

Epidemiology of hip and knee pain and its impact on overall health status in older adults

J. Dawson¹, L. Linsell², K. Zondervan³, P. Rose², T. Randall², A. Carr⁴
and R. Fitzpatrick²

Objectives. To obtain prevalence rates of hip and knee pain in elderly people and compare combinations of symptoms with overall health status.

Methods. We performed a cross-sectional postal survey of a random sample of 5500 Oxfordshire residents aged 65 yr and older. Prevalence estimates were based on the screening question: 'During the past 12 months, have you had pain in or around either of your hip/knee joints on most days for one month or longer?' Overall health status was assessed with the SF-36 questionnaire.

Results. The response rate was 66.3% (3341/5039 eligible people), and was highest (~72%) for the 65–74 yr age-group. The percentage reporting hip pain was 19.2% [95% confidence interval (CI) 17.9–20.6], and 32.6% (95% CI 31.0–34.3) reported knee pain. The percentage reporting hip and knee pain was 11.3%, and 40.7% reported hip or knee pain. Less than half (48%) of the symptomatic respondents had unilateral problems affecting one hip or knee joint only. SF-36 scores worsened as the number of symptomatic hip and knee joints increased ($P < 0.001$ for physical function, physical role limitation and bodily pain).

Conclusions. Patterns of hip and knee symptoms are complex in older people. Amongst the symptomatic, most have more than one hip/knee affected. This has implications for treatment and health status measurement. In the absence of hip and knee symptoms, general health status scores of elderly people are similar to those of people aged under 65 yr.

KEY WORDS: Hip, Knee, Health status.

Symptomatic hips or knees cause considerable disability and social isolation in the elderly [1]. In older people, persistent hip or knee pain is generally due to osteoarthritis (OA), a diagnosis that is frequently made solely on clinical grounds due to the lack of agreement between the presence of radiographic signs of OA and symptoms [2].

A number of population-based studies have reported the prevalence of people affected by hip or knee pain, or by hip or knee OA specifically [3–9]. Such studies vary with regard to the age profile of their study samples and most impose lower—and occasionally upper—age limits. All nevertheless agree that the prevalence of hip or knee disease is highest amongst those who are over 65 yr of age.

While published work on population-based studies has tended to concentrate on either the hip or the knee, rarely are both considered together in any detail. Some attention has been given to this matter in studies of people attending hospital outpatients departments (e.g. the Bristol OA500 study [10]), where the study population is more highly selected, representing patients referred to a rheumatology clinic. It nevertheless remains unclear how often hip problems affect both hips or co-exist with knee problems, and vice versa, amongst older people in the wider population. Also, while it might be assumed that a person's general health status is considerably more compromised if they have two or more symptomatic hips or knees rather than just one, this issue has received little or no attention; neither has the issue of whether having one particular combination of symptomatic hips and knees

is worse than another. These issues are pertinent to the care of individual patients and to aetiological considerations. They are also of importance to health service provision and planning more generally.

In order to address these issues, we conducted a survey of people aged 65 and over in order to: (i) ascertain the prevalence of hip and/or knee pain in older people; (ii) investigate the patterns of hip and knee symptomatology; and (iii) investigate whether different combinations of symptomatic hips and knees are associated with different levels of overall health status.

Methods

Local research ethics committee approval was obtained for the study [Applied and Qualitative Research Ethics Committee (AQREC); reference A01.060].

Study population

A random sample of 5500 Oxfordshire residents, aged 65 and above, was obtained from the Oxfordshire Health Authority register representing January 2002. A sample size calculation had determined that 3000 respondents would be required to estimate the true prevalence rates of symptomatic hip and knee pain to within less than 1.5% (with 95% confidence). We began with a larger sample in order to allow for inaccuracies of address details

¹Oxford Centre for Health Care Research and Development (OCHRAD), School of Health and Social Care, Oxford Brookes University, ²Division of Public Health and Primary Health Care, Institute of Health Sciences, University of Oxford, ³Wellcome Trust Centre for Human Genetics, University of Oxford and ⁴Nuffield Orthopaedic Centre, Oxford, UK.

