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Incidence, prevalence, and consultation rates of shoulder complaints in general practice

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Objective: To study the incidence, prevalence, and consultation rates of patients with shoulder complaints in general practice in the Netherlands during 10 years following initial presentation.

Methods: A primary care database with an average population of 30 000 patients per year aged 18 years or older was used to select patients who consulted their general practitioner (GP) with shoulder complaints in the northern part of the Netherlands in the year 1998. Information about consultations for shoulder complaints was extracted. Incidence and prevalence for men, women, and different age groups were calculated for 9 and 10 years.

Results: A total of 526 patients consulted their GP with a new shoulder complaint. During an average follow-up of 7.6 years, these patients consulted their GP 1331 times because of their shoulder complaints (average of 0.33 consultations per year). Almost half of the patients consulted their GP only once. Patients in the 45–64 age category had the highest probability of repeated GP consultations during follow-up. Average incidence was 29.3 per 1000 person-years. Women and patients in the 45–64 age category have the highest incidence. The annual prevalence of shoulder complaints ranged from 41.2 to 48.4 per 1000 person-years, calculated for the period 1998 to 2007, and was higher among women than among men.

Conclusion: Although the incidence of shoulder complaints in general practice is as high as 29.3 per 1000 person-years, GPs' workload is generally low, as nearly half of these patients consult their GP only once for their complaint.

Musculoskeletal symptoms are common among the adult population, yet only 33–45% of such patients consult their general practitioner (GP) for their complaints (1, 2). One quarter of the population consult their GP at least once a year for a musculoskeletal problem. These complaints represent 9.3–18% of all primary care GP consultations (3–6). Shoulder complaints constitute the third most common musculoskeletal presentation (7, 8). Publications of incidence and prevalence rates of shoulder problems in general practice are scarce and mainly concern the Netherlands and the UK. Incidence rates range from 11.2 to 29.5 per 1000 person-years (9–12), and the reported prevalence rates range from 4.7 to 46.7 per 1000 person-years (1, 11, 13). As described in various studies, shoulder complaints often have a long course with recurrences, which contribute to the high prevalence (14–16).

Most published studies describing the clinical course of shoulder complaints have a prospective (observational)

design (15, 16). In these studies, patients with a new shoulder complaint are assessed periodically for their level of pain and/or disability. However, their consultation rates are rarely investigated. Only Linsell et al report the period of consultation after initial presentation, but not the consultation rates during that period (11). This study has the longest reported follow-up, which is limited to 3 years. Bot et al present the number of consultations for new episodes of shoulder symptoms per 1000 registered persons in general practice (9). So far it is unclear how consultations are distributed over the follow-up years after initial presentation.

The first aim of this study was to establish the rate of consultation of a GP in a cohort of patients with new shoulder complaints, grouped by gender and age categories over a 10-year period. The second aim was to estimate the incidence and prevalence of shoulder complaints.

Material and methods

Design and setting

The current study was designed as a retrospective longitudinal cohort study. To select patients with shoulder complaints, data from the morbidity and medication Registration Network Groningen (RNG) were used

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(17, 18). The database of the RNG was established in 1989 and contains anonymized medical information from the patient population of about 20 GPs in the northern part of the Netherlands, divided over three group practices in three towns. Data such as gender, date of birth, and consultation dates were extracted from this database. Data were used from the 10-year period 1998–2007, which is referred to here as the follow-up period. The yearly average population was about 30 000 patients (all ages). GPs recorded all consultations in electronic medical records.

Symptoms, complaints, and diagnoses were classified according to the International Classification of Primary Care (ICPC), developed by the World Organization of Family Doctors (19). The ICPC codes are based on a biaxial structure (a letter followed by a number). Letters stand for body systems (e.g. L is musculoskeletal system) and the two-digit numeric code represents symptoms, complaints, or diagnoses. The codes L08 and L92 are used for shoulder symptoms and syndromes, respectively.

Patient selection

All patients classified by the codes L08 and L92 in the year 1998 were extracted from the RNG database and were included in this study. Patients under the age of 18 on 1 January 1998 and patients who had a history of shoulder complaints were excluded.

