

Knee pain and osteoarthritis in the general population: what influences patients to consult?

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Background. We examined the relationship between predisposing factors, enabling factors and need-related factors with consultation for knee pain in general practice.

Methods. This was a retrospective review of computerized medical records for knee-related consultations in the 18 months before baseline assessment of individuals aged over 50 years reporting knee pain in the previous 12 months. The association between each factor and consultation for consulters compared to non-consulters was summarized using odds ratios (ORs). Interaction between each variable and chronic pain grade was investigated. The association between knee-related consultation and the number and type of other co-morbid consultations was then determined.

Results. In total, 742 participants were assessed. Of these, 209 (28%) had a knee-related consultation in the previous 18 months. Recent onset of pain [OR 3.2; 95% confidence interval (95% CI) 1.8, 5.7] and severity of pain, Grade III/IV (OR 3.4; 95% CI 2.1, 5.6), were associated with knee-related consultation. Those rating their knee problem as a health priority were more likely to consult (OR 3.2; 95% CI 1.6, 6.7). Irrespective of knee pain severity, there was no difference in the median number of co-morbid consultations between knee consulters and knee non-consulters.

Conclusions. Need-related factors appeared to be associated with the decision to consult about knee pain. Neither the presence of self-reported selected co-morbid conditions nor the total number of co-morbid conditions was related to consultations for knee pain. Nevertheless, 50% of those with severely disabling knee pain still did not consult for it. Further investigation of this is important in order to optimize care for patients with knee pain and co-morbid disease.

Keywords. Epidemiology, family medicine, pain, rheumatology.

Introduction

Knee pain affects an estimated 25–37% of people over 50 years^{1–4} and is the commonest pain complaint among older adults in general practice.⁵ It is apparent, however, that many people with knee pain do not access formal health care.⁶ A recent population survey conducted in the UK found that of 3023 adults aged 50 years and over reporting knee pain within the previous year, only 33% reported visiting their GP for this during the same period.¹ For those with minor problems who self-manage their condition, this might be appropriate, but delayed treatment for non-consulters with more severe problems might have more far-reaching consequences. Identifying differences between those who do and do not consult is a first step in understanding what determines this decision, what

the barriers and facilitators to this process might be and in generating hypotheses on the possible consequences of non-consultation.

Several theoretical models have been proposed to explain why patients consult their doctor.⁷ One biopsychosocial model was considered by Dieppe *et al.*⁶ in their literature review of why people with symptomatic knee osteoarthritis seek medical help. Factors that influenced consultation were grouped into predisposing, enabling and need-related factors. Predisposing factors included patients' demographic characteristics, health beliefs and social structures. Enabling factors were ease of access to health care, personal or family beliefs and expectations. Need-related factors referred to the individual's functional status and co-morbidity. With respect to knee pain, however, Dieppe *et al.*⁶ found little direct evidence either supporting or

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refuting the role of these factors and concluded that further exploration of these was needed. The findings of a recent prospective study suggest that the severity of knee pain and disability may not be a strong influence on consultation after taking into account other demographic, knee-related and general health characteristics. In addition, certain factors (e.g. depression) may act differently on consultation depending on the level of chronicity or severity of the knee problem.⁸

Our objective was to explore further the relationship between predisposing, enabling and need-related factors on consulting the GP for knee pain in community-dwelling adults aged 50 years and over. Specifically, we sought to include beliefs about the seriousness of osteoarthritis, the effectiveness of health care for this and access to the GP in our model. As the reasons for consulting may be very different for individuals with mild problems compared to those with more severe problems, we investigated whether the effects of predisposing, enabling and need-related factors on consultation were modified by the severity of pain and disability. Finally, we examined whether people with knee-related problems are less likely to consult their GP about their knee if they are consulting for other co-morbid conditions. We considered both the number and type of co-morbid consultations.

Methods

Study design and population

The Clinical Assessment Study (Knee) [CAS(K)] is a population-based prospective observational cohort study of knee pain and knee osteoarthritis. Older adults experiencing knee pain in the past 12 months were identified from a two-stage postal survey (comprising a Health Survey questionnaire followed by a Regional Pain Survey questionnaire) of all adults aged 50 years and over registered with three general (family) practices in North Staffordshire.⁹ More than 95% of the UK population are registered with general practices irrespective of their actual use of health care, and practice registers offer a convenient sampling frame for surveys of a local population and offer the added potential for linkage between survey data and practice-held medical records. Respondents who provided written consent to further contact were invited to attend a research clinic for more detailed assessment, which included clinical interview and examination and a short self-complete questionnaire. Participants were also asked for permission to link their research clinic data with records of their general practice consultations. The study protocol was approved by North Staffordshire Local Research Ethics Committee and has been published along with the full content of the questionnaires and clinical assessment.^{9,10}

Factors that might influence consultation were selected from information gathered in the Health Survey questionnaire, the Regional Pain Survey questionnaire, the short self-complete questionnaire completed at the clinic and the clinical interview.