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Correspondence to: J. Dawson, Reader in Health Services Research, Oxford Centre for Health Care Research and Development (OCHRAD), School of Health and Social Care, Oxford Brookes University, 44 London Road, Oxford OX3 7PD, UK. E-mail: jdawson@brookes.ac.uk

or vital status, and for the likelihood of non-response from a proportion of people. A postal questionnaire and covering letter was sent out to everyone within a 2-week period in April 2002. The covering letter encouraged respondents to complete the questionnaire with the aid of a partner, relative or friend if they thought they would find that helpful. Non-respondents were sent two reminders and a further copy of the questionnaire.

Response rate

Details regarding the address and vital status of persistent non-responders were checked with the general practitioner (GP) surgery with which the person was registered. The same information was requested for patients residing in nursing or residential homes. Further checks were made using the 2001 electoral roll and British Telecom database. Following these procedures, of the 5500 people originally selected, 119 (2.2%) were found to be deceased and 342 (6.2%) were no longer living at the given address. Of the remaining 5039 eligible people, 1348 (26.8%) did not respond, 201 (4.0%) were unable to participate and 149 (3.0%) did not wish to participate. This left 3341 people who completed and returned a questionnaire, giving a response rate of 66.3% (3341/5039). Age- and sex-specific response rates were as follows: respondents aged 65–74 yr, females 73.1%, males 70.6%; age 75–84 yr, females 62.3%, males 68.3%; age 85 yr and above, females 43.9%, males 54.5%.

Questionnaire

The questionnaire was divided into three sections: a general section, a hip section and a knee section. The general section contained a small number of demographic items and the Anglicized version of the SF-36 general health questionnaire [11, 12]. The SF-36 contains 36 items and is widely used as a generic health status instrument. It provides scores on eight dimensions: physical functioning, social functioning, role limitations due to physical problems, role limitations due to emotional problems, general mental health, energy/vitality, bodily pain and general health perceptions representing the last 4 weeks. There is also an item which addresses health change during the last 12 months. Scores for each dimension range from 0 (poor health) to 100 (good health).

The hip section contained items about current hip symptoms and any previous hip replacement surgery. The section began with a screening question using a modified version of the question used in the National Health and Nutrition Examination survey [13], which has also been used in other studies [3, 6, 8, 9]: 'During the past 12 months, have you had pain in or around either of your hips on most days for one month or longer?' Respondents who reported symptoms were asked additional questions about their hip problem. The corresponding knee section was identical to the hip section except that the word 'knee' replaced the word 'hip'. The order of the hip and knee sections was reversed in half of the questionnaires. This was to ensure that the completion rate for the screening question—and hence the prevalence rate—in each section was not biased by its position in the questionnaire.

Statistical analysis

The age- and sex-specific prevalence rates for self-reported hip and knee pain were calculated using the hip and knee screening questions. We examined whether the position of the hip and knee sections within the questionnaire had an effect on the completion of the screening questions, and hence the prevalence rate, using Pearson's χ^2 test. The age- and sex-specific rates of previous joint replacement were also calculated and the relationship with self-reported hip and knee pain was examined.

Respondents who reported hip or knee pain were grouped according to the number and combination of hip and knee joints affected (within the last 12 months) and the eight dimensions of the SF-36 were calculated for each group. SF-36 scores were reported as medians and analysed with non-parametric methods as appropriate for ordinal composite measurement scales that have a skewed distribution [14, 15]. The developers of the SF-36 suggest a method by which missing values may be imputed. However, others have demonstrated that this may be an inappropriate method for many of the items in quality-of-life questionnaires and can result in biased or misleading estimates [16]. We therefore did not do this, and no overall dimension score has been computed where an individual left an item unanswered within that dimension.

We hypothesized that the SF-36 physical functioning, role limitation (physical) and bodily pain dimensions would be the elements of general health most directly affected by hip and knee symptoms. A non-parametric test for trend [17] was used to test for a relationship between these three dimensions and the number of painful hip and knee joints that were involved (none, one, two, three or four). Pairwise comparisons of SF-36 scores were made using the Wilcoxon rank-sum test for the following groups: unilateral hip *vs* unilateral knee; bilateral hip *vs* bilateral knee; and ipsilateral *vs* contralateral (one hip and one knee).