Consultations

To calculate the consultation rate during follow-up, the electronic medical records of selected patients were examined. Information such as side of the affected shoulder was retrieved. Consultations were defined as every GP face-to-face contact.

Incidence

Incident cases were defined as patients with a new shoulder complaint who did not consult their GP for their shoulder in the preceding year. By using 1998 as the control year, 9 years were left for incidence rate calculations. A patient could be an incident case only once during those 9 years of follow-up. Incidence was calculated per 1000 person-years for every year, grouped by age and gender, starting in the year 1999.

Prevalence

All new and current cases of patients with shoulder complaints were used to calculate the annual prevalence rate. Patients were only counted once as a prevalent case every year. Annual prevalence was calculated per 1000 person-years for every year, grouped by age and gender.

Procedures

The RNG database provides information about the date of entering and the date and reason for leaving a general practice (e.g. moving, death, etc.). The number of days patients were registered at the GP is called person-days and can be converted to person-years. Person-years were used to correct for an incomplete follow-up in further calculations. The following subgroups were defined for data presentation: men and women, and three age groups: 18–44, 45–64 and 65+ years. Age on 1 January 1998 was used to assign patients to their age category. Patients did not switch between subgroups during follow-up.

Statistics

Kaplan–Meier analyses were used to estimate the probability of patients consulting their GP for shoulder complaints during the 10 years of follow-up. The RNG database did not provide information about recovery, therefore the assumption was made that a patient has recovered when he/she did not visit the GP within a year beyond the last consultation and thereafter.

Sensitivity analyses using an interval of 2 and 3 years were also performed. The results are described in the next section. Those patients with no consultations within the year following the last GP visit (observation interval) in the 1998–2007 period leave the ‘survival’ curve. Patients who left the GP practice within the year following the last consultation and those who left the RNG database before the end of the observation period (due to e.g. moving, death) are defined as censored patients. Patients stayed in the analyses if they had a period of more than 1 year between two contacts. A log-rank test was used to compare differences in Kaplan–Meier curves for the gender and age categories.

An independent-samples t-test was used to compare differences in mean consultation rates per year between age and gender. The Pearson χ^2 test was used ($p \leq 0.05$) for comparisons in incidence and prevalence. Analyses were performed with Microsoft Access 2003 and SPSS for Windows, version 16.0 (SPSS Inc., Chicago, IL, USA).

Results

Patient selection

A total of 905 patients aged ≥ 18 years were selected from the RNG database. After exploring the electronic medical records, six patients appeared not to have shoulder complaints and 373 patients had a history of shoulder complaints. Completing the search in the electronic medical records resulted in 526 patients with a new shoulder complaint. Their mean age at presentation was 47.2 (sd 17.4) years, and 64.8% were women. By the end of the 10 years of follow-up, 199 patients had left the general practice (Figure 1). Their average follow-up was 4.3 (sd 2.6) years.

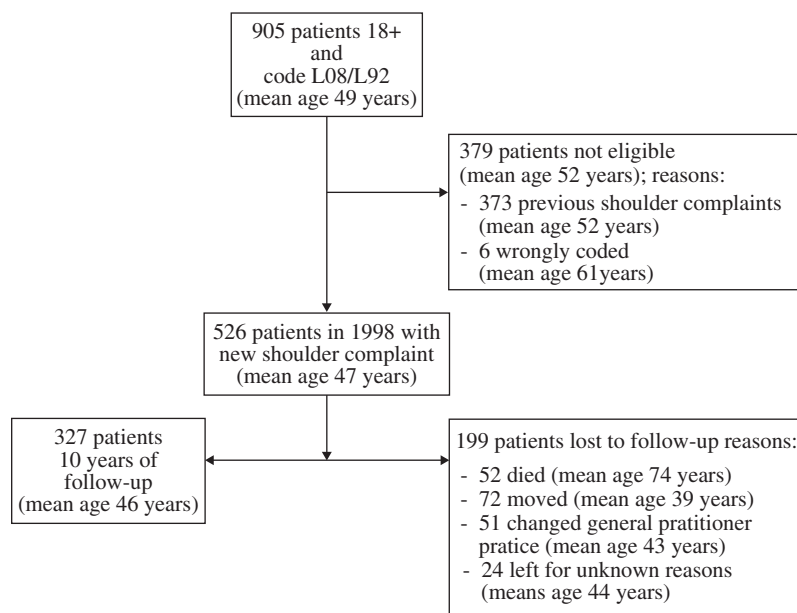


Figure 1. Patient selection.