Predisposing factors. The Health Survey questionnaire included information on age (analysed as 50–64 years compared to 65+ years), gender, educational attainment (school-age education/further education), occupational class based on current or last job title,^{11,12} perceived adequacy of income,¹³ marital status (married, cohabiting compared to divorced, separated, widowed and single), number of close friends¹⁴ and presence of a confidante.¹⁵

Enabling factors. Respondents were asked in the Health Survey questionnaire about their general perceptions on the seriousness of osteoarthritis as a condition, how much doctors can do about pain and joint problems and whether they felt they had good access to their GP.

Need-related factors. Knee pain severity and associated disability were classified using the chronic pain grade¹⁶ that was gathered from the short self-complete questionnaire at the clinic. This consists of seven items and classifies individuals into four hierarchical categories (Grade I, Low disability–low intensity; Grade II, Low disability–high intensity; Grade III, High disability–moderately limiting; Grade IV, High disability–severely limiting). Pain persistence was measured by a single item on the cumulative number of days in the prior 6 months that their knee pain had been present (1–30 days, 31–89 days, 90+ days).¹⁶ Time since onset of knee problem was ascertained by clinical interview. Participants were also asked at interview to rate their two most important health problems at the moment. Those naming their knee problem—or a generalized musculoskeletal problem such as ‘arthritis’ in which respondents incorporated the knee—were counted as ‘knee related’. Those nominating different health problems were classed as ‘non-knee related’. The remainder who reported no important health problems at the time of interview were classed as ‘none’. General health status (SF-12 Physical and Mental Health Components),¹⁷ levels of anxiety and depression (Hospital Anxiety and Depression scales)¹⁸ and the self-reported presence of selected co-morbidities (heart problems, chest problems, raised blood pressure, diabetes—yes/no) were gathered from the Health Survey questionnaire.

A review of consultation data held on the general practice computer system was undertaken for the 18-month period prior to clinic attendance for all consenting participants. Doctors at the practices routinely

code and enter details of all patient consultations on computer. Individual problems are coded separately during each consultation. Removing coded consultations for the knee problems therefore does not lead to a loss of co-morbid consultations. The participating practices are members of the Keele GP Research Partnership and the completeness of their coding of consultations is subject to annual quality review. The consultation data review was comprised of two parts.

First, all consultations related to the knee were identified through a search of the Read code and free-text entries (full details of the search strategy are available from the authors). Participants were classed as knee consulters or knee non-consulters on the basis of having at least one knee-related consultation in the same 18-month period (full details of the search terms for knee consultations are available from the authors). The free-text entries were independently assessed by two of the authors (JB, GP). Disagreements were resolved by consensus between the two raters.

Second, all Read-coded consultations were identified by their Read code¹⁹ chapter. Consultations previously identified as being knee related were excluded from this analysis. Chapters where there were few consultations (less than 100 before the removal of knee consultations) were excluded from these analyses. Consultations in chapters L (complications due to pregnancy), P (congenital anomalies) and Q (perinatal conditions) were excluded as they were not relevant to our study group and were assumed to be anomalous. In addition, to ensure the comprehensive inclusion of all potential consultations for medical conditions, numbered Read code chapters 1 (history and symptoms), 6 (preventative procedures), 7 (operations, procedures, sites) and 8 (therapeutic processes) were included.

Statistical analysis

Step 1: Association between self-reported predisposing, enabling and need-related factors and knee-related consultation. The relationship between each predisposing, enabling and need-related factor and consultation was described for the sample as a whole. The strength of univariable association was assessed using logistic regression and expressed as odds ratios (ORs) with 95% confidence intervals (95% CIs). Variables that were significantly associated with consultation ($P < 0.05$) in this univariable analysis were then adjusted for age and gender. Finally, these factors were entered into a multivariable logistic regression model to test their independent contribution to consultation. To determine if these associations were modified by the severity of knee pain, interactions were fitted between each variable and chronic pain grade (Grade I, II and III/IV).

Step 2: Association between total number and type of co-morbid consultation and knee-related consultation. The total number of co-morbid consultations per person in the previous 18 months was categorized (0, 1–2, 3–5, 6–8, 9–17, 18 or more) and used as the independent variable in an unadjusted logistic regression analysis. This categorization was chosen because 18 or more consultations represent at least one consultation per month, etc. The reference category for this analysis was set at three to five consultations in the 18-month period, as this is the ‘average’ number of consultation that would be expected in this time period.^{20,21} As in the previous analyses, these crude ratios were then adjusted for age and gender. Finally, adjustment was made for the predisposing, enabling and need-related factors previously found to be significant in step 1.

