeletal problems over the five-year period. Frequent attendance defined in this way is also an indirect measure of comorbidity. Non-musculoskeletal consultations were defined as primary care contacts recorded with any Read code (including numeric Chapters 0–9: history, examination, procedural and administrative codes, and Chapters A–Z: diagnostic codes) except the musculoskeletal codes.[20]

We collected self-reported health status from baseline health questionnaire responses. General health was assessed using the SF-12 physical health component summary score.[39] Psychological health was assessed using the anxiety and depression scores of the Hospital Anxiety and Depression Scale (HADS).[43] Cognitive impairment was measured using the alertness subscale of the Sickness Impact Profile (SIP).[5] Sleep was assessed by four questions, in which respondents were asked if they had the following sleep problems on most nights: i) trouble falling asleep; ii) waking at night; iii) trouble staying asleep; and iv) waking up tired. A positive response to any of the four sleep questions was used to indicate a reported sleep problem.

### Analysis

We descriptively compared recurrent regional pain consulters, those who consulted for pain in a single region (axial, upper limb, or lower limb), and all respondents with self-reported persistent widespread pain by age, sex, consultation-based health measures, and self-reported health measures. We then determined the positive predictive values of the recurrent regional pain consultation definition for each of the self-reported widespread pain definitions.

For the main analysis we compared different patterns of pain consultation with self-reported persistent widespread pain status (defined as having ACR-1990 widespread pain at both baseline and three years), by consultation-based health measures and self-reported health measures. Specifically, we compared the following four mutually exclusive groups of patients: A) recurrent regional pain consulters who also reported persistent widespread pain; B) recurrent regional pain consulters who did not report persistent widespread pain (but may have reported widespread pain on either baseline or three-year surveys); C) respondents reporting persistent widespread pain but not meeting the recurrent regional pain consulter definition; and D) single-region consulters not reporting persistent widespread pain. For this analysis, single-region consulters not reporting persistent widespread pain were the control (reference) group.

We compared these four groups on frequent attendance, recording of one or more somatic symptoms, reporting one or more sleep problems on most nights, SF-12 physical component summary score, SIP cognitive impairment score, and HADS anxiety and depression scores, using logistic or linear regression as appropriate, and adjusting for age and sex.

## Results

### *Phase 1*

The five-year denominator (all ages) in CiPCA was 79,796. 9,172 patients fulfilled the recurrent regional pain consultation criteria and 6,466 patients were recorded with non-specific generalized pain conditions

### **Prevalence**

Standardized five-year consultation prevalence ranged from 0.36% (95% confidence interval [CI] 0.32%, 0.40%) for recorded fibromyalgia to 14.61% (95% CI 14.36%, 14.86%) for the combined prevalence of recurrent regional pain consultation or a code recorded for a non-specific generalized pain condition (Table 1). Five-year prevalence of recurrent regional pain consultation was 9.87% (95% CI 9.66%, 10.07%). The age and sex distribution of recurrent regional pain consultation was similar to that of non-specific generalized pain conditions, except that prevalence dipped slightly for non-specific generalized pain consultation in the highest age band but continued to increase for recurrent regional pain consultation (Figure 1).

### **Overlap of recurrent regional pain consultation with non-specific generalized pain**

Of the 6,466 patients with a record of a non-specific generalized pain condition, 290 (4%) were recorded with a specific fibromyalgia code. Thirty-three percent (2,106/6,466) of non-specific generalized consulters also fulfilled the recurrent regional pain consulter definition. The recurrent regional pain consultation algorithm identified 42% (123/290) of those recorded with fibromyalgia codes. Twenty-three percent (2,106/9,172) of recurrent regional pain consulters had a recorded non-specific generalized pain condition.



## Phase 2

Of 26,129 eligible participants at baseline, 71% (n=18,497) responded to the baseline health survey questionnaire. Of those consenting to follow-up and still registered with the GP (n=11,900), 81% (n=9,665) responded to the three-year follow up questionnaire. Of the 9,665 people responding to both baseline and three-year questionnaires, 9% (n=831) did not consent to medical record review and 6% (n=548) had access to less than five years of medical record data available, leaving 8,286 participants eligible for inclusion in this study (**Supplementary Figure S1**).

