# RHEUMATOLOGY

## Original article

# Musculoskeletal foot problems in primary care: what influences older people to consult?

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## Abstract

**Objective.** To estimate the incidence of, and factors associated with, consultation for musculoskeletal foot problems in primary care.

**Methods.** Survey data from 13 986 people aged $\geqslant$50 years who took part in the North Staffordshire Osteoarthritis Project were linked to a database of primary care consultations. Foot problems were defined as responding affirmatively to the questions: 'Have you had any problems with your feet over the last year?' or 'Have you had pain in the last year in and around the foot?'. The main outcome measure was a record of a musculoskeletal foot-related consultation within 18 months following the survey.

**Results.** Of the 3858 participants with foot problems who had not consulted before the survey, 350 (9.1%) consulted in the 18 months following the survey. Age, sex, education, general health and pain in other regions were not associated with future consultation. However, those who consulted were more likely to have reported foot pain [adjusted odds ratio (OR) 2.04; 95% CI 1.22, 3.42) and to consider treatments to be effective in controlling disease (OR 1.54; 95% CI 1.07, 2.21) in the baseline survey, and to have been a frequent consulter in the 18 months before the survey (OR 1.65; 95% CI 1.30, 2.09).

**Conclusions.** Only a minority of older people with musculoskeletal foot problems consult their general practitioner about them. Foot pain, frequent consultation for other problems and positive perceptions of treatment efficacy appear to be the strongest factors influencing future consultation.

**Key words:** Foot deformities, Osteoarthritis, Pain, Consultation.

## Introduction

Musculoskeletal foot problems are highly prevalent in older people. Population-based studies indicate that between 20 and 40% of older people report pain in their feet [1–3], and a substantially higher proportion have clinically assessed foot conditions such as hallux valgus (bunions) and lesser toe deformities [4, 5]. A range of health professionals are involved in the management of foot problems, including general practitioners (GPs), podiatrists, chiropodists, nurses, physiotherapists, orthopaedic surgeons, rheumatologists and orthotists [6]. In the UK, the GP is most commonly the first point of contact with the health-care system, and we have recently reported that musculoskeletal foot and ankle problems such as heel pain, metatarsalgia and toe problems account for a substantial number of consultations in primary care [7].

Several studies have been undertaken to investigate both the frequency of, and factors associated with, primary care consultation for musculoskeletal problems, most commonly in relation to back pain [8, 9] and knee pain [10–12]. Many of these studies have adopted the Andersen–Newman behavioural model of health-care utilization to explore consultation behaviour, which suggests that the decision to access medical care is influenced not only by need-related factors (such as pain severity and duration), but also by predisposing factors (such as age, sex, education and perceptions of illness) and enabling factors (such as income, access to services and level of social support) [13].

The factors that influence an older person's decision to consult their GP about foot problems, however, have not been evaluated in detail. This is an important area to examine for two main reasons. First, foot problems can

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have a considerable impact on balance [14] and mobility [4, 15] in this population, and have been identified as a risk factor for falls [16]. Secondly, there is some evidence that many older people consider foot problems to be an inevitable consequence of ageing [17], and therefore do not seek treatment for them from health professionals [18]. As such, it is possible that a substantial proportion of chronic foot problems in the community are not being adequately managed.

The objectives of this study were therefore to (i) determine the incidence of GP consultation for older people with foot problems and (ii) explore the predisposing, enabling and need-related factors that may influence the decision to consult. To do this, we identified a group of people with foot problems from a population-based survey of musculoskeletal pain and linked these data to a database of primary-care consultations.

## Methods

### Participants

Participants were drawn from two phases of the North Staffordshire Osteoarthritis Project (NorStOP), the details of which have been described elsewhere [19, 20]. In summary, the sampling frame consisted of all adults aged $\geqslant 50$ years registered with six general practices from the Keele GP Research Partnership (KGPRP). In the UK, >95% of people are registered with a general practice, so general practice registers provide a convenient frame for sampling a local population [21]. The first phase of recruitment was conducted in April 2002, and achieved a response rate of 71.3% ($n = 7878$ from 11 055 eligible people) [2]. The second phase of recruitment was conducted between July 2002 and May 2003 and achieved a response rate of 69.7% ($n = 6108$ from 8763 eligible people) [22].