The analyses were then repeated taking the number of co-morbid consultations within each Read code chapter (categorized 0, 1–3, 4 or more) as the independent variable.

Lastly, to assess whether differences between knee consulters and knee non-consulters in the number of co-morbid consultations were related to the severity of knee pain, the median number of consultations per person was considered, stratified by chronic pain grade.

All analyses were carried out using Stata Statistical Software: Release 9.

Results

A total of 3106 (28.9%) patients aged over 50 in the study practices were identified as suffering with knee pain in the previous 12 months. Of this group, 1949 participants responded to the regional pain survey and were invited for clinical assessment. Of these responders, 819 (42.2%) attended the research clinic. Patients who did not attend the clinic were more likely to be aged over 80, from lower socio-economic groups, employed, experiencing anxiety or depression or reported only a brief episode of knee pain in the previous year. Of the people attending the research clinic, 38 had a chronic pain grade of zero or had not suffered pain in the past 6 months and so were excluded. A further 39 people did not consent to a review of their medical records and so were also excluded. This left 742 of the original 819 patients who attended a clinical assessment.

Within this group, a knee-related consultation with their GP was identified for 209 (28.2%) during the previous 18 months. Of these, 29 were identified from free-text entries and the remainder using consultation Read code.

Table 1 shows the frequency of each predisposing, enabling and need-related factors in the study sample

TABLE 1 *Distribution of predisposing, enabling and need-related factors for total sample and stratified by knee consultation status*

	Total (n = 742)	Consulted (n = 209)	Not consulted (n = 533)
Predisposing factors			
Age (years), mean (SD)	65.5 (8.6)	66.8 (9.0)	65.0 (8.4)
Female gender	398 (54)	115 (55)	283 (53)
School-age education	620 (85)	183 (90)	437 (83)
Marital status			
Married	532 (73)	383 (73)	149 (72)
Cohabiting	15 (2)	12 (2)	3 (1)
Divorced	33 (5)	23 (4)	10 (5)
Separated	5 (1)	3 (1)	2 (1)
Single	24 (3)	18 (3)	6 (3)
Widowed	123 (17)	87 (17)	36 (17)
Manual occupation ^a	375 (57)	108 (59)	267 (57)
Perceived adequacy of income			
Find it a strain	33 (5)	10 (5)	23 (4)
Have to be careful	294 (40)	79 (39)	215 (41)
Able to manage	273 (38)	80 (39)	193 (37)
Quite comfortably off	128 (18)	35 (17)	93 (18)
Six or more close friends	293 (40)	90 (44)	203 (39)
Has confidante	663 (92)	185 (91)	478 (92)
Enabling factors			
Osteoarthritis is a serious condition			
Strongly disagree	4 (1)	1 (0)	3 (1)
Disagree	7 (1)	2 (1)	5 (1)
Neither agree nor disagree	36 (5)	12 (6)	24 (5)
Agree	402 (55)	107 (52)	295 (57)
Strongly agree	278 (38)	83 (40)	195 (37)
Doctors can do a lot to help people with joint problems			
Strongly disagree	8 (1)	2 (1)	6 (1)
Disagree	66 (9)	16 (8)	50 (10)
Neither agree nor disagree	157 (21)	35 (17)	122 (23)
Agree	437 (60)	133 (64)	304 (58)
Strong agree	64 (9)	21 (10)	43 (8)
I do not expect doctors to be able to do much about pain			
Strongly disagree	41 (6)	14 (7)	27 (5)
Disagree	379 (52)	107 (52)	272 (52)
Neither agree nor disagree	173 (24)	44 (21)	129 (25)
Agree	125 (17)	40 (19)	85 (16)
Strong agree	13 (2)	2 (1)	11 (2)
Has good access to own doctor	673 (93)	193 (95)	480 (92)
Need-related factors			
Time since onset of knee problem			
<1 year	92 (12)	37 (18)	55 (10)
1–5 years	256 (35)	74 (35)	182 (34)
5–10 years	147 (20)	37 (18)	110 (21)
10+ years	247 (33)	61 (29)	186 (35)
Persistent knee pain ^b	211 (28)	87 (42)	124 (23)
Chronic pain grade			
Grade I	400 (54)	74 (35)	326 (61)
Grade II	182 (25)	57 (27)	125 (23)
Grade III	80 (11)	38 (18)	42 (8)
Grade IV	80 (11)	40 (19)	40 (8)
SF-12 (0–100), Mean (SD)			
Physical component score	37.4 (11.9)	34.4 (10.9)	38.6 (12.1)
Mental component score	50.6 (11.0)	51.1 (11.2)	50.4 (10.9)
Self-reported co-morbidity			
Chest problems	150 (20)	46 (22)	104 (20)
Heart problems	150 (20)	45 (22)	105 (20)
Raised blood pressure	305 (41)	88 (42)	217 (41)
Diabetes	79 (11)	24 (11)	55 (10)
Number of self-reported co-morbidities			
None	286 (39)	76 (36)	210 (39)
1	288 (39)	81 (39)	207 (39)
2+	168 (23)	52 (25)	116 (22)
HAD anxiety (0–21), Mean (SD)	6.6 (4.1)	6.6 (4.2)	6.6 (4.1)
HAD depression (0–21), Mean (SD)	4.6 (3.4)	5.0 (3.2)	4.5 (3.4)