Incomplete responders (either baseline-only responders or baseline and three-year responders without five years of medical record data) showed generally small differences from the study population on all baseline variables assessed (**Supplementary Table S1**). Non-responders at baseline were slightly older (mean difference = 0.86 years, 95% CI 0.53, 1.18), and more likely to be male (non-responders: 49% male; study population: 46% male, percentage difference: 3.15%, 95% CI 1.59%, 4.71%) than the study population.

Of the 8,286 individuals in the study population, 85% (n=7,076) self-reported musculoskeletal pain at either baseline or three years. Two thousand, eight hundred and three (35%) reported ACR-1990 widespread pain on one or both surveys, of whom 1,190 (14% of all the study population) reported ACR-1990 widespread pain at both baseline and three years (persistent widespread pain).

Eighty percent (6,611/8,286) of the study population had at least one recorded musculoskeletal consultation in the five-year period. Twenty-two percent (n=1,786) of the population were identified as recurrent regional pain consulters, and 24% (n=1,979) consulted for a musculoskeletal problem in only one region during the five-year study period.

### Patient characteristics

Descriptive statistics for participants with recurrent regional pain consultation and/or self-reported persistent widespread pain are presented in **Table 2**. Mean age was similar (64 to 65 years) across pain definitions. Sixty-four percent of patients with self-reported persistent widespread pain were female, which was similar to the figure of 61% observed in recurrent regional pain consulters. Eighty-eight percent (n=1,567) of recurrent regional pain consulters had at least one recorded consultation for a somatic symptom, compared to 81% (n=963) of those with persistent widespread pain. In participants consulting for a single region, 48% were female, mean age was 64, and 62% (n=1,111) self-reported persistent widespread pain.

### Agreement between consultation-based and self-reported pain status

**Table 3** shows the agreement between consultation-based pain status and self-reported pain status.

Virtually all recurrent regional pain consulters (97%, n=1,727) had self-reported pain. Fifty-three percent (942/1,786) of recurrent regional pain consulters reported widespread pain on one or both surveys, while



25% (445/1,786) reported persistent widespread pain at both baseline and three years. Patients recorded as consulting for single-region (axial, upper or lower limb) pain reported less widespread pain than recurrent regional pain consulters – with 27% (532/1,979) reporting widespread pain on one or both surveys, and 10% (194/1,979) reporting widespread pain at both baseline and three years. Recurrent regional pain consulters represented 37% (445/1,190) of those reporting persistent widespread pain. However, individuals from the large group who consulted with more than single-site musculoskeletal pain but who did not meet the definition for recurrent regional pain consultation (other musculoskeletal consultations) represented 40% (473/1,190) of those reporting persistent widespread pain.

The single-region controls without self-reported persistent widespread pain had the best consultation-based and self-reported health. The two groups of recurrent regional pain consulters had the most severe consultation-based health on all measures, with those also reporting persistent widespread pain having the worst consultation-based health (**Table 4**). For example, the odds of being a frequent attendee for non-musculoskeletal conditions compared to the control group (single-region consulters) were: 7.07 (95% CI 5.21, 9.58) in recurrent regional pain consulters with persistent widespread pain; 4.99 (95% CI 3.87, 6.43) in recurrent regional pain consulters without persistent widespread pain; and 2.55 (95% CI 1.86, 3.48) in those with persistent widespread pain who were not recurrent regional pain consulters.

Individuals both self-reporting persistent widespread pain and identified as recurrent regional pain consulters were the most severely affected on all self-reported health measures, followed closely by those with persistent widespread pain but not fulfilling the recurrent regional pain consultation definition. Those fulfilling the recurrent regional pain consultant definition but not reporting persistent widespread pain had poorer self-reported health than the control group. For example, the odds of reporting a sleep problem compared to the control group were: 3.07 (95% CI 2.47, 3.81) in recurrent regional pain consulters with persistent widespread pain; 2.97 (95% CI 2.48, 3.54) in those with persistent widespread pain but not recurrent regional pain consulters; and 1.42 (95% CI 1.22, 1.64) in recurrent regional pain consulters without persistent widespread pain.