Consultations

After 10 years of follow-up the cohort had consulted their GP 1331 times for shoulder complaints. The average follow-up of the cohort was 7.6 (sd 3.0) years. Corrected for person-years, the patients had an average of 0.33 consultations per year (men 0.36; women 0.32). The average number of consultations per year of patients aged 18–44 was 0.30, for the 45–64 and 65+ age groups 0.36. Almost half of the patients (251 out of 526) had consulted their GP only once because of shoulder complaints during the 10 years of follow-up, and 79.3% less than four times. The maximum number of consultations by a patient in the first year was 14. Three-hundred and ninety-one patients (74.3%) consulted their GP only during the first year following initial presentation (965 consultations). Four-hundred and fifteen patients (78.9%) had all their consultations within the first 2 years (1045 consultations). Twenty-one patients (4.0%) consulted their GP more than seven times during the total follow-up, with a maximum of 25 consultations.

Incidence

Figure 2 presents the incidence of patients with shoulder complaints. The average incidence was 29.3 [95% confidence interval (CI) 28.48–30.04] per 1000 person-years over a period of 9 years, with specific incidences of 32.2 (95% CI 31.10–33.40) for women and 26.2 (95% CI 25.11–27.21) for men (Figure 2A). The mean incidence of shoulder patients per 1000 person-years was 22.2 (95% CI 21.32–23.10) in the 18–44 age category and 37.1 (95% CI 34.67–39.47) in the 65+ age category, with the highest incidence being 40.2 (95% CI 38.50–41.95) patients for the 45–64 age category (Figure 2B).

Prevalence

The annual prevalence of shoulder complaints ranged from 41.2 to 48.4 per 1000 person-years, calculated for the period 1998 to 2007, and was higher among women than men, ranging respectively from 46.2 to 56.3 (95% CI

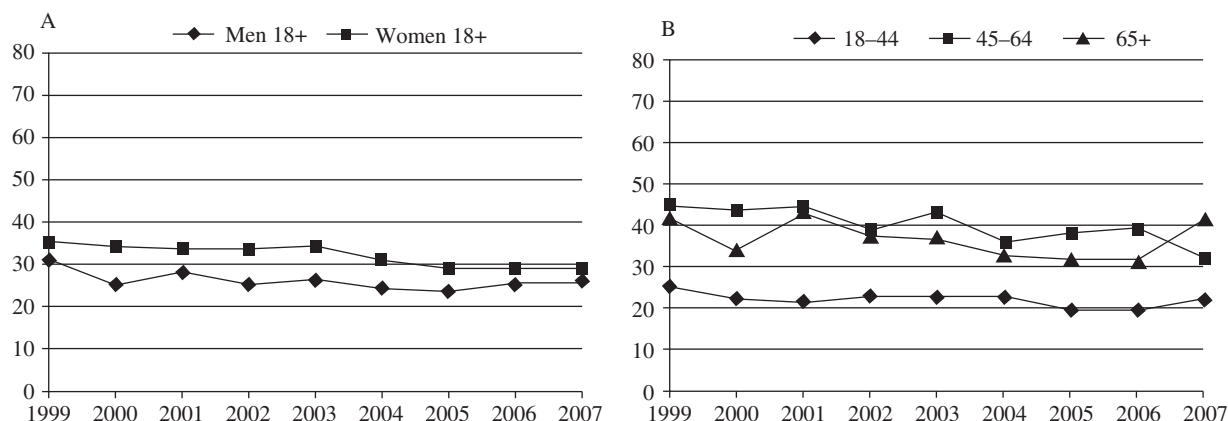


Figure 2. Incidence per year according to (A) gender and (B) age category.