TABLE 1 *Continued*

	Total (<i>n</i> = 742)	Consulted (<i>n</i> = 209)	Not consulted (<i>n</i> = 533)
Most important health problems at the moment			
None	96 (13)	11 (5)	85 (16)
Non-knee related	296 (40)	63 (30)	233 (44)
Knee related	350 (47)	135 (65)	215 (40)

Numbers are *n* (%) unless otherwise stated.

^aDefined from current/last job title.

^bDefined as knee pain present on at least 90 days in the last 6 months.

as a whole and separately for those who had and had not consulted about their knee in the previous 18 months. Of the 742 participants, the mean age was 65.5 years (SD 8.6). In all, 398 (54%) were female. The majority had their most recent job in a manual occupation (57%) and, although their knee problems had often begun five or more years before (53%), knee pain was typically reported as intermittent (72%) and mild (Grade I = 54%). There appeared to be few obvious differences between those who had a recorded knee consultation in the previous 18 months and those who had not. Possible exceptions were knee pain severity and self-rated importance of the knee problem. Thirty-seven per cent of consulters had severe knee pain (Grades III and IV), while only 16% of non-consulters had pain of this severity. Knee consulters more frequently rated their knee problem as the most important health problem at the moment (65%) compared with non-consulters (40%).

Table 2 gives the unadjusted, age- and gender-adjusted and fully adjusted ORs for the association between each of the predisposing, enabling and need-related factors and knee-related consultation in the sample as a whole. The presence of a confidante and reporting good access to the GP were not included in the analysis due to the very high frequency of both. Crude and age/gender-adjusted ORs were very similar and so we refer only to the latter in the text of this section. Results of tests for interactions in the unadjusted model between each factor and chronic pain grade were non-significant.

Gender, educational attainment and time of onset for pain more than 1 year demonstrated no association with consultation for knee pain. Older age (OR 1.5; 95% CI 1.1, 2.1), more recent onset of knee problem (<1 year OR 2.1; 95% CI 1.2, 3.5) and more persistent knee pain (OR 2.1; 95% CI 1.2, 3.5) were all associated with having consulted the GP about their knee problem. Individuals who felt their knee pain was one of the two most important health problems for them at the time of assessment were much more likely to have consulted compared to those who felt they had no important health problems (OR 4.9; 95% CI 2.5, 9.6). However, having other morbidity as the health priority did not significantly increase the odds of

consultation for a knee disorder having adjusted for other factors (OR 2.1; 95% CI 1.0, 4.1).

When adjusting for these factors in the multivariable logistic regression model, only time of pain onset less than 1 year (OR 3.2; 95% CI 1.8, 5.7), knee pain as the most important health issue (OR 3.2; 95% CI 1.6, 6.7) and severe pain Grade III/IV (OR 3.4; 95% CI 2.1, 5.6) remained significantly associated with knee consultation.

Knee consulters made a total of 961 co-morbid consultations [median number of consultations per person: 9; inter-quartile range (IQR): 4, 15], and knee non-consulters a total of 2111 co-morbid consultations (median: 11; IQR: 6, 16).

There was no evidence that a higher number of co-morbid consultations was associated with consulting about a knee problem (Table 3).

Table 4 examines the relationship between Read-coded co-morbid consultations by chapter and knee-related consultation. The adjusted analysis indicates that there were no significant relationships other than for other musculoskeletal conditions. Patients with four or more consultations for these conditions in the previous 18 months (which do not include knee-related Read codes) were twice as likely to have a knee-related consultation compared with those who had no consultations for these conditions (OR 2.0; 95% CI 1.1, 3.5).

