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SPECIAL REPORT

Epidemiology of chronic pain and its treatment in the Netherlands

G.E. Bekkering[1*], M.M. Bala[2], K. Reid[3], E. Kellen[4], J. Harker[5], R. Riemsma[5], F.J.P.M. Huygen[6], J. Kleijnen[5,7]

[1]BeSyRe Bekkering Systematic Reviews, Geel, Belgium, Center for Evidence Based Medicine, Katholieke Universiteit Leuven, Leuven, Belgium, [2]Second Department of Internal Medicine, Clinical Decision Unit, Jagiellonian University Medical College, Krakow, Poland, [3]KJ Research, Rosemere, Canada, [4]Leuven Centre for Cancer Prevention, University Hospitals, Campus St Rafael, Leuven, Belgium, [5]Kleijnen Systematic Reviews Ltd, York, United Kingdom, [6]Erasmus Medical Centre, Rotterdam, the Netherlands, [7]School for Public Health and Primary Care (CAPHRI), University of Maastricht, Maastricht, the Netherlands, *corresponding author: tel.: +32 (0)16-33 26 88, fax: +32 (0)16-33 74 80, e-mail: Trudy.Bekkering@med.kuleuven.be

ABSTRACT

Background: Chronic pain is common; however, good epidemiological data are scarce. Such information can help all the involved stakeholders to make responsible decisions about health budgets and prioritisation. This study aims to provide best-evidence epidemiological information about chronic pain in the Netherlands.

Methods: We performed a systematic search which yielded 16,619 references, 119 Dutch studies were relevant. We selected at least three studies per question that provided the most recent, representative and valid data.

Results: The prevalence of moderate to severe general chronic pain among Dutch adults was estimated at 18%. This prevalence was 27% and 55% for any cancer pain. Up to 74% of patients with general or non-cancer chronic pain get treated; this percentage is little higher for patients with cancer pain. A substantial proportion of the patients receive drug treatment for their pain, mainly NSAIDs, but also non-pharmacological interventions for pain are being used. Up to 43% of the chronic non-cancer pain patients report not receiving treatment and up to 79% of the patients believe their pain is inadequately treated. All studies reported a detrimental effect of chronic pain on quality of life, activities of daily living and mental health. Chronic pain is also associated with direct and indirect medical costs, and patients may have decreased income and additional out-of pocket expenses.

Conclusion: Chronic pain occurs frequently, has a negative impact on the patient and society and treatment may not always be adequate. Chronic pain should be seen as an important public health problem deserving more attention of Dutch healthcare workers and policy makers.

Keywords: Chronic pain, epidemiology, prevalence, treatment, the Netherlands

INTRODUCTION

Estimates of the prevalence of chronic pain vary widely and typically range between 10 and 30% of the adult population, although prevalence rates ranging from 2 to 55% have been reported.[1-3] This wide variation may reflect true differences between populations, but also the use of different definitions and classifications of chronic pain in epidemiological studies, for example duration of more than three or more than six months, and differences in assessment methods.[2] Chronic pain is often reported to be more common among women and in older age groups.[1-3]

Subsequent to the variability in the definition of chronic pain, accurate data concerning prevalence, incidence, severity, treatment and utilisation of healthcare are scarce. National statistics in Europe do not tend to focus on chronic pain as a discrete entity, but rather see pain as part of other underlying diseases, a symptom. Additionally, many studies of chronic pain prevalence have been based in particular care settings, such as pain clinics, or in particular subgroups with certain underlying diseases. However, such data only represent subgroups of patients with chronic pain and do not provide insight into the general burden of chronic pain. Information about the epidemiology of chronic pain may dictate decisions of policy makers on the burden of the problem, health budget and prioritisation. Compared with cardiovascular disease, oncology, diabetes and mental health, there often seems to be limited appreciation by decision-makers about the importance of chronic pain.

This study aims to provide information on the epidemiology of chronic pain, including cancer pain in the Netherlands. Information is based on reviewing published and unpublished literature, using the principles of systematic reviews. Specifically, this study provides best evidence on the prevalence and incidence of chronic pain, the treatment(s) given to patients with chronic pain and the impact of chronic pain in the Netherlands.

This study is part of a bigger effort which aims to provide information about the epidemiology of chronic pain in Europe. In the first step the research is performed in the separate countries. This is the first report in a series, which gives data from the Netherlands. Reports of other countries will follow. In a second step an overall analysis will be performed.