All analyses were conducted using STATA 8.0 (StataCorp LP, TX, USA; available via Timberlake Consultants Ltd, London, UK).

Results

Table 1 shows the socio-demographic characteristics for all 3341 respondents. These are shown alongside data for older adults from the 2001 Census and General Household Survey (GHS) in Britain [18], where GHS data were available and directly comparable.

Prevalence of symptomatic hips and knees

The age- and sex-specific prevalence rates for self-reported hip and knee pain are presented in Table 2. The overall prevalence rate was 19.2% [95% confidence interval (CI) 17.9–20.6] for people affected by hip pain and 32.6% (95% CI 31.0–34.3) for knee pain, each lasting for 1 month or longer in the previous year. This corresponded to 11.0% (734/6682) of individual hip joints and 21.5% (1439/6682) of knee joints. The proportion of people reporting hip pain was the same regardless of whether the hip or the knee section was positioned first in the questionnaire. This was also the case for the proportion of people reporting knee pain ($P > 0.2$ in both cases). A substantial number of people reported both hip and knee pain (11.3%, 95% CI 10.2–12.5). The overall prevalence of having either hip or knee pain was 40.7% (95% CI 38.9–42.4). Of all respondents, 56.8% (221/389) people with hip pain had visited their GP about the problem *vs* 64.1% (524/818) of those reporting knee pain.

Table 3 shows the percentage of respondents who had ever had a hip or knee replacement by age and sex. Overall, 7.5% reported a previous hip replacement and 3.9% a previous knee replacement. The high proportion of very elderly women who had had a hip replaced ($>18\%$) was particularly apparent. The proportion of people who reported hip pain was higher in those who had previously had a hip replacement (THR) compared with those who had not (hip pain/past THR, 105, 46.5%; no THR, 504, 17.5%, $P < 0.001$). An equivalent finding related to pain and past knee replacement (TKR) (knee pain/past TKR, 71, 61.2%; no TKR, 965, 32.2%, $P < 0.001$).

Figure 1 shows the combination of hip and knee joints affected in people reporting (A) hip pain ($n = 602$) and (B) knee pain ($n = 1034$). Ten people were excluded due to insufficient data on the number of joints affected (two hip cases, two knee cases and six hip

TABLE 1. Socio-demographic characteristics of respondents

	Respondents (<i>n</i> = 3341) Number (%)	2001 Census and General Household Survey, Adults aged ≥65 (%)
Age (yr) and sex		
Males (<i>n</i> = 1557)		
65–74	915 (27.4)	24.6
75–84	540 (16.2)	13.9
≥85	102 (3.1)	3.3
Females (<i>n</i> = 1784)		
65–74	944 (28.3)	28.2
75–84	654 (19.6)	21.2
≥85	186 (5.6)	8.7
Marital status (<i>n</i> = 3271)		
Married	2018 (61.7)	53.6
Widowed	882 (27.0)	32.7
Other	371 (11.3)	12.7
Lives alone (<i>n</i> = 3267)	1018 (31.2)	36.9
Housing (<i>n</i> = 3189)		
Home owner	2534 (79.5)	66.4
Social sector tenants	453 (14.2)	29.3
Private renters	202 (5.1)	5.0
Born in Britain or Ireland (<i>n</i> = 3256)	3047 (93.6)	— ^a
Ethnic group (<i>n</i> = 3150)		
White	3108 (98.7)	97.4 ^b
Black, Asian or other	42 (1.3)	2.6
Education		
School qualifications (<i>n</i> = 3143)	1197 (38.1)	—
Degree (<i>n</i> = 3086)	417 (13.5)	—
Professional qualification (<i>n</i> = 3060)	858 (28.0)	—
Transport		
Car/van available for use (<i>n</i> = 3184)	2235 (70.2)	72 ^c
Holds a drivers licence (<i>n</i> = 3182)	2095 (65.8)	—
Drives at least once/week (<i>n</i> = 3130)	1824 (58.3)	—
Smoking		
Current regular smoker (<i>n</i> = 3206)	230 (7.2)	14.3 ^d
Not current, smoked in last 5 yr (<i>n</i> = 2555)	99 (3.9)	—
Body mass index		
Males (<i>n</i> = 1477)		
< 23	303 (20.5)	—
≥23 and < 25	369 (25.0)	—
≥25 and < 30	651 (44.1)	—
≥30	154 (10.4)	—
Females (<i>n</i> = 1679)		
< 23	536 (31.9)	—
≥23 and < 25	354 (21.1)	—
≥25 and < 30	546 (32.5)	—
≥30	243 (14.5)	—