## Discussion

The first phase of our study determined a prevalence of recurrent regional pain consultation to primary care similar to estimates based on self-reported CWP in the general population.[26] Three-quarters of recurrent regional pain consulters did not have a code recorded for generalized pain conditions related to CWP (e.g. fibromyalgia). They therefore had widespread pain potentially unrecognized as such by their GP.

In the second phase we established some overlap between consultation-based and self-reported widespread pain, with half of all recurrent regional pain consulters over a five-year period self-reporting widespread pain at least once. However, only one-quarter reported persistent widespread pain during this

period. Conversely, only a minority of all those who self-reported CWP (37%) fulfilled the recurrent regional consuler definition during the five-year period.

There were similar patterns of poor health (e.g. more somatic complaints) with recurrent regional pain consultation and self-reported CWP; although this was more marked for consultation measures of poor health in recurrent regional pain consulters, and for survey measures in those with self-reported CWP.

The primary care coding prevalence of fibromyalgia was considerably lower than predicted by community prevalence, even accounting for a proportion of patients not consulting for their symptoms. This is consistent with findings from two large database studies.[10,16] The combined five-year prevalence of recurrent regional pain consultation ('unrecognized' CWP) and non-specific pain complaints ('recognized' CWP), after excluding specific generalized musculoskeletal diagnoses, was slightly higher, at 13%, than general population point prevalence estimates for CWP (10%).[26] Combined with our findings from Phase 2, this indicates that prevalence of widespread pain based on consultation data may give similar prevalence estimates to general population surveys based on strict CWP criteria, but will not represent an identical group of people.

Recurrent regional pain consultation was more common in females and increased with age, consistent with that reported for CWP in the general population.[26] It was associated with more somatic symptoms, self-reported sleep problems and cognitive impairment, and poorer self-reported physical and mental health than observed in those consulting only for single-region problems. These are all features consistent with CWP. Somatic symptoms are a part of the ACR-2010 definition for fibromyalgia, including fatigue and waking unrefreshed.[41] Other research has also shown fibromyalgia and CWP to be associated with poor self-reported mental and physical health.[38,40] Recurrent regional pain consulters were more likely to be frequent attenders, which is consistent with research linking frequent attendance to both CWP[13,21,27] and medically unexplained syndromes.[31,36] However, it may also be a feature of the self-fulfilling nature of a definition that requires repeated consultation, although we excluded musculoskeletal conditions from our definition of frequent attendance.

Half of recurrent regional pain consulters did not self-report widespread pain at either of the two survey points three years apart, and only a third of those self-reporting persistent widespread pain fulfilled the recurrent regional pain consuler definition. Fulfilling recurrent regional pain consultation criteria was associated with worse consultation-based health than self-reporting persistent widespread pain, while persistent widespread pain was associated with worse self-reported health than recurrent regional pain consultation. Rather than identifying all CWP patients who consult their GP, the recurrent regional pain consultation definition identifies a specific group of patients who may be unrecognized as having a generalized condition, and therefore, through their consultation behavior, are expressing a need that may

remain unmet. This group is consequently an important one, since identifying them and managing them appropriately has the potential to improve their health and reduce consultation demands.

The recurrent regional pain consulter definition represents a promising phenotype for EHR studies as it identifies patients with non-local pain who have higher rates of disability and health care use. However, given the disparity between self-reported CWP and recurrent regional pain consultation, it is possible we should consider other approaches to developing a consultation-based definition of CWP, based on two observations. First, only 7% of all those with persistent widespread pain had no record of a musculoskeletal consultation during the study period; musculoskeletal consultation thereby represents a reasonable sampling frame for identifying and managing CWP in the population. Second, single-site musculoskeletal consultation appears to represent a low-severity group (by both consultation and self-report measures). Given this, it may be that systematically seeking information about other pain sites could be a simple way to ensure that GPs consider the extent of pain in their care and management of patients, and may be useful for future development of EHR-based pain phenotypes. The highest severity group – those with combined recurrent regional pain consultation and self-reported CWP – suggests that both sources of information could be useful for care and prevention.