MATERIAL AND METHODS

We undertook a literature review on the most recent epidemiological data on chronic pain, separating cancer pain and non-cancer pain where possible. For this purpose, we formulated 21 research questions such as: 'What is the prevalence of chronic pain in the Netherlands?', 'What is the incidence of chronic pain in the Netherlands?', 'How many patients with chronic pain are treated in the Netherlands?', etc. In this paper we will focus on the questions on prevalence, incidence, treatment and impact of chronic pain.

Search strategy

We aimed to identify all relevant studies regardless of publication status (published, unpublished, in press, and in progress), or language.

In August 2009, we searched the following databases from 1995 onwards: MEDLINE, EMBASE, CDSR (Cochrane Library issue 2 2009), CENTRAL (Cochrane Library issue 2 2009), DARE (August 2009, CRD website), HTA (August 2009, CRD website), Guidelines International Network database (GIN website). The search strategies were developed specifically for each database

Furthermore, references in retrieved articles and systematic reviews were checked. Supplementary searches were undertaken as appropriate. Relevant websites were searched for national statistics, insurance data, health surveys and other relevant data.

Selection of studies

Two reviewers independently inspected the title and abstract of each reference identified by the search and determined the potential relevance of each article. For potentially relevant articles, or in cases of disagreement, the full article was obtained, independently inspected, and inclusion criteria were be applied. Any disagreement was resolved through discussion. Justification for excluding studies from the review (after having retrieved potentially relevant articles) was documented.

Included studies were categorised in order to get a list of relevant studies per question. Where there were more than three studies addressing a single aspect of any question, for each question the most relevant studies were extracted using the following criteria: representativeness (populations representative of the general target population preferred), size (large preferred), date of study (most recent preferred) and quality (higher quality preferred). Studies were ranked by these criteria and the three or four highest ranking studies were extracted.

Inclusion criteria

We included primary studies (epidemiological, qualitative, cost analyses etc.) or systematic reviews of primary studies published from 1995 onwards. Only relevant primary data used in any systematic reviews identified and fulfilling the inclusion criteria were used in the data analysis. Studies had to examine patients with chronic cancer or non-cancer pain from the Netherlands. Chronic was defined as pain of at least three months or having a chronic disease associated with pain such as osteoarthritis, fibromyalgia, rheumatoid arthritis or cancer. Excluded were studies on children and adolescents, patients with headache / migraine, patients with angina pectoris, pain associated with very specific medical conditions, such as Parkinson's disease and multiple sclerosis.

Assessment of methodological quality

Quality assessment was carried out by one reviewer and checked by a second, using the checklist as outlined in *table 1*. This checklist was developed for this review and was based on standard tools for reporting of studies. For observational studies the items were based on the STROBE statement.[4] Studies were rated 'high quality' if at least 7 criteria were met (6 if not a longitudinal study), 'medium' if 5 or 6 criteria were met and 'low' if fewer criteria were met (i.e. ≥4 No's or Unclear). Any disagreements were resolved by consensus. The results of the quality assessment have been used for descriptive purposes to provide an evaluation of the overall quality of the included studies. Based on the findings of the quality assessment, recommendations have been made for the conduct of future studies.

Data extraction

For each study, data were extracted by one reviewer and checked by a second reviewer. Any disagreements were resolved by consensus. We employed a narrative method to present the data. Such a synthesis involves the use of narrative text and tables to summarise data in order to allow the reader to consider outcomes in the light

Table 1. *Quality criteria used for the assessment of the observational studies. Criteria were to be answered with 'yes', 'no' or 'unclear'*