Of the total sample of 13 986 people, 5358 (38.3%) responded affirmatively to the question 'Have you had any problems with your feet over the last year?' and 5286 (37.8%) responded affirmatively to the question 'Have you had pain in the last year in and around the foot?'. The total number of people reporting either foot problems or foot pain was 5706 (40.8%), and this group formed the study population for the analysis. Of these, 4402 consented to medical record review (77.1%). Those who consented to medical record review were more likely to be male (40.4 *vs* 32.1%; $P < 0.001$), and slightly younger [mean 67.1 (S.D. 10.2) *vs* 68.6 (10.8) years; $P < 0.001$] than those who did not consent.

### Health survey

The NorStOP health survey consisted of an extensive health questionnaire incorporating questions relating to socio-demographics, general health, physical function, participation and bodily pain [19]. For the purpose of this study, we selected sections of the questionnaire that broadly reflected the three components of the Andersen–Newman behavioural model of health-care utilization (i.e. predisposing, enabling and need-related factors), which included socio-demographics (age, sex and education level), anthropometrics [height, weight and obesity (BMI $\geqslant 30 \, \text{kg/m}^2$)], general health {Short Form 36 physical function subscale (SF-36) [23]} and bodily pain (pain lasting a day or more in the past 4 weeks, marked on a full-body manikin). Widespread pain was defined as pain shaded on the manikin in the axial skeleton or low back plus at least two areas of two contra-lateral limbs [24].

Symptoms of anxiety and depression were assessed using the Hospital Anxiety and Depression Scale (HADS) [25]. The HADS consists of 14 items: 7 for anxiety and 7 for depression, each recorded on a 4-point response scale (possible range of each dimension: 0–21) with high scores indicating higher levels of symptoms. Scores of 0–7 are considered 'normal', 8–10 are 'suggestive' of a disorder and scores of $\geqslant 11$ indicate probable 'caseness' of a disorder. Both sub-scales correspond well with psychiatric diagnosis [25].

Perceptions of illness and treatment efficacy were assessed using a series of 10 statements scored on a 5-point Likert scale, ranging from 'strongly disagree' to 'strongly agree'. These statements, derived from the Revised Illness Perceptions Questionnaire [26], provide an indication of the participant's sense of control over their illness, their perception of the effectiveness of treatments for musculoskeletal problems and their level of fear of pain associated with their condition.

### Medical record review

The six practices from which consultation data were obtained are part of the KGPRP and, as such, undergo a cycle of assessment, feedback and training in the use of computerized morbidity coding [27]. Morbidity information from consultations are documented using Read codes and terms, a commonly used hierarchical coding system in UK primary care [28]. GPs are requested to enter at least one morbidity term for every contact. Although the use of diagnostic terms is encouraged, symptom terms may also be used until a diagnosis is reached. We have previously shown that 93% of GP contacts at practices within the KGPRP are given a morbidity term [27], and that musculoskeletal disease prevalence estimates are comparable with the National Royal College of General Practitioners Weekly Returns Service database [29]. For each participant, all consultations documented in the practice records for the 18 months before their response to the survey and for the 18 months after the survey period were extracted.

Read terms were allocated to a body region using a protocol described in detail previously [30]. Briefly, four GPs allocated relevant musculoskeletal Read terms under Chapters N (Musculoskeletal and connective tissues diseases), R (symptoms, signs and ill-defined conditions), S (injury and poisoning) and one (history/symptoms) to the individual body regions. If no region could be allocated, then the code was defined as 'unspecified'. 'Unspecified' problems tended to be codes

where either no region was described in the associated Read term (e.g. 'arthralgia') or the problem covered more than one region (e.g. 'generalized osteoarthritis'). The defined regions were then grouped into four main body sectors: (i) head/neck, (ii) torso, (iii) upper limb and (iv) lower limb. The lower limb sector included consultations specified as foot, ankle, lower leg, knee, thigh, hip and pelvis. Participants in the study were classified as 'consulters' or 'non-consulters' in the 18 months before and 18 months after the survey based on whether they had a foot or ankle consultation documented in their general-practice records. The North Staffordshire local research ethics committee approved the study and written informed consent was obtained from all participants.