In addition to being associated with knee consultation, the severity of knee pain was associated with the number of co-morbid consultations (Table 5). People with severe (Grade IV) knee pain had more co-morbid consultations than did those with less severe (Grade I) knee pain (median number of co-morbid consultations 16 versus 8). Overall, within each pain grade, there was no difference in the median number of co-morbid consultations between knee consulters and knee non-consulters.

Discussion

In keeping with many community symptoms, our findings confirm that only a minority of adults aged 50 years and over reporting current or recent knee pain consult their GP.

TABLE 2 Association between selected factors and knee-related consultation

	Total (n = 742 ^a)	Consulted (n = 209 ^a)	OR (95% CI) ^b	OR (95% CI) ^c	OR (95% CI) ^d
Age (years)					
50–64	343	81	1	1	1
65+	384	122	1.5 (1.1, 2.1)	1.5 (1.1, 2.1)	1.4 (1.0, 2.1)
Gender					
Male	334	90	1	1	1
Female	392	113	1.1 (0.8, 1.5)	1.1 (0.8, 1.5)	0.9 (0.6, 1.3)
Educational attainment					
Further education	107	20	1	1	1
School-age education	620	183	1.8 (1.1, 3.1)	1.7 (1.0, 2.9)	1.6 (0.9, 2.8)
Marital status					
Married/cohabiting	547	152	1	–	–
Divorced/separated/widowed/single	185	54	1.1 (0.7, 1.5)	–	–
Occupation					
Non-manual	279	75	1	–	–
Manual	375	108	1.1 (0.8, 1.6)	–	–
Perceived adequacy of income					
Find it a strain/have to be careful	327	89	1	–	–
Able to manage/quite comfortably off	401	115	1.1 (0.8, 1.5)	–	–
Number of close friends					
<6	439	115	1	–	–
Six or more	293	90	1.2 (0.9, 1.7)	–	–
Osteoarthritis is a serious condition					
Strongly disagree/disagree/neither	47	15	1	–	–
Agree/strongly agree	680	190	0.9 (0.7, 1.2)	–	–
Doctors can do a lot to help people with joint problems					
Strongly disagree/disagree	74	18	1	–	–
Neither	157	35	0.9 (0.5, 1.7)	–	–
Agree/strongly agree	501	154	1.4 (0.8, 2.4)	–	–
I do not expect doctors to be able to do much about pain					
Strongly disagree/disagree/neither	231	53	1	–	–
Agree/strongly agree	501	154	1.0 (0.8, 1.2)	–	–
Time since onset of knee problem					
10+ years	244	37	1	1	1
5–10 years	141	74	1.0 (0.6, 1.6)	1.0 (0.6, 1.7)	1.0 (0.6, 1.6)
1–5 years	251	37	1.2 (0.8, 1.8)	1.3 (0.9, 1.9)	1.6 (1.0, 2.5)
<1 year	91	61	2.1 (1.2, 3.4)	2.1 (1.2, 3.5)	3.2 (1.8, 5.7)
Knee pain persistence					
Non-persistent	521	122	1	1	1
Persistent	206	87	2.4 (1.7, 3.3)	2.3 (1.6, 2.3)	1.3 (0.8, 1.9)
Chronic pain grade					
I	400	74	1	1	1
II	182	57	2.0 (1.3, 3.0)	2.0 (1.3, 3.0)	1.7 (1.1, 2.7)
III/IV	160	78	4.2 (2.8, 6.2)	4.1 (2.7, 6.1)	3.4 (2.1, 5.6)
Self-reported chest problems					
No	592	163	–	–	–
Yes	150	46	1.2 (0.8, 1.7)	–	–
Self-reported heart problems					
No	592	164	1	–	–
Yes	150	45	1.1 (0.8, 1.7)	–	–
Self-reported raised blood pressure					
No	437	121	1	–	–
Yes	305	88	1.1 (0.8, 1.5)	–	–
Self-reported diabetes					
No	663	185	1	–	–
Yes	79	24	1.1 (0.7, 1.9)	–	–
Number of self-reported co-morbidities					
None	286	76	1	–	–
1	288	81	1.1 (0.7, 1.6)	–	–
2+	168	52	1.2 (0.8, 1.9)	–	–
HAD anxiety					
Yes ^e	284	82	1	–	–
No	458	127	0.9 (0.7, 1.3)	–	–
HAD depression					
Yes ^e	146	49	1	–	–
No	596	160	0.7 (0.5, 1.1)	–	–

TABLE 2 *Continued*

	Total (<i>n</i> = 742 ^a)	Consulted (<i>n</i> = 209 ^a)	OR (95% CI) ^b	OR (95% CI) ^c	OR (95% CI) ^d
Most important health problems at moment					
None	96	11	1	1	1
Non-knee related	296	63	2.1 (1.1, 4.2)	2.1 (1.0, 4.1)	1.5 (0.7, 3.2)
Knee related	350	135	4.9 (2.5, 9.4)	4.9 (2.5, 9.6)	3.2 (1.6, 6.7)

Cells with dashes represent variables not included in the model.