Criteria	Explanation: criterion is adequate if
Adequate description of study design and setting	Authors reported study design, setting and period of study
Adequate description of eligibility criteria (incl. description of diagnostic criteria for chronic pain condition)	Authors reported inclusion/ exclusion criteria with diagnostic criteria to confirm diagnosis or confirmation that the doctors' patients had chronic pain
Study population is representative of target population (sample size, sample selection, demographics)	Authors described how the sample size was arrived at and how the patients were selected and the demographics of the sample should be described as comparable to the target population. For surveys, an attempt should be made to compare non-responders to responders
Adequate description of outcomes (and how / how often measured), exposures, predictors	Authors describe how they measure the outcome and clear definitions are given for key terms
Adequate description of statistical methods (incl. description of potential confounders and effect modifiers and how they were dealt with)	Authors describe their statistical methods and describe potential confounders or effect modifiers and how they were dealt with
Adequate description of study participants	Authors provide more than just age and gender (pain duration, occupations, pain type, etc.)
Adequate description of losses to follow-up (for longitudinal studies), loss to follow-up less than 10% at 12 months or less than 25% for longer follow-up	Authors clearly describe the losses to follow-up or if the loss is <10% by 12 months and <25% for periods longer than 12 months. NA for cross-sectional studies
Results reported as unadjusted and confounder-adjusted including precision	Authors report their results as unadjusted or confounder adjusted (or equivalent language – univariate, multivariate) and they provide precision (e.g. standard errors, standard deviations or confidence intervals). Authors should also indicate what confounders were adjusted for and why they were included.

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of differences in study designs and potential sources of bias for each of the studies being reviewed. Study characteristics and quality and results are presented in tables subdivided by questions.

In this review many different pain populations were examined. For clarity, the following terminology was employed: 'any chronic pain' included those with mild pain; 'general chronic pain' included those with cancer related pain.

RESULTS

The search yielded 16,619 references. Of these, 119 reporting on chronic pain in the Netherlands were included in this review. We selected at least three studies per question that provided the most recent, representative and valid data on data with respect to prevalence/ incidence/treatment or impact. *Tables 2 and 3* present basic characteristics and methodological quality of studies that were included in this paper.

PREVALENCE AND INCIDENCE OF CHRONIC PAIN CONDITIONS

The Dutch adult population was approximately 12.5 million people in 2009.[5] The prevalence of moderate to severe general chronic pain among Dutch adults was estimated at 18%.[3] The overall prevalence of unexplained severe general chronic pain has been described as 7.91 per 1000 enlisted patients in general practice.[6] The prevalence of any general chronic musculoskeletal pain is estimated at 44.4%.[7] This pain was most frequently located in the lower back (prevalence 21.2%) and in the shoulders (15.1%) and neck (14.3%). The prevalence of chronic widespread pain (in upper and lower extremities, in back or neck and in left and right side of the body) was 5.2%.[7]

In a group of patients with cancer, 55% reported to have pain and 44% reported moderate to severe pain ((VAS ≥4).[8] The prevalence of pain in cancer patients receiving palliative care during the last three months of life (n=238) was 65%.[9] *Figure 1* presents the prevalence of specific chronic pain conditions.

Only four studies reported on the incidence of chronic pain and all reported incidence of specific disorders related to chronic pain. The overall incidence rate of any neuropathic pain, including non-chronic pain, was described as 8.2 per 1000 person years (95% CI 8.0 to 8.4).[10] Mono-neuropathy and carpal tunnel syndrome were the most common types of neuropathic pain. The overall incidence rate of Complex Regional Pain Syndrome (CRPS) was calculated at 26.2 per 100,000 person-years (95% CI 23.0 to 29.7).[11] The incidence of CRPS was more than threefold higher in females than in males (RR 3.4, 95% CI 2.9 to 3.9). The incidence varied profoundly with age, the highest incident rate was observed in the group aged 61 to 70 years. The incidence of occupational disability (after 52 weeks of sick leave) as a result of back disorders was 2.02 and 2.14 per 1000 workers per year for men and women, respectively.[12] The incidence rate of persistent pain three months after herpes zoster diagnosis was reported in the medical records of 2.6% (95% CI 1.7 to 4.0).[13]