### Statistical analysis

Variables considered to be possible predictors of consultation were dichotomized before analysis. Participants who scored below the lowest tertile on the SF-36 physical function scale were defined as having 'low' physical function, whereas those who scored $\geqslant 8$ on each of the HADS scales were defined as having symptoms of anxiety or depression, respectively. Responses to the 10 questions regarding perceptions of illness and treatment efficacy were dichotomized, with 'agree' or 'strongly agree' responses documented as a 'yes', and all other responses documented as a 'no'. The number of consultations in the 18 months before the survey was converted based on quartiles, with participants above the upper quartile defined as 'frequent consulters'. Differences between participants who did and did not consult in the 18 months following the survey were first analysed by calculating unadjusted odds ratios (ORs) and 95% CIs. All significant predictors ($P < 0.05$) were then entered into a direct (simultaneous) logistic regression model. Analyses were performed using SPSS 15.0 for Windows (SPSS Inc., Chicago, IL, USA).

### Results

Of the total sample, 5706 (40.8%) participants were defined as having a foot problem, and 4402 (77.1%) of these consented to medical record review. A total of 544 (12.4%) had a record of a previous consultation for a musculoskeletal foot problem, and 118 (21.7%) of these continued to consult for a musculoskeletal foot problem in the 18 months after the survey (Fig. 1).

Of the 3858 participants who had not consulted for a musculoskeletal foot problem before the survey, 350 (9.1%) consulted for a musculoskeletal foot problem in the 18 months following the survey. The 10 most frequently documented Read terms for foot-related consultations in this group are shown in Table 1.

In the unadjusted analysis, age, sex, education, general health and pain in other regions were not associated with future consultation (Table 2). Analysis of the HADS anxiety and depression sub-scales using the cut-off value of $\geqslant 11$ rather than $\geqslant 8$ did not alter these findings (data not shown). However, those who did consult for their foot problem were more likely to have reported foot pain

in the baseline survey and to have been a frequent consulter for other problems in the 18 months before the survey. Those who consulted for their foot problem were also more likely to agree or strongly agree with the statements 'Treatments are effective in controlling disease' and 'The thought of pain makes me afraid' in the baseline survey (Table 3).

In the final logistic regression model, reporting foot pain (OR 2.04; 95% CI 1.22, 3.42), being a frequent consulter (OR 1.65; 95% CI 1.30, 2.09) and agreeing or strongly agreeing with the statement 'Treatments are effective in controlling disease' (OR 1.54; 95% CI 1.07, 2.21) were significantly associated with future consultation for a musculoskeletal foot problem. The model was statistically significant [$\chi^2 = 35.8$, degrees of freedom (df) = 4, $P < 0.001$] and goodness of fit was acceptable (Hosmer and Lemeshow $\chi^2 = 1.61$, df = 5, $P = 0.90$; Table 4).

## Discussion

The first objective of this study was to estimate the cumulative incidence of primary-care consultations for musculoskeletal foot disorders in older people. Overall in our sample, this was low, with only 9.1% of those reporting foot problems in the population survey registering a consultation in the 18 months following the survey. Although we specifically excluded people who had consulted their GP for a foot problem before the survey in order to focus on new episodes of care, the prevalence of previous consultation for foot problems in all persons reporting pain at baseline was also low (12.4%). To the best of our knowledge, this is the first analysis undertaken focusing on primary-care consultation for foot disorders in the UK. Interestingly, a higher frequency of GP consultation (26%) was reported in a Dutch study involving 1130 people with non-traumatic foot complaints aged >65 years [31]; however, this disparity could be at least partly explained by the cross-sectional design and the older age of their sample.

The low rate of consultation for musculoskeletal foot problems could be interpreted as a measure of unmet need; however, it is also possible that some proportion of those not consulting their GP seek care from other health professionals, such as podiatrists [6]. Although the GP is the most frequently consulted medical practitioner for musculoskeletal disorders and plays a major gate-keeper role in the UK health-care system [32], no referral is required to access private podiatry services. As we did not ask participants whether they had sought treatment from other health-care providers, it is not possible to estimate to what extent this could have influenced the consultation rate observed. In the aforementioned Dutch primary care study, 18% of older people sought treatment for their foot problems from podiatrists, pedorthists or physiotherapists [31]. Similarly, in the Cheshire Foot Pain and Disability Survey [33], the most commonly consulted health professional in those with foot pain was a podiatrist. These findings suggest that non-medical health-care providers are responsible for managing a significant caseload of foot problems in the