^aNumbers may not sum to total due to missing data.

^bCrude ORs.

^cAge- and gender-adjusted ORs.

^dORs adjusted for all other variables in model.

^eDefined as a score on the HADS anxiety or depression scale ≥ 8 .

TABLE 3 *Association between total number of co-morbid consultations and knee-related consultation*

	<i>n</i>	<i>n</i> (%) with knee-related consultation	OR ^a	OR ^b	OR ^c
Total number of co-morbid consultations					
0	39	6 (15)	0.5 (0.2, 1.4)	0.6 (0.2, 1.5)	0.5 (0.2, 1.4)
1–2	56	9 (16)	0.6 (0.2, 1.2)	0.6 (0.3, 1.3)	0.7 (0.3, 1.6)
3–5	123	32 (26)	1	1	1
6–8	129	40 (31)	1.3 (0.7, 2.2)	1.2 (0.7, 2.2)	1.1 (0.6, 2.0)
9–17	256	73 (29)	1.1 (0.7, 1.8)	1.1 (0.7, 1.8)	1.0 (0.6, 1.7)
18+	139	49 (35)	1.6 (0.9, 2.6)	1.5 (0.9, 2.6)	1.1 (0.6, 1.9)

^aCrude ORs.

^bAge- and gender-adjusted ORs.

^cORs adjusted for all other variables in model.

In many respects, non-consulters appear little different from consulters. In our study, there were no differences between the two in gender, occupational class, marital status, social network structure, general beliefs about joint pain and osteoarthritis or how effective they perceive doctors to be for these problems. Admittedly, these factors were measured in relatively broad terms. A more detailed account of decision making nearer the time of consultation (e.g. using a case–crossover design)^{22,23} would shed more light on the actual mechanisms influencing consultation. Our objective, however, was to describe differences in the people who consult and those who do not. Identifying broad differences is still useful for generating hypotheses and targeting future research.

The factors most strongly related to consultation in our study were need related. Knee pain was more likely to be associated with going to see the GP if it was more severe, interfered with daily activities and was perceived as a recent development. These findings make sense and are relatively straightforward.

In addition, one key issue that emerged from our study was the role of patient prioritizing. Co-morbidity was common with over 60% of participants reporting one or more predefined co-morbid conditions. In keeping with other studies, hypertension, diabetes

and cardiovascular disease frequently co-occurred with knee-related and musculoskeletal conditions.^{24,25} Since co-morbidity is commonly associated with knee problems and other musculoskeletal conditions, all of which can result in marked disability, there may be the potential for undertreating knee disorders because of other health care priorities potentially leading to non-consultation for knee-related problems. The evidence from this study for co-morbidity pushing knee problems ‘off the consultation agenda’ is mixed.

Neither the presence of self-reported selected co-morbid conditions nor the total number of co-morbid consultations was associated with non-consultation for the knee problem. In fact, a higher number of consultations for other musculoskeletal problems was associated with a higher probability of consulting about the knee. This most likely reflects the fact that knee pain is frequently accompanied by pain at other sites,²⁶ they may be inseparable or difficult to distinguish and a consultation for shoulder pain, for example, may include an assessment by the GP of pain in other joints. However, a remaining limitation of both the self-reported and the consultation data on co-morbid conditions is the absence of any measure of the severity or urgency of these.

TABLE 4 Relationship between number of co-morbid consultations within each Read code chapter and knee-related consultation