We performed this study in two large samples of patients, using high-quality primary care data and validated self-report instruments. The studies were limited to one area of the UK (North Staffordshire) and the use of an older age group in Phase 2. However, sensitivity analyses using the CiPCA data (not presented) demonstrated minimal differences in number of recorded somatic symptoms and musculoskeletal consultations between recurrent regional pain consulters from all age groups and the subgroup aged 45 plus. Less than a third of the eligible population (i.e. those invited to take part in the baseline study) was included in analyses in Phase 2, and we cannot exclude participation bias. However, we demonstrated that differences between the study sample and non- and partial-responders were small.

Not all patients with a problem will consult their GP for it; consequently, consultation prevalence will be lower than community population prevalence estimates. For chronic conditions, a diagnostic label for a repeatedly-consulted complaint may only be coded at diagnosis.[18] The use of a five-year period to define recurrent regional pain consultation would mean it is less likely we have missed a relevant diagnosis in the Phase 1 study, but it is possible some patients were recorded with fibromyalgia or other diagnosis outside of this period.

We have attempted to define a relatively newly identified phenotype, a group of recurrent pain consulters in primary care, with a prevailing symptom of chronic musculoskeletal pain, who are potentially unrecognized by their GPs as having a generalized condition associated with somatic symptoms. We therefore had no reference standard against which to compare the recurrent regional pain consulters

identified by our algorithm. However, the recurrent regional pain consultation phenotype is closely related to fibromyalgia/CWP, and these conditions have been studied extensively using the ACR-1990 definition. We were able to demonstrate that recurrent regional pain consulters share many characteristics with CWP.

We included 4,482 regional musculoskeletal Read codes in the definition of recurrent regional pain consultation based on previous consensus work. However, the codes may not always indicate musculoskeletal pain (e.g. unstable ankle), and the list includes codes for conditions that may not be appropriate for use in CWP, such as structural derangements (e.g. meniscal tears), infections, and inflammatory arthropathies. There may be other codes with the potential to represent musculoskeletal problems. Evidence of widespread pain and somatic symptoms may also be 'hidden' in the free-text of the consultation.

Our study suggests that recurrent regional pain consulters represent a heterogeneous subgroup of frequent consulters, with chronic musculoskeletal problems as the prevailing symptom of their polysymptomatic distress, who may not be recognized as having a more generalized pain condition associated with somatic symptoms. They include those less severely affected, who do not necessarily fit established and strict CWP criteria, and therefore reflect an overlapping rather than identical group of persons. They nonetheless still exist on the spectrum of polysymptomatic distress characteristic of CWP and fibromyalgia.

The recurrent regional pain consultant algorithm highlights the existence of a substantial group of patients with potentially unmet needs. Treatment focused on regional pain syndromes alone may be sub-optimal if the added burden of pain elsewhere in the body – and the additional characteristics associated with it (such as pain severity and propensity for long-term persistence) – are not identified and taken into account in explanation, advice and care given to the patient.[4,25]

There is some under-recognition of CWP in primary care, implying a need for specific training for GPs. If some patients are not recognized as having generalized pain conditions with associated somatic symptoms, they may be inappropriately managed (as multiple episodes of regional pain). Ineffective management may lead to poor patient outcomes and contribute unnecessarily to primary care workload (continued consultation for unresolved symptoms). Screening for multi-site pain in patients presenting with single-site musculoskeletal complaints may be a simple way for GPs to consider the extent of pain in their management. Future research should explore this clinically important group of chronic consulters. Whilst there appear to be effective treatments for patients with widespread pain, we do not yet understand how best to help those recurrently consulting for regional musculoskeletal pain. Recurrent consultation for local musculoskeletal pain offers a means of identifying a clinically relevant group of high users of primary care. Further research to investigate changes in their health over time, the financial cost of their management,

and possible interventions would offer insights into long-term health outcomes, current economic burden and management of individuals who consult with non-local pain complaints.