^aData not available; ^bpercentage based on the UK excluding Northern Ireland; ^cpercentage based on households not persons; ^dpercentage in adults aged ≥65 yr in England only.

TABLE 2. Prevalence of self-reported pain in either hip or either knee

Age (yr)	Sex	All respondents	Self-reported hip pain		Self-reported knee pain		Self-reported hip and knee pain		Self-reported hip or knee pain	
			<i>n</i>	Rate ^a (%) (95% CI)	<i>n</i>	Rate ^a (%) (95% CI)	<i>n</i>	Rate ^a (%) (95% CI)	<i>n</i>	Rate ^a (%) (95% CI)
65–74	M	915	132	14.7 (12.4–17.1)	233	26.1 (23.2–29.1)	62	7.0 (5.4–8.9)	303	33.6 (30.5–36.8)
	F	944	209	23.1 (20.4–26.0)	328	36.2 (33.1–39.5)	122	13.9 (11.7–16.4)	415	45.5 (42.2–48.7)
75–84	M	540	90	18.0 (14.7–21.6)	158	31.0 (27.0–35.2)	50	10.4 (7.8–13.5)	198	38.8 (34.6–43.2)
	F	654	124	20.7 (17.6–24.2)	230	37.4 (33.6–41.4)	77	13.4 (10.7–16.5)	277	45.0 (41.1–49.1)
≥85	M	102	18	18.8 (11.5–28.0)	32	32.3 (23.3–42.5)	10	10.5 (5.2–18.5)	40	40.4 (30.7–50.7)
	F	186	37	21.0 (15.3–27.8)	61	35.5 (28.3–43.1)	26	15.6 (10.4–22.0)	72	41.9 (34.4–49.6)
Total (crude rate)		3341	610	19.2 (17.9–20.6)	1042	32.6 (31.0–34.3)	347	11.3 (10.2–12.5)	1305	40.7 (38.9–42.4)

^aRespondents with missing values for the screening question are not included in the denominator.

M, male; F, female.

TABLE 3. Percentage of respondents with a previous hip or knee joint replacement by age and sex

Age (yr)	Sex	All respondents	Ever had a hip replaced		Ever had a knee replaced	
			<i>n</i>	Rate (%) (95% CI) ^a	<i>n</i>	Rate (%) (95% CI) ^a
65–74	M	915	41	4.6 (3.4–6.2)	20	2.3 (1.4–3.5)
	F	944	49	5.5 (4.1–7.3)	21	2.4 (1.5–3.6)
75–84	M	540	36	7.2 (5.1–9.9)	22	4.4 (2.8–6.5)
	F	654	67	11.3 (8.9–14.1)	46	7.6 (5.6–10.0)
≥85	M	102	9	9.5 (4.4–17.2)	4	4.1 (1.1–10.2)
	F	186	32	18.3 (12.9–24.8)	8	4.6 (2.0–8.9)
Total		3341	234	7.5 (6.6–8.5)	121	3.9 (3.2–4.6)

^aRespondents with missing values for the hip replacement question are not included in the denominator.

M, male; F, female.