FIG. 1 Number of patients who did and did not consult their GP about their musculoskeletal foot problem 18 months before and 18 months after the survey.
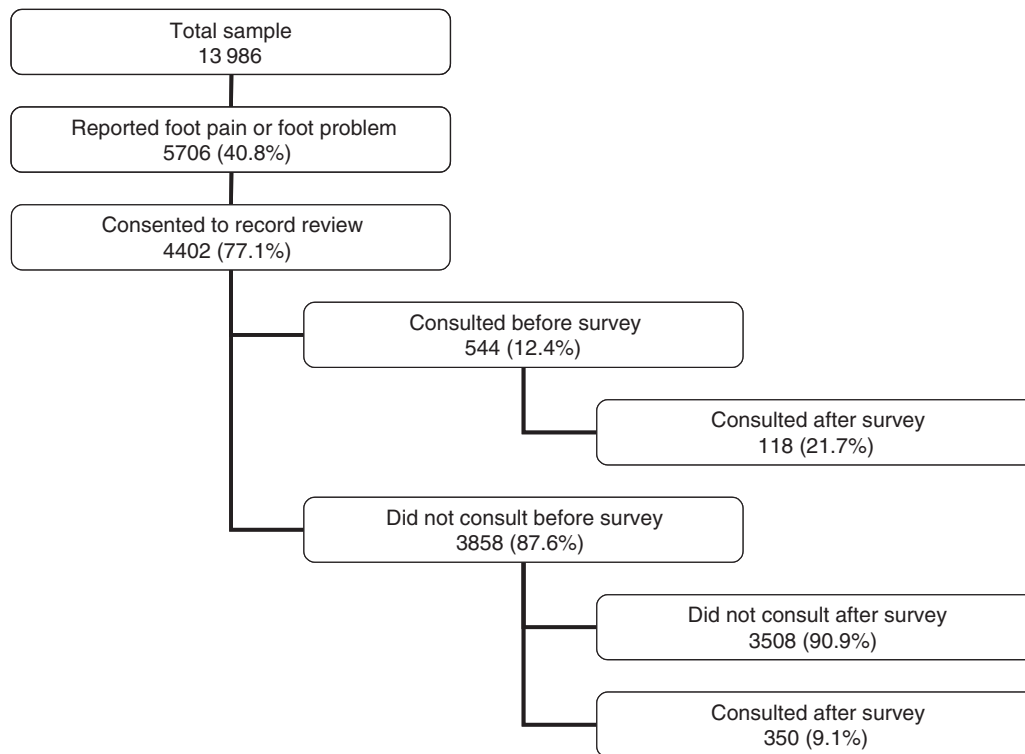


TABLE 1 Ten most commonly documented Read terms for musculoskeletal foot problem consultations

| Read term | n (%) |
|---|---|
| Foot pain | 239 (25.8) |
| Ankle pain | 85 (9.2) |
| Plantar fasciitis | 82 (8.9) |
| Ankle swelling | 51 (5.5) |
| Toe pain | 51 (5.5) |
| Metatarsalgia NOS | 33 (3.6) |
| Heel pain | 32 (3.5) |
| Ankle joint pain | 28 (3.0) |
| Arthralgia—ankle/foot | 27 (2.9) |
| Calcaneal spur | 21 (2.3) |

NOS: not otherwise specified.

community. However, whether the level of provision of podiatry services in the UK is sufficient to meet this demand is uncertain, as it has previously been estimated that ~40% of older people who require podiatry do not currently receive it [34].

The most commonly documented Read terms for musculoskeletal foot-related consultations were non-specific foot pain (26%) and ankle pain (9%). Despite the fact that our sample was limited to those aged >50 years, this observation is consistent with our previous analysis of

general-practice consultation data across all age groups [7], and indicates that although GPs within our network are encouraged to use specific diagnostic terms, many musculoskeletal foot conditions are sub-optimally coded. While the selection of non-specific symptom codes could in some cases be attributed to limited knowledge of foot problems [35, 36], it is also possible that a definitive diagnosis was not yet available for many of the consultations recorded in the database.