Table 2. *Basic characteristics of included studies*

Name of first author, publication date	Study design	Study method	Type of chronic pain	Sample size	Demographics (including pain severity)
Alonso et al. 2004[30]	Cross-sectional study	Self-administered questionnaires	Any arthritis pain Arthritis (defined as 'arthritis or a type of rheumatic disease'). The duration of pain was not reported.	Total study population 24,936 Netherlands n=4059	Mean age 43.4 (SD 17.9) 46.1% males Pain severity not reported
Boonen et al. 2005[23]	Cost-of-illness study	Patients completed a cost diary for the duration of the study.	Any FM, any CLBP and any AS	FM: n=69 CLBP: n=110 AS: n=111	FM: Mean age 44.9 (SD 9.4), 13% males CLBP: Mean age 40.9 (SD 8.7), 40% males AS: Mean age 47.8 (SD 10.1), 71% males Pain severity not reported
Borghouts et al. 1999[17]	Descriptive retrospective study	GPs provided information on procedures and patients completed a self-administered questionnaire covering a 12-month period	Any chronic neck pain	Eligible: n=517, assessed: 487 (253 responders – data from GPs and patients, 234 non-responders – data from GPs only)	Median age 51 (IQR 41-60), 60% females Mean pain severity for subgroup of responders 4.9 (SD 2.4) using an 11 point ordinal scale where 0 = no pain and 10 = unbearable pain
Borghouts et al. 1999[24]	Cost-of-illness study	Study is based on prevalent cases of neck pain. Direct and indirect medical costs were estimated using national registries, reports of research institutes and healthcare authorities	Any neck pain	Not reported	Not reported
Borgsteede et al. 2007[9]	Cross-sectional study	GPs received a post-mortem questionnaire for each patient who died during the survey year. Information was also retrieved from electronic records.	Any chronic cancer pain in palliative patients	n=238	Not reported
Breivik et al. 2006[3]/Pain in Europe 2003[31]	Cross-sectional study	Telephone survey in two parts. First, persons were screened for chronic pain. Of those with moderate to severe general chronic pain, 300 were interviewed in-depth.	Moderate to severe general chronic pain long-lasting pain for ≥6 months; pain in last month; pain ≥2 times/week; and rating pain intensity ≥5 on 10-point NRS	n=3197 screened and n=300 interviewed	Mean age 51.3 years; 60% female 18% reported severe chronic pain (8-10 on NRS) 82% reported moderate chronic pain (5-7 on NRS)
De Mos 2007[11]	Retrospective cohort study	A search conducted in the IPCI database – a longitudinal general practice research database	Any complex regional pain syndrome	Database contains records of >600,000 patients from more than 150 GPs	Population is representative of the Dutch population regarding age and sex.
Demyttenaere et al. 2007[21]	Cross-sectional study	Face-to-face survey	Any chronic back or neck pain (not defined)	Netherlands sample n=1094	Mean age 45.0 years; 50.9% female Pain severity not reported
De Wit et al. 1999[15]	Prospective cohort study (carried out as part of larger RCT)	Patient interviews, medical and nursing records	Any chronic cancer pain Pain duration at least 1 month	383 were eligible (70 declined to participate because study was too burdensome (68.6%), lack of motivation (21.4%) or being too ill (10%) 313 participated	Mean age 55.5 years (SD 12.4); 62.6% females
Dieleman et al. 2008[10]	Cohort study	Study conducted in the IPCI database – a longitudinal general practice research database containing data of more than 500,000 patients records	Any general neuropathic pain (including chronic and non-chronic pain)	362,693 persons (1,116,215 person years)	Age and gender distribution similar to Dutch population Pain severity not reported