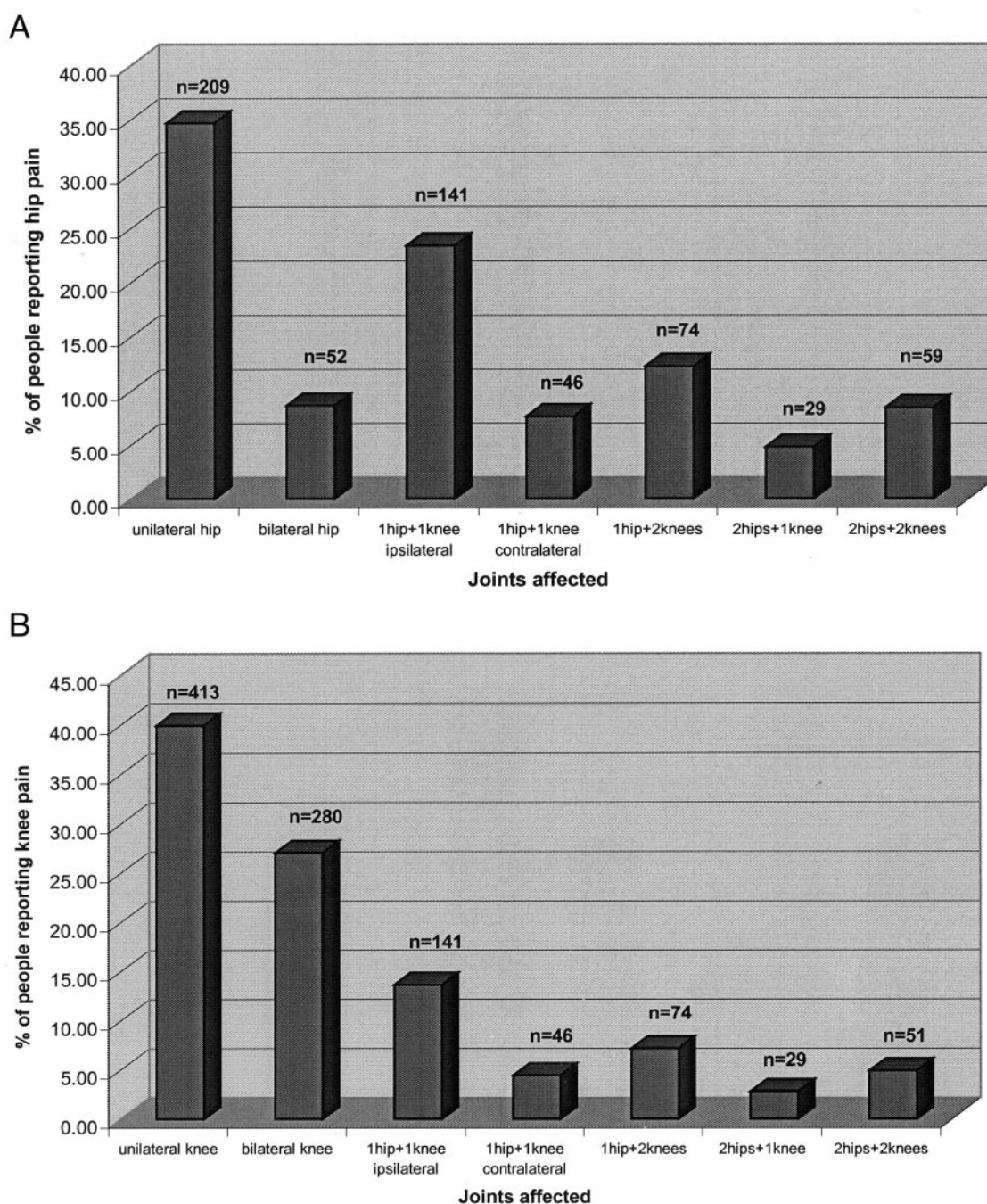


FIG. 1. Combination of affected hip and knee joints in people reporting hip and knee pain. (A) People reporting hip pain. (B) People reporting knee pain.

and knee cases). The two groups (A) and (B) are not mutually exclusive—people reporting both hip and knee pain are counted once in each group. Of people reporting hip pain, 34.7% were affected unilaterally and 8.6% affected bilaterally in the hip joints alone (Fig. 1A). By comparison, 39.9% of people reporting knee pain were affected unilaterally and 27.1% bilaterally in the knee joints alone (Fig. 1B). Overall, just under half (622/1295, 48%) of those with hip or knee pain were affected unilaterally in one hip or knee joint only. The proportion of people reporting hip pain who also reported pain in at least one knee joint was 56.6%. Conversely, the proportion of people reporting knee pain who also reported pain in at least one hip joint was 33.0%.