The second objective of this study was to explore factors that may influence an older person's decision to consult their GP for treatment of musculoskeletal foot problems. To do this, we adopted the Andersen–Newman behavioural model of health-care utilization, which suggests that the decision to access medical care is influenced by predisposing, enabling and need-related factors [13]. However, our analysis indicates that few of these factors influence future consultation for a musculoskeletal foot problem. The only measures found to be significantly associated with future consultation were foot pain (which could be considered a need factor), previous frequent consultation for other conditions (which could be considered an enabling factor), reporting fear at the thought of pain and believing that treatments were effective in controlling disease (both of which could be considered predisposing factors). Other need-related factors, such as low physical function and presence of comorbidities, were not associated with future

TABLE 2 Associations of future consultation for a musculoskeletal foot problem with sex, age-group, education, general health, pain and frequency of previous consultation

| Factor | All participants (n = 3858), n (%) | No future consultation (n = 3508), n (%) | Future consultation (n = 350), n (%) | OR (95% CI) |
|---|---|---|---|---|
| Sex | | | | |
| Male | 1577 (40.9) | 1446 (41.2) | 131 (37.4) | 1.00 (referent) |
| Female | 2281 (59.1) | 2062 (58.8) | 219 (62.6) | 1.17 (0.94, 1.47) |
| Age group, years | | | | |
| 50–64 | 1631 (42.3) | 1489 (42.4) | 142 (40.6) | 1.00 (referent) |
| 65–74 | 1193 (30.9) | 1080 (30.8) | 113 (32.3) | 1.10 (0.84, 1.42) |
| ⩾75 | 1034 (26.8) | 939 (26.8) | 95 (27.1) | 1.06 (0.81, 1.39) |
| Further education | 401 (10.7) | 369 (10.8) | 32 (9.4) | 0.86 (0.59, 1.26) |
| General health | | | | |
| Obese | 862 (23.5) | 777 (23.3) | 85 (25.4) | 1.12 (0.86, 1.45) |
| Anxious[a] | 1843 (49.0) | 1673 (49.0) | 170 (49.4) | 1.02 (0.82, 1.27) |
| Depressed[b] | 1174 (31.2) | 1076 (31.5) | 98 (28.5) | 0.87 (0.68, 1.11) |
| Low SF-36 physical function[c] | 1225 (33.7) | 1112 (33.6) | 113 (34.8) | 1.05 (0.83, 1.34) |
| Pain | | | | |
| Foot pain | 3522 (91.3) | 3188 (90.5) | 334 (95.4) | 2.10 (1.25, 3.51)** |
| Low back pain | 1813 (47.0) | 1651 (47.1) | 162 (46.3) | 0.97 (0.78, 1.21) |
| Hip pain | 1781 (47.0) | 1624 (47.2) | 157 (45.6) | 0.94 (0.75, 1.18) |
| Knee pain | 2687 (70.3) | 2443 (70.2) | 244 (71.1) | 1.04 (0.82, 1.33) |
| Widespread pain | 722 (18.7) | 660 (18.8) | 62 (17.7) | 0.93 (0.70, 1.24) |
| Frequent consulter | 954 (24.7) | 833 (23.7) | 121 (34.6) | 1.70 (1.34, 2.14)* |

[a]HADS anxiety sub-scale score ⩾8. [b]HADS depression sub-scale score ⩾8. [c]Lowest tertile (sub-scale score ⩽25). *$P < 0.05$. **$P < 0.01$.

TABLE 3 Associations of future consultation for a musculoskeletal foot problem with illness perceptions

| Factor | All participants (n = 3858), n (%) | No future consultation (n = 3508), n (%) | Future consultation (n = 350), n (%) | OR (95% CI) |
|---|---|---|---|---|
| There is a lot that I can do to control my health | 3062 (80.5) | 2775 (80.3) | 287 (82.2) | 1.13 (0.85, 1.51) |
| What I do will affect whether my health gets better or worse | 2753 (75.6) | 2513 (76.0) | 240 (71.2) | 0.78 (0.61, 1.00) |
| Treatments are effective in controlling disease | 3261 (86.0) | 2948 (85.6) | 313 (89.9) | 1.50 (1.05, 2.16)* |
| My health is very unpredictable | 1789 (46.4) | 1618 (47.1) | 171 (49.6) | 1.11 (0.89, 1.38) |
| Illness makes me feel afraid | 1838 (47.6) | 1664 (48.4) | 174 (49.9) | 1.06 (0.85, 1.32) |
| The course of my life depends on me | 2654 (68.8) | 2417 (70.0) | 237 (68.3) | 0.92 (0.73, 1.17) |
| I have the power to influence my life | 2133 (56.1) | 1934 (56.0) | 199 (57.0) | 1.04 (0.83, 1.30) |
| OA is a serious condition | 3465 (89.8) | 3142 (91.2) | 323 (93.1) | 1.30 (0.84, 2.00) |
| Treatments are effective in controlling pain | 2676 (69.4) | 2424 (70.0) | 252 (72.8) | 1.15 (0.90, 1.47) |
| The thought of pain makes me afraid | 1273 (33.0) | 1138 (32.8) | 135 (38.6) | 1.28 (1.02, 1.61)* |

*$P < 0.05$.

consultation, nor were the predisposing factors of age, sex or education level. Similar findings were reported by Gorter *et al.* [31], who found that while age, sex, education and presence of comorbidities were not associated with primary-care consultation in older people with non-traumatic foot problems in The Netherlands, those who consulted were significantly more likely to report foot pain.