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### *Contributions*

KJ had the original idea for the study. All authors were involved in the study design. KM undertook the data management, primary analysis and wrote the first draft. All authors contributed to further drafts and approved the final manuscript. KM had full access to the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

### *Conflict of interest statement*

The authors have no conflicts of interest to declare.

### *Date sharing*

We are unable to share individual-level data.

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## Tables and figures

### Figure legends

**Box 1.** The recurrent regional consuler definition.[33]

<<Insert Box 1 here>>

**Figure 1.** Phase 1: Age and sex distribution for the five-year consultation prevalence of: i) recorded fibromyalgia coding; ii) recorded non-specific generalized pain coding; and iii) recurrent regional pain consultation for all those fully registered with the CiPCA practices **from 2005 to 2009**.

<<Insert Fig. 1 here>>

NB: Y-axis scale varies between Figure i and Figures ii and iii.  
CiPCA: Consultations in Primary Care Archive.

### Table headers

**Table 1.** Phase 1: Five-year prevalence of recorded pain in those **registered in CiPCA practices for the full five-year period from 2005 to 2009 (all ages)**.

**Table 2.** Phase 2: Age, sex, consultation-based health, and self-reported health characteristics by single-region consuler, recurrent regional pain consuler, and self-reported CWP status (ACR-**1990** at baseline and three years), age 50 years and over.

**Table 3.** Phase 2: Overlap of consultation-based pain and self-reported pain status (n, row %, (column %)).

**Table 4.** Phase 2: Results of logistic/linear regression analyses to compare consultation-based and self-reported health characteristics between recurrent regional pain consultation and self-reported persistent widespread pain status.

**Table 1.** Phase 1: Five-year prevalence of recorded pain in those registered in CiPCA practices for the full five-year period from 2005 to 2009 (all ages).

Consultation-based pain definition	n	Five-year recorded prevalence % (95% CI)	
		Crude	Standardized**
Fibromyalgia	290	0.37 (0.33 to 0.42)	0.36 (0.32 to 0.40)
Non-specific generalized pain	6,644	8.10 (7.92 to 8.29)	6.91 (6.73 to 7.08)
Recurrent regional pain consultation	9,172	11.49 (11.27 to 11.72)	9.87 (9.66 to 10.07)
Recurrent regional pain consultation and/or non-specific generalized pain	13,532	16.96 (16.70 to 17.22)	14.61 (14.36 to 14.86)
Recurrent regional pain consultation and/or non-specific generalized pain excluding specific generalized musculoskeletal diagnoses*	12,364	15.49 (15.25 to 15.75)	13.44 (13.19 to 13.68)

\*Excludes any patients recorded with rheumatoid arthritis, systemic lupus erythematosus, polymyalgia rheumatica, ankylosing spondylitis, Sjögren's syndrome, or hypothyroidism.

\*\* Directly standardized to UK general population figures for 2009, source: Office for National Statistics.

CiPCA: Consultations in Primary Care Archive

**Table 2.** Phase 2: Age, sex, consultation-based health, and self-reported health characteristics by single-region consulter, recurrent regional pain consulter, and self-reported CWP status (ACR-1990 at baseline and three years), age 50 years and over.

	Non-mutually exclusive groups		
	Consultation-based pain	Self-reported persistent widespread pain	
	Single-region consulters	Recurrent regional pain consultation	ACR-1990 baseline and 3 years
Number	1,979	1,786	1,190
<b>Mean age (SD)</b>	64 (9)	65 (9)	64 (9)
<b>Female; number (%)</b>	959 (48)	1,084 (61)	758 (64)
<b>Consultation-based health</b>			
Mean somatic symptom count (SD)	1.24 (1.41)	2.66 (2.10)	2.21 (1.99)
One or more recorded somatic symptoms (%)	1,258 (64)	1,567 (88)	963 (81)
Mean non-musculoskeletal consultation count (SD)	27 (20)	44 (27)	39 (25)
Mean musculoskeletal consultation count (SD)	2 (2)	12 (8)	8 (9)
Frequent attenders (non-musculoskeletal consultations); number (%)	101 (5)	405 (23)	209 (18)
<b>Self-reported mental and physical health*</b>			
Mean (SD) SF-12 physical component summary (0 worst health–100 best health) <sup>a</sup>	44.5 (11.7)	36.8 (11.8)	31.7 (10.6)
Mean (SD) anxiety score (0 best health–21 worst health) <sup>b</sup>	6.1 (4.0)	7.5 (4.1)	8.5 (4.4)
Mean (SD) depression score (0 best health–21 worst health) <sup>b</sup>	3.9 (3.3)	5.2 (3.5)	6.4 (3.8)
Mean (SD) cognitive impairment score (0 best health–100 worst health) <sup>c</sup>	10.9 (19.9)	16.1 (22.8)	21.7 (25.8)
Number (%) reporting sleep problems on most nights**	683 (35)	818 (46)	710 (60)