Overall health status in relation to symptomatic hip and knee joints

Table 4 reports the median and interquartile range of values for the eight dimensions of the SF-36 for respondents reporting hip or knee pain, grouped according to the number and combination of hip and knee joints affected. Physical function, physical role limitation and bodily pain scores decreased significantly (worsened) as the number of symptomatic hip and knee joints increased from none to all four affected ($P < 0.001$ for all three dimensions). There were no differences in these three dimension scores between patients with a unilaterally affected hip *vs* a unilaterally affected knee, or between people affected ipsilaterally (same side) *vs* contralaterally (opposite side) with one hip and one knee. In the bilateral groups, the hip cases reported significantly worse bodily pain scores compared with the knee cases [44.4, interquartile range 22.2–55.6 and 55.6, interquartile range 33.3–66.7, respectively], while the physical function and physical role limitation scores did not differ significantly.

For the purpose of comparison with other studies in which only mean values have been reported, the means (standard deviations) for the eight SF-36 dimensions representing the sample as a whole were as follows: physical functioning 66.0 (30.1); role limitations due to physical problems 64.3 (41.9); bodily pain 69.8 (26.6); general health perceptions 64.1 (20.6); energy/vitality 58.9 (21.5); social functioning 81.9 (26.2); role limitations due to emotional problems 80.4 (34.7); and mental health 78.5 (16.3).

Discussion

Using a cross-sectional survey approach, the aim of this study was to obtain prevalence rates for symptomatic hips and knees within the age group that is most affected by joint disease and mobility problems—those aged 65 yrs and over. We also examined how frequently symptomatic hips and knees occurred together and in what combinations. Finally, we investigated the relationship between the different combinations of symptomatic hips and knees with overall health status.

Our first finding was an optimistic one from the perspective of those approaching 65 yr: that the majority (almost 60% of the 3341 people who responded) had no persistent hip or knee pain during the preceding year. Also, the proportion of people reporting hip or knee pain did not increase substantially with age. There were differences between male and female rates of reporting hip and knee pain in the 65–74 age group, with rates higher for females. These findings are supported by the work of others [3, 19]. There are a number of possible explanations for these findings, including those that relate to gender differences in illness behaviour [20, 21], although further research on this issue is warranted.

Our finding that people who had undergone past joint replacement were around twice as likely to report current joint pain as those who had not underlines the fact that joint replacement is not always successful in the long term and that many such operations

will need revising where people survive for a decade or two beyond the original operation. While it is generally held that joint replacement is a very successful operation, reliable long-term follow-up studies of hip and knee replacement are lacking and generally rely on revision rates to denote failure. This represents an insensitive measure by comparison with assessments, such as standard measures of pain severity, that are obtained directly from patients [22, 23].

Around one-fifth of the sample was affected by hip pain and a third had knee pain. There was some overlap, however, with over half of the hip cases also reporting knee pain, *vs* around one-third of the knee cases also reporting hip pain. Nevertheless, this too proved to be an oversimplification because, by stating the prevalence in terms of the number of people affected by hip /knee pain, as previous studies in this area have tended to emphasize [3, 6, 9], the figures obscured the fact that more than half of those with a painful hip or knee had symptoms in more than one hip or knee joint, chiefly involving both legs. This issue of bilaterality is pertinent to all studies concerned with disease prevalence, health status assessment or treatment outcomes in which the organ of interest occurs as a pair, but it is particularly important in relation to weight-bearing joints, where impairment of either of a number of paired joints (hips, knees, ankles) has the potential to undermine mobility.

Other findings of interest concerned the patterns of symptoms affecting hip and knee joints; bilateral knee symptoms were found to be far more common than bilateral hip symptoms (27.1 *vs* 8.6%). In addition, considerably more than half of the hip pain sufferers also had a painful knee, compared with a third of people with knee pain who also reported hip pain. The differences in these patterns may be of aetiological significance, although the cross-sectional nature of our data did not allow any exploration of the temporal relationship between different symptomatic joints. Our hip/knee pain screening questions generated a 12-month period prevalence of joint pain on most days of 1 month. This did not allow us to specify precisely the nature of the temporal relationship between different episodes of joint pain.