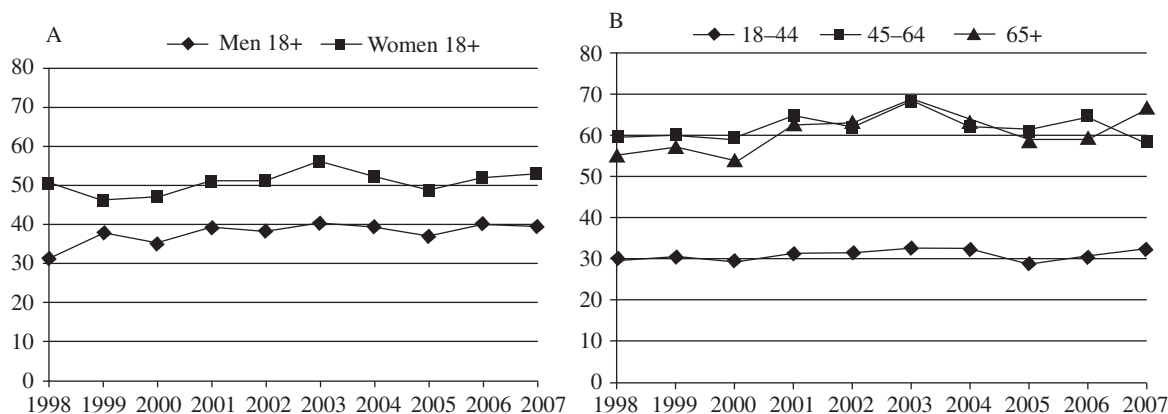


Figure 3. Prevalence from 1998 to 2007 according to (A) gender and (B) age category.

from 42.3–50.0 to 52.1–60.5) and from 31.2 to 40.2 (95% CI from 27.8–34.5 to 36.5–43.8) in the period 1998–2007 (Figure 3A). In the 18–44 age category the annual prevalence ranged from 28.8 to 32.8 (95% CI from 25.9–31.7 to 29.7–35.9), in the 45–64 age category from 58.6 to 68.5 (95% CI from 53.2–64.0 to 62.4–74.6), and in the 65+ age category from 53.9 to 68.7 (95% CI from 46.0–61.9 to 59.8–77.6) (Figure 3B).

Consultation rate probability

After 10 years of follow-up, 199 (37.8%) persons had left the RNG database. Figures 4 and 5 show the Kaplan–Meier curves that estimate the probability of patients consulting their GP because of shoulder complaints during follow-up, divided by gender and age category, respectively. The curve is horizontal in the first year, caused by the assumption that a patient had recovered when they did not visit the GP within a year beyond the last consultation. The log-rank test was not significant for differences between men and women. There is a significant difference between the 45–64 and the 65+ age groups ($p = 0.039$). The elderly have a shorter survival, which means that, although they have higher incidence and prevalence

figures than the youngest group, they have a lower probability for repeated consultation in the course of time.

The sensitivity analyses, using a longer interval of 2 and 3 years, only resulted in differences in the Kaplan–Meier curves concerning the length of the horizontal line and the time of censoring. There were no other differences between the curves.

Discussion

Summary of main findings

This retrospective cohort study identified 526 incident cases with shoulder complaints. During the 10 years of follow-up they had an average GP consultation rate of 0.33 per year. The most important result of this study was that almost half of these patients consulted their GP only once.

In our results, both incidence and prevalence were higher in women. Patients in the 18–44 age category had a significantly lower incidence and prevalence than patients over 45 years of age. Of note, pensioners (age > 65 years) had a high incidence but a very low probability for repeated consultation in the course of time.

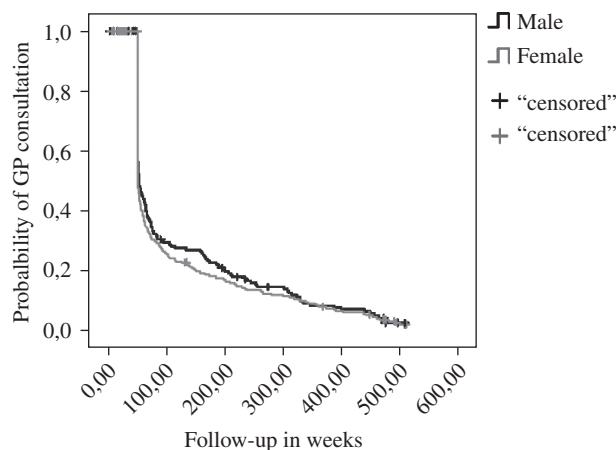


Figure 4. Probability of GP consultation during 10 years of follow-up according to gender.