Chapter	Chapter title	Range of number of co-morbid consultations	Number of co-morbid consultations	Total <i>n</i>	Knee-related consultation <i>n</i> (%)	OR (95% CI) ^a
1	History/symptoms	0–15	0	511	133 (26)	1
			1–3	201	65 (32)	1.4 (0.9, 1.9)
			4+	30	11 (36)	1.7 (0.6, 3.7)
6	Preventative procedures	0–22	0	428	113 (26)	1
			1–3	290	87 (30)	0.9 (0.6, 1.3)
			4+	24	9 (38)	1.8 (0.7, 4.6)
7	Operations, procedures, sites	0–15	0	631	183 (29)	1
			1–3	101	24 (24)	0.7 (0.4, 1.2)
			4+	10	2 (20)	0.6 (0.1, 2.8)
8	Therapeutic processes	0–37	0	582	155 (27)	1
			1–3	141	49 (35)	1.2 (0.8, 1.9)
			4+	19	5 (26)	0.9 (0.3, 2.8)
A	Infectious and parasitic diseases	0–6	0	673	186 (28)	1
			1–3	66	22 (33)	1.3 (0.7, 2.4)
			4+	3	1 (33)	0.3 (0.1, 18.2)
C	Endocrine, nutritional, metabolic and immunity disorders	0–20	0	609	169 (28)	1
			1–3	87	24 (28)	0.9 (0.5, 1.6)
			4+	46	16 (35)	0.9 (0.5, 1.9)
E	Mental disorders	0–15	0	576	172 (30)	1
			1–3	128	25 (20)	0.6 (0.4, 1.0)
			4+	38	12 (32)	1.0 (0.5, 2.4)
F	Nervous system and sense organs	0–9	0	582	160 (27)	1
			1–3	144	48 (33)	0.3 (0.08, 1.9)
			4+	16	1 (6)	0.2 (0.0, 1.7)
G	Circulatory system diseases	0–49	0	409	104 (25)	1
			1–3	176	53 (30)	1.0 (0.6, 1.6)
			4+	157	52 (33)	1.3 (0.8, 2.0)
H	Respiratory system diseases	0–31	0	486	126 (26)	1
			1–3	196	65 (33)	0.4 (0.9, 2.0)
			4+	60	18 (30)	1.0 (0.6, 2.0)
J	Digestive system diseases	0–11	0	615	169 (27)	1
			1–3	112	35 (31)	1.2 (0.7, 1.9)
			4+	15	5 (30)	0.8 (0.2, 2.7)
K	Genito-urinary system diseases	0–12	0	635	174 (27)	1
			1–3	89	27 (30)	1.0 (0.6, 1.7)
			4+	18	8 (44)	1.9 (0.7, 5.3)
M	Skin and subcutaneous tissue disease	0–15	0	594	154 (26)	1
			1–3	130	48 (37)	1.5 (1.0, 2.4)
			4+	18	7 (39)	1.7 (0.6, 4.8)
N	Musculoskeletal and connective tissue diseases	0–19	0	454	104 (23)	1
			1–3	215	71 (33)	1.5 (1.0, 2.2)
			4+	73	34 (47)	2.0 (1.1, 3.5)
R	[D] Symptoms, signs and ill-defined conditions	0–14	0	411	115 (28)	1
			1–3	243	70 (29)	1.1 (0.8, 1.6)
			4+	88	24 (27)	0.8 (0.4, 1.4)
S	Injury and poisoning	0–8	0	689	191 (28)	1
			1–3	48	17 (35)	1.5 (0.8, 2.9)
			4+	5	1 (20)	0.7 (0.1, 6.7)
Z	Unspecified conditions	0–5	0	657	184 (28)	1
			1–3	84	25 (30)	1.2 (0.7, 2.0)
			4+	1	0 (0)	–

Cell with dash represents ORs inestimable due to zero cell count.

^aORs adjusted for age, chronic pain grade, sex, educational attainment, onset, persistence and priority.

When participants were asked directly what their most important health problems currently were, those identifying their knee pain as a health priority were more likely to have consulted about their knee than those who named other co-morbid illness as their priority (unadjusted difference in proportion consulting 17.2%; 95% CI 10.1, 23.9). This provides modest

evidence in favour of the idea that co-morbid illness, when recognized as important, may result in non-consultation for knee problems. However, these are tentative findings that require further research.

Regardless of this, we are still left with the observation that many older adults with severe knee pain do not appear to have consulted their doctor about it in

TABLE 5 Number of non-knee consultations in each chronic pain group, by knee consultation or not

Median (IQR)	Knee consulter	Knee non-consulter
Chronic pain grade		
I	8 (4.75, 15)	8 (4, 13)
II	8 (4, 14)	8 (5, 14)
III	11 (7, 17)	12.5 (7, 19.25)
IV	16 (10.25, 25.75)	16 (8.25, 22)

the recent past. Out of 160 individuals with severely disabling knee pain (Grade III or IV), only 78 (49%) had evidence of a consultation about this with their GP in the previous 18 months. Given this level of pain and associated disability, what are the differences between consulters and non-consulters? Comparisons are difficult to interpret in the current study due to small numbers. However, just as for the sample as a whole, recent onset seems to increase the chance of consulting.

These are not individuals who steadfastly avoid going to see their doctor. They attend the surgery on an average of 16 occasions over an 18-month period. In addition, a sizeable minority (39%) of those who do not consult about their knee may still regard it as one of their most important health problems. Perhaps for these patients when consulting about conditions other than musculoskeletal problems, they consider it 'important, but not that important'. So does it matter that their knee is not one of the things discussed? This process and its consequences deserve further attention.