From a clinical management perspective, where individuals reported more than one symptomatic joint, it is unlikely that all of these originally developed symptoms at precisely the same time. This raises the question of whether treating symptoms effectively in one joint might allay, delay or prevent symptoms from developing in another. Also, if surgical treatment of one weight-bearing joint occurs only after another joint has developed symptoms, it seems likely that rehabilitation will be hampered, perhaps substantially so.

Mean scores for SF-36 dimensions were found to be considerably lower (worse) than their corresponding median values. This reflected the skewed nature of the data, a minority of people in particularly poor health being responsible for 'dragging the mean' in a downward direction. Using the SF-36 data, we investigated the relationship between general health status and the number of different weight-bearing joints affected. Here, those who reported no symptomatic hip or knee joints had extremely high (good) scores generally, which were commensurate with normative data representing people who are younger than 65 [24]. By contrast, respondents who had three or four symptomatic hip and knee joints had scores that were generally worse than the average scores for people over the age of 85 [24]. There was a significant dose-response relationship for the physical function, physical role limitation and bodily pain dimensions and the number of weight-bearing joints affected. This finding is not surprising, but has not been demonstrated previously.

Also relevant to the SF-36 analysis, our rates of hip and knee pain are based upon respondents' perception of the origin of their pain. In some cases, this pain may be referred pain; e.g. a diseased hip may create the perception of pain emanating from the knee (on the same side) as well as from the hip. The significant SF-36 dose-response relationship relating to the number of

TABLE 4. SF-36 dimension scores for whole sample and people reporting hip or knee pain, by combination of joints affected

No. of hip and knee	Combination of hip and knee joints affected	No. (%) of patients (<i>n</i> = 3341)	Physical functioning median (IQR)	Role limitation (physical) median (IQR)	Bodily pain median (IQR)	General health perception (IQR)	Energy/vitality median (IQR)	Social functioning median (IQR)	Role limitation (emotional) median (IQR)	Mental health median (IQR)	Change in health median (IQR)
	Whole sample	3341 (100)	75 (45–90)	100 (25–100)	77.8 (44.4–88.9)	65 (50–80)	60 (45–75)	100 (66.7–100)	100 (66.7–100)	84 (68–92)	50 (50–50)
0 joints	None affected	2036 (60.9)	85 (65–95)	100 (50–100)	88.9 (66.7–100)	70 (55–80)	65 (50–80)	100 (88.9–100)	100 (100–100)	84 (72–92)	50 (50–50)
1 joint	Unilateral hip	209 (6.3)	65 (40–85)	62.5 (0–100)	66.7 (44.4–77.8)	60 (45–75)	55 (40–70)	88.9 (66.7–100)	100 (66.7–100)	80 (64–92)	50 (50–50)
	Unilateral knee	413 (12.4)	65 (35–80)	75 (0–100)	55.6 (44.4–77.8)	65 (50–75)	60 (45–70)	88.9 (66.7–100)	100 (66.7–100)	80 (68–92)	50 (50–50)
2 joints	Bilateral hip	52 (1.6)	57.5 (30–85)	25 (0–100)	44.4 (22.2–55.6)	55 (40–70)	40 (25–60)	72.2 (44.4–100)	66.7 (0–100)	68 (56–84)	50 (25–50)
	Bilateral knee	280 (8.4)	45 (20–75)	25 (0–100)	55.6 (33.3–66.7)	55 (40–70)	50 (35–65)	77.8 (44.4–100)	100 (33.3–100)	76 (64–88)	50 (25–50)
	1 hip + 1 knee ipsilateral	141 (4.2)	40 (15–70)	25 (0–75)	44.4 (33.3–66.7)	55 (40–70)	50 (35–65)	66.7 (44.4–100)	100 (33.3–100)	76 (64–88)	50 (25–50)
	1 hip + 1 knee contralateral	46 (1.4)	50 (15–80)	50 (0–100)	44.4 (22.2–66.7)	55 (45–65)	52.5 (40–65)	88.9 (44.4–100)	100 (66.7–100)	72 (60–84)	50 (50–50)
3 or 4 joints	2 hips + 1 knee	29 (0.9)	37.5 (25–65)	25 (0–50)	44.4 (33.3–55.6)	50 (40–75)	45 (25–60)	66.6 (44.4–88.9)	66.7 (0–100)	74 (54–84)	50 (50–50)
	1 hip + 2 knees	74 (2.2)	30 (10–65)	0 (0–50)	44.4 (22.2–55.6)	50 (30–65)	40 (25–50)	45 (44.4–100)	66.6 (0–100)	74 (60–80)	50 (25–50)
	2 hips + 2 knees	51 (1.5)	25 (5–55)	0 (0–25)	33.3 (22.2–55.6)	47.5 (30–70)	40 (25–60)	61.1 (33.3–88.9)	100 (33.3–100)	72 (60–84)	25 (25–50)