It is worth noting that the case definition used in this study combined participants who reported foot problems and those who reported foot pain in the past year. Population-based studies indicate that although there is a substantial degree of overlap between these categories, there are nevertheless some older people who report problems with their feet in the absence of pain [4, 15]. In the current study, 336 people (9.5% of the sample)

TABLE 4 Associations with future consultation for a musculoskeletal foot problem—final model

| Factor | B | S.E. | Wald | df | *P*-value | OR (95% CI) |
|---|---|---|---|---|---|---|
| Foot pain | 0.71 | 0.26 | 7.35 | 1 | 0.007 | 2.04 (1.22, 3.42) |
| Frequent consulter | 0.5 | 0.12 | 17.26 | 1 | <0.001 | 1.65 (1.30, 2.09) |
| Treatments are effective in controlling disease | 0.43 | 0.19 | 5.39 | 1 | 0.02 | 1.54 (1.07, 2.21) |
| The thought of pain makes me afraid | 0.22 | 0.12 | 3.51 | 1 | 0.061 | 1.25 (0.99, 1.57) |
| Constant | −3.56 | 0.31 | 129.58 | | <0.001 | 0.03 |

reported foot problems but no foot pain. Similar observations have been made in relation to the hand, where the prevalence of hand problems (such as difficulty opening jars and concern about aesthetics) is higher than the prevalence of hand pain [37]. Two frequently reported foot problems in older people—difficulty finding comfortable shoes and difficulty managing basic foot hygiene [4, 38]—are unlikely to be triggers for a GP consultation, so it is perhaps to be expected that the presence of foot symptoms was the strongest predictor of future consultation.

Frequent consultation for other problems in the 18 months before the survey was also significantly associated with future consultation for a musculoskeletal foot problem. This observation is consistent with previous studies of primary-care consultations in general [39], and of knee pain specifically [10]. Several studies have shown that people who consult their GP on a frequent basis are more likely to be older, female, to have a low income and multiple comorbidities [40]. However, it would appear that frequent consultation is not restricted to particular categories of morbidity [41], suggesting that there is a generic set of characteristics that drive frequent consultation irrespective of the specific symptoms an individual has. Our findings add another condition—musculoskeletal foot problems—to the growing list for which being a frequent consulter influences the decision to seek GP care.

Although we have identified significant independent predictors of consultation for musculoskeletal foot problems in this study, both the number of significant predictors and the strength of the observed associations were rather modest. This could indicate that either our set of predictor variables was inadequate, or that predicting future consultation is inherently difficult. We acknowledge that the addition of other variables, such as a broader array of psychological assessments and more detailed information regarding participants' foot problems, may have improved our model. However, several previous studies have reported similar difficulty in accurately predicting patterns of consultation [10, 12, 42] and it has been shown that previous patterns of consultation are better predictors of future consultation than measures of health status [39].

The findings of this study need to be considered in the context of several inherent limitations. First, although the questions in the population survey focused on arthritis, it is possible that some participants reporting foot problems or foot pain had non-musculoskeletal foot conditions (such as nail disorders, fungal infections, corns and calluses) [43]. Because we specifically linked the survey data to musculoskeletal, injury and symptom-related Read terms in the consultation database, the rate of consultation reported here is likely to be an underestimate, as consultations for non-musculoskeletal foot problems may have been documented under other chapters. However, given that the most commonly documented Read terms in the database were symptoms rather than diagnostic codes (i.e. foot pain and ankle pain), some proportion of non-musculoskeletal conditions would have been picked up. Secondly, morbidity coding in GP databases frequently lacks specificity, so specific conditions such as plantar fasciitis may have been documented using a vague symptom code such as foot pain. Because of this limitation, it was not possible to explore consultation behaviour for individual foot conditions, although it is likely that the factors influencing the decision to consult may vary depending on the type of foot problem an individual has.