a. 12-item short form health survey – physical component summary [39]: high score = best health (scores are normalized to a general population mean of 50).

b. Hospital Anxiety and Depression Scale[43]: high score = worst health

c. Sickness Impact Profile – Alertness subscale[5]: high score = worst health

\*Data on these variables were incomplete with n ranging from: 1,550 to 1,741 for recurrent regional pain consulters, and 1,056 to 1,178 for persistent widespread pain.

\*\*Percentages calculated based on n equal to participants providing valid responses only.

SD: Standard deviation

CWP: Chronic widespread pain

**Table 3.** Phase 2: Overlap of consultation-based pain and self-reported pain status (n, row %, (column %)).

Self-reported pain	Primary care recorded pain								Total
	No recorded musculoskeletal pain		Single-region musculoskeletal pain		Other musculoskeletal consultations		Recurrent regional pain consulters		
No self-reported pain	532	44.0%	331	27.4%	288	23.8%	59	4.9%	1,210
	(31.8%)		(16.7%)		(10.1%)		(3.3%)		(14.6%)
Pain that is not widespread	873	20.8%	1,116	26.6%	1,429	34.0%	785	18.7%	4,203
	(52.1%)		(56.4%)		(50.2%)		(44.0%)		(50.7%)
Non-persistent widespread pain (baseline <i>or</i> 3 years)	192	11.4%	338	20.1%	656	39.0%	497	29.5%	1,683
	(11.5%)		(17.1%)		(23.0%)		(27.8%)		(20.3%)
Persistent widespread pain (baseline <i>and</i> 3 years)	78	6.6%	194	16.3%	473	39.7%	445	37.4%	1,190
	(4.7%)		(9.8%)		(16.6%)		(24.9%)		(14.4%)
Total	1,675	20.2%	1,979	23.9%	2,846	34.3%	1,786	21.6%	8,286

Row %s are shown in italics next to the n that they are associated with.

Column %s are shown in brackets below the n that they are associated with.

NB: Column %s represent positive predictive values of consultation-based definitions for self-reported pain.

**Table 4.** Phase 2: Results of logistic/linear regression analyses to compare consultation-based and self-reported health characteristics between recurrent regional pain consultation and self-reported persistent widespread pain status.