Ten people were excluded due to insufficient data on the number of joints affected (2 hip cases, 2 knee cases and 6 hip and knee cases).

weight-bearing joints that were perceived as painful suggests that it is the perception of pain and its origin(s), rather than the actual presence of disease in more than one joint, that is important where impaired function is concerned.

There are a number of strengths and limitations of our study that should be borne in mind. First, although we concentrated on older age groups, the study respondents had a relatively young age distribution, reflecting poorer response rates amongst the oldest old. In addition, within the oldest age band, 42% of females were aged 90 and above compared with 26% of men. This is a likely explanation for the particularly low response rate for elderly females, as non-completion is associated with increasing age [25]. Next, compared with 2001 GHS data,¹⁸ our sample also appeared somewhat wealthier (~80% owned their own home) and healthier (only ~7% reported being a current smoker) than the general UK population. The proportion of respondents who owned their own home is actually closer to the 2002 figure for southeast England alone (75%, all ages [26]) than for the UK. Our sample is therefore broadly representative of elderly people in the southeast of England. Our findings may therefore present a more positive picture of the prevalence of hip and knee pain, and of health status more generally, than is the case amongst all people over 65 yr nationally.

The order in which questions appear in a questionnaire has previously been shown to affect response rates [27]. This factor might also have affected the completion rate for the screening questions and hence the prevalence rates that we obtained for hip and knee symptoms had we not reversed the order of hip and knee sections in 50% of our questionnaires. In fact, the order made no difference to the rates obtained.

The self-reported prevalence rates for hip and knee pain that we obtained are higher than estimates reported previously in other population surveys that used similar definitions [3, 6, 9]. The most likely reason for this relates to the older age range of our sample; comparative studies included people who were either over the age of 35 or over 40 yr. A community study of musculoskeletal disorders that included a reasonable proportion of people aged 75 yr or older found rates that were more similar to our own [19]. Nevertheless, the accuracy of our crude overall prevalence rate is likely to have been affected by the fact that older women are under-represented and younger men are over-represented in our survey.

Overall, our study has revealed the complexity of hip and knee symptomatology in older people. This raises a number of methodological issues for outcomes measurement where the evaluation of health care interventions is concerned with hip and knee pain. The first issue is that the necessary level of complexity entailed in any analysis translates into a need for large sample sizes. Another issue concerns the unit of analysis. In recent years, measures of health status have increasingly involved patient-focused questionnaires. Such measures vary in the specificity of their focus. Thus, some measure the overall general health of the person and others are somewhat more specific and relate to a particular condition or area of function (e.g. mobility). The most specific measures focus on one particular part of the body (e.g. a joint). Issues raised in this study inevitably lead to the question: under what circumstances should the person be taken as the unit of analysis as opposed to the (one) joint itself? The answer to this question, which will probably differ in different circumstances, has implications for the choice of health status instrument used.

Finally, our study findings suggest that hip and knee symptoms are largely responsible for the poor health status of a considerable proportion of the elderly population. Our data also support the notion that the eradication of hip and knee symptoms in elderly people might well raise their average general health status to the level currently enjoyed by people under the age of 65.

The authors have declared no conflicts of interest.

Rheumatology	Key messages
	<ul style="list-style-type: none"> • Elderly people with persistent hip or knee pain are likely to have symptoms in more than one of these joints. • There is a dose-response deterioration in general health status associated with each extra hip or knee that is symptomatic. • Without hip and knee symptoms, the average general health status of elderly people would be similar to that of the under-65s.

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