Despite these limitations, the findings of this study indicate that only a small proportion of older people with foot problems consult their GP about them, and that consultation is moderately influenced by foot pain, frequent consultation for other problems and positive perceptions of treatment efficacy. Future studies will need to explore the relative contribution of medical and non-medical health professionals in managing foot problems, the factors that influence an older person's selection of health-care provider, and whether foot problems are being adequately managed in this age group.

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**Rheumatology key messages**

- Few older people with a musculoskeletal foot problem consulted their GP about it.
- Sex, age, education and general health did not influence future consultation.
- Foot pain, frequent consultation for other problems and positive perceptions of treatment efficacy influenced future consultation.

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## References

1 Chen J, Devine A, Dick IM, Dhaliwal SS, Prince RL. Prevalence of lower extremity pain and its association with functionality and quality of life in elderly women in Australia. J Rheumatol 2003;30:2689–93.

2 Thomas E, Peat G, Harris L, Wilkie R, Croft PR. The prevalence of pain and pain interference in a general population of older adults: cross-sectional findings from the North Staffordshire Osteoarthritis Project (NorStOP). Pain 2004;110:361–8.

3 Keenan AM, Tennant A, Fear J, Emery P, Conaghan PG. Impact of multiple joint problems on daily living tasks in people in the community over age fifty-five. Arthritis Rheum 2006;55:757–64.

4 Benvenuti F, Ferrucci L, Guralnik JM, Gangemi S, Baroni A. Foot pain and disability in older persons: an epidemiologic survey. J Am Geriatr Soc 1995;43:479–84.

5 Dunn JE, Link CL, Felson DT, Crincoli MG, Keysor JJ, McKinlay JB. Prevalence of foot and ankle conditions in a multiethnic community sample of older adults. Am J Epidemiol 2004;159:491–8.

6 Jones CL. Who treats feet? J Am Podiatr Med Assoc 1995;85:293–4.

7 Menz HB, Jordan KP, Roddy E, Croft PR. Characteristics of primary care consultations for musculoskeletal foot and ankle problems in the UK. Rheumatology. Advance Access published April 19 2010.

8 Waxman R, Tennant A, Helliwell P. Community survey of factors associated with consultation for low back pain. Br Med J 1998;317:1564–7.

9 Mortimer M, Ahlberg G, MUSIC-Norrtalje Study Group. To seek or not to seek? Care-seeking behaviour among people with low back pain. Scan J Public Health 2003;31: 194–203.

10 Jordan K, Jinks C, Croft P. A prospective study of the consulting behaviour of older people with knee pain. Br J Gen Pract 2006;56:269–76.

11 Mitchell HL, Carr AJ, Scott DL. The management of knee pain in primary care: factors associated with consulting the GP and referrals to secondary care. Rheumatology 2006;45:771–6.

12 Bedson J, Mottram S, Thomas E, Peat G. Knee pain and osteoarthritis in the general population: what influences patients to consult? Fam Pract 2007;24:443–53.

13 Andersen R, Newman JF. Societal and individual determinants of medical care utilization in the United States. Milbank Mem Fund Q Health Soc 1973;51:95–124.

14 Menz HB, Morris ME, Lord SR. Foot and ankle characteristics associated with impaired balance and functional ability in older people. J Gerontol A Biol Sci Med Sci 2005; 60A:1546–52.

15 Leveille SG, Guralnik JM, Ferrucci L, Hirsch R, Simonsick E, Hochberg MC. Foot pain and disability in older women. Am J Epidemiol 1998;148:657–65.

16 Menz HB, Morris ME, Lord SR. Foot and ankle risk factors for falls in older people: a prospective study. J Gerontol A Biol Sci Med Sci 2006;61A:M866–70.

17 Williamson J, Stokoe I, Gray S. Old people at home - their unreported needs. Lancet 1964;i:1117–20.

18 Munro BJ, Steele JR, Foot-care awareness. A survey of persons aged 65 years and older. J Am Podiatr Med Assoc 1998;88:242–8.

19 Thomas E, Wilkie R, Peat G, Hill S, Dziedzic K, Croft P. The North Staffordshire Osteoarthritis Project - NorStOP: prospective, 3-year study of the epidemiology and management of clinical osteoarthritis in a general population of older adults. BMC Musculoskelet Disord 2004;5:2.