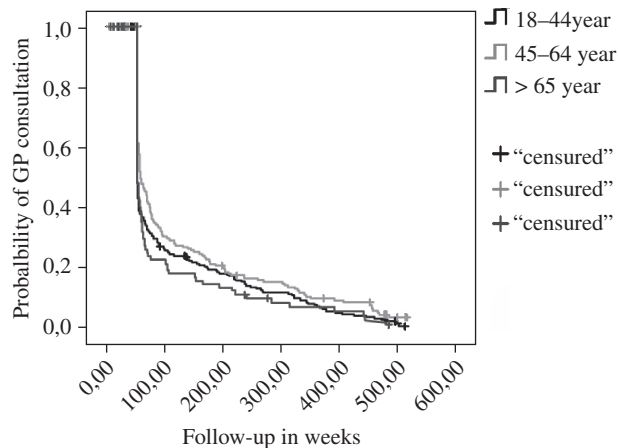


Figure 5. Probability of GP consultation during 10 years of follow-up according to age category.

Strengths and limitations of the study

A major strength of our study is that it not only provides information about consultation rates and distribution during follow-up but also has a long average follow-up period of 7.6 years after initial presentation. Most previously published studies on incidence, prevalence, and consultation rates of patients with shoulder complaints have a cross-sectional or longitudinal design with a limited follow-up period (9–11, 13) and do not investigate the number of GP consultations during follow-up. By using data from the RNG database, a reliable registration of actual consultation rates, incidence, and prevalence could be made without the influence of prospective study protocols. However, this method has some limitations. First, the quality of registration by the GPs is very important for the reliability of the database. For the incident cases in 1998 and the consultation rates, this was addressed by checking data in electronic medical records. Six incorrectly coded patients who did not suffer from shoulder complaints were excluded. On the contrary, patients may have remained undetected in our study when GPs did not use the right ICPC code for a shoulder patient. The chances of this happening were minimized by training sessions for GPs and their assistants, organized two to three times a year, during which patient cases were used to train encoding correctly.

The RNG is a dynamic database. Patients enter and leave at any time. Almost 40% of patients left the database before the end of follow-up, although the average follow-up was still a considerable 7.6 years. Furthermore, the RNG database gives no information about recovery. There is no information if, for example, a second consultation takes place because of a relapse after recovery or if this concerns a persisting shoulder complaint.

There are some differences when comparing demographic characteristics of the cohort of patients with a new shoulder complaint in 1998 with our reported incidence rates divided by gender and age. The proportion of women in the cohort is higher than the men/women ratio for incidence rates. Incidence decreased inversely with regard to increasing age categories in the cohort, except for the 45–64 age group compared to the 18–44 age group. This can be explained by the symptom-free period, which was 1 year for incidence calculations and the entire medical history for the cohort.

Unfortunately, further analysis of associations between diagnosis and consultation was not possible because of the limited recorded diagnoses. According to the Dutch College of General Practitioners, a specific diagnosis is not necessary for the treatment of patients suffering from shoulder complaints. This is probably an explanation for the limited recorded diagnoses. In addition, there is considerable doubt about diagnosing shoulder complaints in general practice because of inter-observer variation in physical examination and diagnostic interpretation (20–22).

Comparison with existing literature

The incidence of shoulder complaints in general practice in our study is the same as that published by Feleus et al, who reported an incidence of 29.5 per 1000 person-years (10). However, they only included patients aged 18 to 64. Van der Windt et al (12), Linsell et al (11) and Bot et al (9) found lower incidence rates, respectively 11.2, 14.7, and 23.1 per 1000 patient-years. The lower incidence reported by Bot et al. (9) can be explained by the fact that they did not use age restrictions. Van der Windt et al (12) used a prospective study design that might have influenced the incidence rate. The difference with Linsell et al (11) might be explained by the symptom-free period, which was 3 years for their study and 1 year in ours. Incident cases in the first years (e.g. 1999 and 2000) of our study may therefore include more recurrent cases. The highest incidence rate was also found for the year 1999. Differences in health-care systems between the UK and the Netherlands might be another explanation, with GPs being more easily accessible for patients in the Netherlands.