	Number (%) / Mean (SD)	Effect estimate (95% CI)	Type of effect estimate
<b>Consultation-based</b>			
<b>Frequent attendance<sup>a</sup></b>			
Recurrent regional pain consulter and persistent widespread pain	121 (27%)	7.07 (5.21, 9.58)	odds ratio*
Recurrent regional pain consulter not persistent widespread pain	284 (21%)	4.99 (3.87, 6.43)	odds ratio*
Persistent widespread pain not recurrent regional pain consulter	88 (12%)	2.55 (1.86, 3.48)	odds ratio*
Single-region consulters not persistent self-reported widespread pain (reference)	87 (5%)	reference	odds ratio*
<b>One or more somatic symptoms<sup>b</sup></b>			
Recurrent regional pain consulter and persistent widespread pain	396 (89%)	4.73 (3.45, 6.47)	odds ratio*
Recurrent regional pain consulter not persistent widespread pain	1,171 (87%)	4.03 (3.34, 4.86)	odds ratio*
Persistent widespread pain not recurrent regional pain consulter	567 (76%)	1.89 (1.55, 2.30)	odds ratio*
Single-region consulters not persistent self-reported widespread pain (reference)	1,111 (62%)	reference	odds ratio*
<b>Self-reported</b>			
<b>Reporting of sleep problems on most nights<sup>c</sup></b>			
Recurrent regional pain consulter and persistent widespread pain	269 (60%)	3.07 (2.47, 3.81)	odds ratio*
Recurrent regional pain consulter not persistent widespread pain	549 (41%)	1.42 (1.22, 1.64)	odds ratio*
Persistent widespread pain not recurrent regional pain consulter	441 (59%)	2.97 (2.48, 3.54)	odds ratio*
Single-region consulters not persistent self-reported widespread pain (reference)	573 (32%)	reference	odds ratio*
<b>SF-12 physical component summary<sup>d</sup></b>			
Recurrent regional pain consulter and persistent widespread pain	30.3 (SD 9.5)	-15.53 (-16.72, -14.34)	mean difference**
Recurrent regional pain consulter not persistent widespread pain	39.04 (SD 11.66)	-6.42 (-7.23, -5.61)	mean difference**
Persistent widespread pain not recurrent regional pain consulter	32.62 (SD 11.08)	-13.18 (-14.15, -12.21)	mean difference**
Single-region consulters not persistent self-reported widespread pain (reference)	45.69 (11.07)	reference	mean difference**
<b>HADS anxiety score<sup>e</sup></b>			
Recurrent regional pain consulter and persistent widespread pain	8.8 (SD 4.2)	2.72 (2.30, 3.15)	mean difference**
Recurrent regional pain consulter not persistent widespread pain	7.03 (SD 4.00)	1.07 (0.78, 1.36)	mean difference**
Persistent widespread pain not recurrent regional pain consulter	8.38 (SD 4.44)	2.34 (1.99, 2.69)	mean difference**
Single-region consulters not persistent self-reported widespread pain (reference)	5.87 (SD 3.91)	reference	mean difference**
<b>HADS depression score<sup>e</sup></b>			
Recurrent regional pain consulter and persistent widespread pain	6.6 (SD 3.6)	2.95 (2.60, 3.31)	mean difference**
Recurrent regional pain consulter not persistent widespread pain	4.68 (SD 3.33)	1.00 (0.75, 1.24)	mean difference**
Persistent widespread pain not recurrent regional pain consulter	6.31 (SD 3.96)	2.65 (2.36, 2.94)	mean difference**
Single-region consulters not persistent self-reported widespread pain (reference)	3.69 (SD 3.08)	reference	mean difference**
<b>Cognitive impairment score<sup>f</sup></b>			
Recurrent regional pain consulter and persistent widespread pain	22.6 (SD 26.1)	12.79 (10.45, 15.12)	mean difference**
Recurrent regional pain consulter not persistent widespread pain	13.95 (SD 21.21)	3.99 (2.41, 5.57)	mean difference**
Persistent widespread pain not recurrent regional pain consulter	21.22 (SD 25.61)	11.46 (9.54, 13.38)	mean difference**
Single-region consulters not persistent self-reported widespread pain (reference)	9.87 (SD 19.01)	reference	mean difference**

\* Odds ratio calculated using logistic regression controlling for age and sex, with single-region consulters without persistent self-reported widespread pain as the reference group.

\*\* Mean difference (recurrent regional pain consulter/persistent widespread pain group minus single-region consulter not persistent widespread pain group) calculated using linear regression controlling for age and sex.

a. Frequent attendance model  $\chi^2(5) = 334.96$ ,  $p < 0.001$

b. One or more somatic symptoms model  $\chi^2(5) = 373.65$ ,  $p < 0.001$

c. Reporting of sleep problems on most nights  $\chi^2(5) = 246.72$ ,  $p < 0.001$

d. b. 12-item short form health survey – physical component summary[39]: high score = best health

e. Hospital Anxiety and Depression Scale[43]: high score = worst health

f. Sickness Impact Profile – Alertness subscale[5]: high score = worst health

SD: standard deviation.