20 Peat G, Thomas E, Handy J *et al*. The Knee Clinical Assessment Study-CAS(K). A prospective study of knee pain and knee osteoarthritis in the general population. BMC Musculoskelet Disord 2004;5:4.

21 Jordan K, Porcheret M, Kadam UT, Croft P. The use of general practice consultation databases in rheumatology research. Rheumatology 2006;45:126–8.

22 Peat G, Thomas E, Handy J *et al*. The Knee Clinical Assessment Study-CAS(K). A prospective study of knee pain and knee osteoarthritis in the general population: baseline recruitment and retention at 18 months. BMC Musculoskelet Disord 2006;7:30.

23 Ware JE, Snow KK, Kosinski M, Gandek B. SF-36 Health Survey Manual and Interpretation Guide. New England Medical Centre, The Health Institute: Boston MA, 1993.

24 MacFarlane GJ, Croft PR, Schollum J, Silman AJ. Widespread pain: is an improved classification possible? J Rheumatol 1996;23:1628–32.

25 Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. Acta Psych Scand 1983;67:361–70.

26 Moss-Morris R, Weinman J, Petrie KJ, Horne R, Cameron LD, Buick D. The revised Illness Perception Questionnaire (IPQ-R). Psychol Health 2002; 17:1–16.

27 Porcheret M, Hughes R, Evans D *et al*. North Staffordshire General Practice Research Network. Data quality of general practice electronic health records: the impact of a program of assessments, feedback, and training. J Am Med Inform Assoc 2004;11:78–86.

28 NHS Information Authority. The Clinical Terms version 3 (The Read Codes). NHS Information Authority: Birmingham, 2000.

29 Jordan K, Clarke AM, Symmons DPM *et al*. Measuring disease prevalence: a comparison of musculoskeletal disease using four general practice consultation databases. Br J Gen Pract 2007;57:7–14.

30 Jordan KP, Kadam UT, Hayward R, Porcheret M, Young C, Croft P. Annual consultation prevalence of regional musculoskeletal problems in primary care. BMC Musculoskelet Disord 2010 (in press).

31 Gorter K, Kuyvenhoven M, deMelker R. Health care utilisation by older people with non-traumatic foot

complaints. What makes the difference? Scand J Prim Health Care 2001;19:191–3.

32 Haetzman M, Elliott AM, Smith BH, Hannaford P, Chambers WA. Chronic pain and the use of conventional and alternative therapy. Fam Pract 2003;20:147–54.

33 Garrow AP, Silman AJ, Macfarlane GJ. The Cheshire foot pain and disability survey: a population survey assessing prevalence and associations. Pain 2004;110:378–84.

34 Harvey I, Frankel S, Marks R, Shalom D, Morgan M. Foot morbidity and exposure to chiropody: population based study. Br Med J 1997;315:1054–5.

35 Gorter K, dePoel S, deMelker R, Kuyvenhoven M. Variation in the diagnosis and management of common foot problems by GPs. Fam Pract 2001;18:569–73.

36 McCarthy EM, Sheane BJ, Cunnane G. Greater focus on clinical rheumatology is required for training in internal medicine. Clin Rheumatol 2009;28:139–43.

37 Dziedzic K, Thomas E, Hill S, Wilkie R, Peat G, Croft PR. The impact of musculoskeletal hand problems in older adults: findings from the North Staffordshire Osteoarthritis Project (NorStOP). Rheumatology 2007;46:963–7.

38 Cartwright A, Henderson G. More trouble with feet - a survey of the foot problems and chiropody needs of the elderly. Department of Health and Social Security, HMSO: London, 1986.

39 Jordan K, Ong BN, Croft P. Previous consultation and self reported health status as predictors of future demand for primary care. J Epidemiol Community Health 2003;57: 109–13.

40 Gill D, Sharpe M. Frequent consulters in general practice: a systematic review of studies of prevalence, associations and outcome. J Psychosomat Res 1999;47:115–30.

41 Foster A, Jordan K, Croft P. Is frequent attendance in primary care disease-specific? Fam Pract 2006;23: 444–52.

42 Kapur N, Hunt I, Lunt M, McBeth J, Creed F, Macfarlane G. Psychosocial and illness related predictors of consultation rates in primary care - a cohort study. Psychol Med 2004;34:719–28.

43 Burzykowski T, Molenberghs G, Abeck D *et al*. High prevalence of foot diseases in Europe: results of the Achilles Project. Mycoses 2003;46:496–505.