In our study the incidence of shoulder complaints among women was higher than among men. This is in accordance with the studies of Bot et al (9), Feleus et al (10) and Van der Windt et al (12). Linsell et al did not find this difference (11). Bot et al identified the highest incidence in the 40–60 age group, which is similar to our study (9).

The annual prevalence of patients with shoulder complaints in general practice in our study ranged from 41.2 to 48.4 per 1000 person-years, higher than that reported by Linsell et al at 23.6 per 1000 person-years (11). As in most musculoskeletal disorders, the prevalence of shoulder complaints is higher among women than men, as described in the studies of Picavet and Schouten (1) and Linsell et al (11) and in the review by Luime et al (13), which is in accordance with our study. Differences between the sexes might be explained by a higher exposure to risk factors for musculoskeletal pain in women (awkward and static postures during repetitive daily activities, e.g. household tasks), women's lower threshold to use health-care services, a different pain sensitivity, and differences in biological, social and psychological factors (1, 3, 5, 7, 23).

Linsell et al described a prevalence rate that increased with age (11). We only found a difference between the youngest and the two older categories. In the study of Linsell et al, 52.1% of patients visited their GP only once for their shoulder complaint, which is similar to our study (11). In contrast to our study, Linsell et al reported that patients aged 60 or older consulted their GP for a longer period of time than younger patients. A possible explanation for our findings might be that degenerative changes in the rotator cuff are more prevalent in persons older than 65, because of their age. This makes them more vulnerable to shoulder complaints due to normal daily activities that involve the shoulder. The elderly might be more acceptant of their complaints and are less active in the

labour process. This could account for the very low probability for repeated consultation in the course of time, despite high incidence rates.

In this article we do not report on the treatment of patients with shoulder complaints. Dorrestijn et al, however, used the same primary care database to investigate medical treatment of shoulder complaints (18). They found that 50% of the initial treatments at first consultation involved an oral non-steroidal anti-inflammatory drug (NSAID) prescription, 32% a wait-and-see policy, 15% a referral for physiotherapy, and 3% a corticosteroid injection. During the 10-year follow-up, a wait-and-see policy or a prescription for NSAIDs sufficed for eight out of 10 patients. Nearly half of the patients with a new shoulder complaint consulted their GP only once. Although the incidence of shoulder complaints in general practice is fairly high, the workload for GPs seems low.

Implications for clinical practice

Shoulder pain is often described as an important medical problem and a major reason for seeking medical advice and intervention. We found that patients with shoulder complaints consulted their GP at a rapidly decreasing rate during follow-up. Most of the consultations were during the first 2 years following initial presentation. An incidence rate of almost 30 per 1000 person-years seems high, but the workload for GPs proved to be small because nearly half of the patients consulted their GP only once for their complaint. It seems that many shoulder complaints often have a favourable course.

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References

1. Picavet HS, Schouten JS. Musculoskeletal pain in the Netherlands: prevalences, consequences and risk groups, the DMC(3)-study. *Pain* 2003;102:167–78.
2. Hagen KB, Bjorndal A, Uhlig T, Kvien TK. A population study of factors associated with general practitioner consultation for non-inflammatory musculoskeletal pain. *Ann Rheum Dis* 2000;59: 788–93.
3. Jordan KP, Kadam UT, Hayward R, Porcheret M, Young C, Croft P. Annual consultation prevalence of regional musculoskeletal problems in primary care: an observational study. *BMC Musculoskelet Disord* 2010;11:144.
4. McCormick A, Charlton J, Fleming D. Assessing health needs in primary care. Morbidity study from general practice provides another source of information. *BMJ* 1995;310:1534.
5. Njalsson T, Sigurdsson JA, McAuley RG. Health problems in family practice. An Icelandic multicentre study. *Scand J Prim Health Care* 1996;14:4–12.