This is a significant issue for general practice since early intervention in knee pain, such as advice regarding weight loss, knee exercises, physiotherapy and simple analgesia, may improve the long-term prognosis for these patients.²⁷⁻³⁰ Managing knee pain and managing co-morbid illness may not simply be an either-or choice. Managing co-morbid illness may confer 'collateral' benefits by reducing a cause of disability that works in synergy with knee.^{31,32} Some interventions initiated in response to co-morbid illness, for example encouraging weight loss or physical activity, are also recommended for knee pain and osteoarthritis.^{27,28} Against this is the growing recognition that, while it may not be fatal, lower limb joint pain may be a critical factor behind disability in older adults³³ and a range of adverse health consequences such as depression, deconditioning and social isolation.³⁴ It may even limit the effectiveness of treatment for the co-morbid illness. Therapies used to improve knee pain and disability improve a patient's mobility and exercise tolerance,²⁷⁻³⁰ thereby inevitably benefiting other co-morbidities such as cardiovascular and respiratory disease.^{35,36} The general underassessment and undertreatment of pain in later life³⁷ would suggest that

a more proactive approach is needed. Our study suggests that there may be multiple occasions in general practice at which to opportunistically assess and potentially manage pain in those older adults who do not appear to consult for their knee problem. Further prospective studies are needed to investigate the consequences of non-consultation for joint pain and osteoarthritis in older adults and the relationship with co-morbid illness consultations and management. However, the opportunity that co-morbid consultations provide for improving osteoarthritis care is an avenue for future research.

In relation to generalized musculoskeletal problems, studies have demonstrated that in keeping with our work, certain socio-demographic factors such as advanced age and lower educational achievement appear to be associated with increased frequency of consultations.^{38,39} Ease of access to health care has been found to play a part in consultation behaviour, while this was not evident in our study.⁴⁰ In addition, mental health problems have previously been noted to be associated with consultation for chronic widespread pain,⁴¹ while one study specifically about the knee found that depression reduced the likelihood of knee consultation.⁸ In our study, mental health did not appear to be related to consultations for knee disorders whatever the pain grade. Differences may be attributable to the varying questionnaires used to assess mental health. As with other studies, we found that higher levels of pain and disability were more likely to be associated with health care usage.^{42,43} With respect to knee pain specifically, however, Jordan *et al.*⁸ found no association of knee pain severity with consultation. This may be due to the fact that in their study, knee pain was assessed using a dichotomous measure from the WOMAC,⁴⁴ rather than using stratified levels of pain as we did in this study. This might therefore overlook the effect of pain severity that we demonstrated in this study at higher levels. Waxman *et al.*⁴² similarly found that recent onset of pain was associated with consultation but this was in relation to low back pain rather than knee pain. In keeping with Jordan *et al.*,⁸ our study found that chronic or persistent pain was more likely to be associated with consultation (OR 1.28), but this was not a significant finding when adjusting for all other factors.

Since the oldest old were less likely to be represented in our sample, as well as those from lower socio-economic groups and those in employment, we cannot assume that the results reflect the population in general. It is unlikely that any single factor could explain selective non-participation in the CAS(K) cohort: several may be operating at once (e.g. inconvenience of attending research clinics during working hours for younger, healthier people, reluctance of frail, severely limited older people to come to clinic). In spite of probable self-selection bias, participants

were recruited from across the full spectrum (e.g. from very mild to very severe pain, from 50 to 93 years) and our estimate of 28% with a recorded consultation in the preceding 18 months is broadly consistent with a similar study in which 33% self-reported consulting their GP in the previous year.¹ Nevertheless, our findings on the factors associated with consultation may be affected by selective non-participation. Our list of predisposing, enabling and need-related factors was not exhaustive. Other factors, not included in our analysis that may have had more influence, include details such as previous health care usage, exposure to the media, feelings of personal risk, advice and information from other health care professionals or alternative/complementary therapies. One final limitation of the study is that some of the positive results we found may have occurred due to chance since multiple tests of association were employed.

In conclusion, patients with knee pain are commonly found to have co-morbid conditions but overall, apart from musculoskeletal conditions, there appears to be no association of these with knee-related consultation. The severity and onset of the knee pain positively influence the consultation rate for knee pain itself as does the perception that their knee problem is an important current health issue. However, despite this, 50% of patients with severe knee pain still do not consult their GP regarding it for some reason, even though they frequently consult the GP about other problems. Further investigation of this interaction will allow GPs to optimize their delivery of care in the consultation.

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