CI: confidence interval

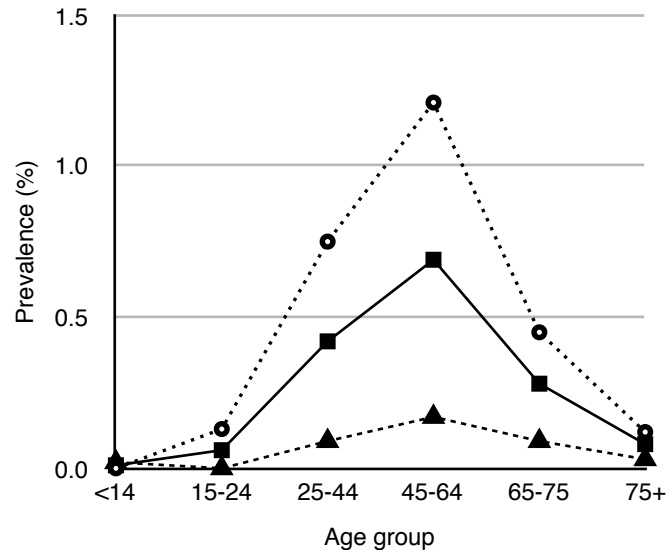
Recurrent regional pain consulter and persistent widespread pain:  $n = 445$

Recurrent regional pain consulter not persistent widespread pain,  $n = 1,341$

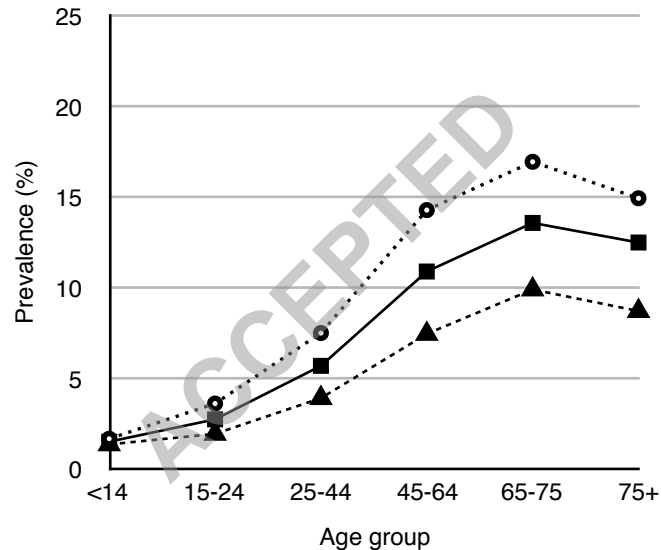
Persistent widespread pain not recurrent regional pain consulter,  $n = 745$

Single-region consulters not persistent widespread pain,  $n = 1,785$

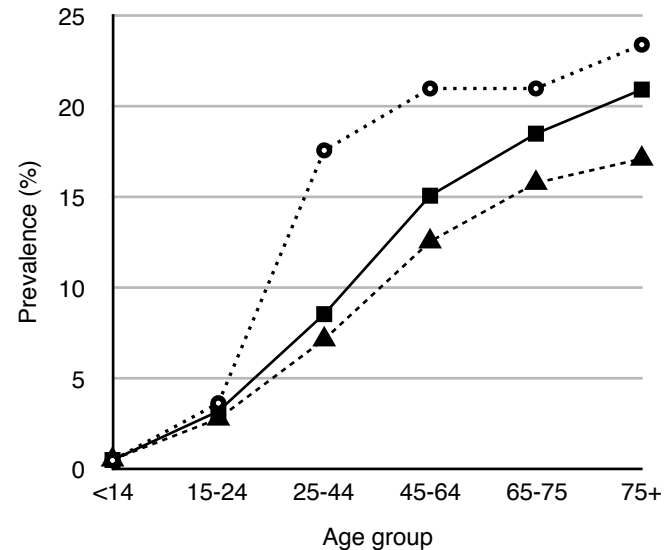
i) Fibromyalgia



ii) Non-specific generalized pain



iii) Recurrent regional pain consultation



○ Female    ▲ Male    ■ Total