6. Rekola KE, Keinanen-Kiukaanniemi S, Takala J. Use of primary health services in sparsely populated country districts by patients with musculoskeletal symptoms: consultations with a physician. *J Epidemiol Community Health* 1993;47:153–7.
7. Urwin M, Symmons D, Allison T, Brammah T, Busby H, Roxby M, et al. Estimating the burden of musculoskeletal disorders in the community: the comparative prevalence of symptoms at different anatomical sites, and the relation to social deprivation. *Ann Rheum Dis* 1998;57:649–55.
8. Adamson J, Ebrahim S, Dieppe P, Hunt K. Prevalence and risk factors for joint pain among men and women in the West of Scotland Twenty-07 study. *Ann Rheum Dis* 2006;65:520–4.
9. Bot SD, van der Waal JM, Terwee CB, Van der Windt DA, Schellevis FG, Bouter LM, et al. Incidence and prevalence of complaints of the neck and upper extremity in general practice. *Ann Rheum Dis* 2005;64:118–23.
10. Feleus A, Bierma-Zeinstra SM, Miedema HS, Bernsen RM, Verhaar JA, Koes BW. Incidence of non-traumatic complaints of arm, neck and shoulder in general practice. *Man Ther* 2008;13: 426–33.
11. Linsell L, Dawson J, Zondervan K, Rose P, Randall T, Fitzpatrick R, et al. Prevalence and incidence of adults consulting for shoulder conditions in UK primary care; patterns of diagnosis and referral. *Rheumatology (Oxford)* 2006;45:215–21.
12. van der Windt DA, Koes BW, De Jong BA, Bouter LM. Shoulder disorders in general practice: incidence, patient characteristics, and management. *Ann Rheum Dis* 1995;54:959–64.
13. Luime JJ, Koes BW, Hendriksen IJ, Burdorf A, Verhagen AP, Miedema HS, et al. Prevalence and incidence of shoulder pain in the general population; a systematic review. *Scand J Rheumatol* 2004;33:73–81.
14. Croft P, Pope D, Silman A. The clinical course of shoulder pain: prospective cohort study in primary care. Primary Care Rheumatology Society Shoulder Study Group. *BMJ* 1996;313:601–2.
15. Reilingh ML, Kuijpers T, Tanja-Harfterkamp AM, van der Windt DA. Course and prognosis of shoulder symptoms in general practice. *Rheumatology (Oxford)* 2008;47:724–30.
16. Winters JC, Sobel JS, Groenier KH, Arendzen JH, Meyboom-de Jong B. The long-term course of shoulder complaints: a prospective study in general practice. *Rheumatology (Oxford)* 1999;38:160–3.
17. van der Veen WJ, Meyboom-de Jong B. Age and Gender. In: Jones R, Britten N, Culpepper L, Gass DA, Grol R, Mant D, Silagy C, editors. *Oxford textbook of primary medical care*. Oxford: Oxford University Press, 2004:1–9.
18. Dorrestijn O, Greving K, van der Veen WJ, van der Meer K, Diercks RL, Winters JC, et al. Patients with shoulder complaints in general practice: consumption of medical care. *Rheumatology (Oxford)* 2011;50:389–95.
19. Lamberts H, Wood M. *International classification of primary care*. Oxford: Oxford University Press, 1987.
20. de Winter AF, Jans MP, Scholten RJ, Deville W, van Schaardenburg D, Bouter LM. Diagnostic classification of shoulder disorders: interobserver agreement and determinants of disagreement. *Ann Rheum Dis* 1999;58:272–7.
21. Schellingerhout JM, Verhagen AP, Thomas S, Koes BW. Lack of uniformity in diagnostic labeling of shoulder pain: time for a different approach. *Man Ther* 2008;13:478–83.
22. Winters JC, Jongh de AC, van der Windt DAWM, Jonquière M, de Winter AF, van der Heijden GJMG, et al. Schouderklachten. [NHG Standard M08 National Guidelines for Shoulder Complaints of the Dutch College for General Practitioners], in Dutch. *Huisarts Wet* 1999;42:222–31.
23. Wijnhoven HA, de Vet HC, Picavet HS. Prevalence of musculoskeletal disorders is systematically higher in women than in men. *Clin J Pain* 2006;22:717–24.