Table 2 to be continued on page 145

Continued

Table 2. *Basic characteristics of included studies*

Name of first author, publication date	Study design	Study method	Type of chronic pain	Sample size	Demographics (including pain severity)
Enting et al. 2007[16]	Cross-sectional study	Self-administered questionnaires and interviews. Incomplete questionnaires were followed up by phone.	Any cancer pain	n=915 completed questionnaire, and n=246 had pain (27%)	Patients with pain: Females 60% Mean age not reported Mean pain intensities on a 0-10 scale: Present pain: 3.8 (SD 2.4) Worst pain: 6.4 (SD 2.4) Average pain: 4.1 (SD 2.2)
Huisstede et al. 2008[22] DMC_3 study (national health survey of musculoskeletal conditions)	Cross-sectional study	Postal questionnaires	Any chronic complaints of the arm, shoulder and/or neck Pain at baseline and lasting more than 3 months in the last 12 months	n=3664 n=996 with any chronic pain of the arm, shoulder and/or neck	Of those with pain: 25–44 years 26% 45–64 years 45% 65+ years 29% Female 63% Pain intensity: 5.4% had continuous severe pain and 12.7% recurrent severe pain
Kemler and Furnée, 2002[25]	Cross-sectional study	Patient completed a 7-day diary	Any chronic refractory complex regional pain syndrome (CRPS)	n=50	Mean age (SD)=39 (11) years 30% males, 70% females All had a mean pain intensity ≥5 (on a 10-p VAS)
Kerssens et al. 2002[6]	Cross-sectional study	Data were collected from the Dutch Sentinel Practice Network. GPs included patients based on the study's inclusion criteria and researchers searched the database using relevant codes from classifications regarding pain syndromes or pain medication.	Severe unexplained chronic pain Pain which had lasted at least 6 months.	n=586	Mean age not reported; 71% females
Lame et al. 2005[19]	Cross-sectional study	Patients completed mailed questionnaires	Any non-cancer chronic pain Locations: neck pain and/or brachialgia (23.3%); back pain and/or sciatica (27.9%); other pain, such as complex regional pain syndrome type I and II, neuropathic pain syndrome, trigeminus neuralgia, FM and RA (15.7%); multiple pain localisations (30.1%).	n=1208	Mean 49.9 years (SD 14.7) female 62% Pain severity not reported
Opstelten et al. 2005[13]	Cross-sectional study	A search conducted in the 'Huisartsen Netwerk Utrecht' database, a general practice research database over a 5-year period.	Any post herpetic neuralgia. Any pain that persisted at least 1 month after herpes zoster diagnosis.	n=837	58% female; mean age not reported
Picavet and Hoeymans 2004[20] DMC_3 study (National health survey of musculoskeletal conditions)	Cross-sectional study	Postal questionnaires	Any OA knee or hip, any osteoporosis, any RA, any other chronic arthritis and any FM	n=3664	Demographics and pain severity not reported
Picavet and Schouten 2003[7] (National health survey of musculoskeletal conditions)	Cross-sectional study	Postal questionnaires	Any general musculoskeletal pain Pain lasting ≥3 months. Cancer pain not excluded (4% had tumour pain)	n= 3664	50.9% females; Age: 47% 25-44 yrs, 34.6% 45-64 yrs, 18.4% 65+ yrs

Table 2. *Basic characteristics of included studies*

Name of first author, publication date	Study design	Study method	Type of chronic pain	Sample size	Demographics (including pain severity)
Rupp et al. 2006[32]	Cohort study	Self-administered postal questionnaire and twice a short clinical assessment	Any RA	Baseline n=882, follow up: n=529	Mean age 59.8 (SD 14.8) Female 71.9% Pain severity VAS 0–100 mm mean 40.6 (SD 28.1)
Smalbrugge et al. 2007[33] Amsterdam Groningen Elderly Depression (AGED) study	Cohort study	Two face to face interviews and chart review (for recognition of pain)	Any general pain in the elderly (included non-chronic pain)	n=350 at baseline 229 at follow up	Mean age 79.3; SD 8.3; female 68.9% At baseline 27.5% serious pain symptoms ('unbearable pain' or 'constant pain') and 40.5% mild pain symptoms (reported positive on other items but had no 'unbearable pain' and no 'constant pain') At follow up 58.6% 'unbearable pain' and 66.0% 'constant pain' still present at 6 m.
Steenstra et al. 2006[12]	Cross-sectional study	Descriptive study using statistics from the National Institute of Social Insurance between 1980-1985 and 1999-2000	Any chronic back pain in persons who claimed occupational disability due to back disorders. Persons can claim this after 52 weeks of sick-leave	In 1999-2000, the number of insured persons was 6,710,551	57% males; mean age not reported
Van den Beuken-Van Everdingen et al. 2007[8]	Cohort study	At the outpatient clinics, the treating physician filled out the medical data. The day after, each patient was sent the self-report questionnaire.	Any cancer pain (assumed chronic) 26% had breast cancer, 15% had gastrointestinal cancer, 14% had prostate cancer and 10% had lung cancer	n=1383 55% had cancer pain	Overall sample: 52% females; Age: 4% between 20-40, 33% between 40-60, 56% between 60-80 and 7% 80+ years
Van Herk et al. 2009[18]	Cross-sectional study	A standardised pain questionnaire and data from medical charts	Any general pain in nursing home residents (72% had pain ≥3 months)	n=233	Median age 79 years (IQR 73-84); 70% were female Median pain : 5 on a 11 point numerical rating scale (NRS where 0 = no pain and 10 = worst possible pain) (IQR 2-7), 88 reported moderate or severe pain (>= 4 on NRS)
Van Tulder et al. 1998[14]	Cohort study	GPs provided information on diagnosis and treatments. Patients completed questionnaires at baseline and during follow-up.	Any chronic low back pain (current symptoms for ≥3 months)	524 patients (368 participants – data from GPs and patients, 156 non-participants -data from GPs)	Mean age: 41.1 years (SD 10), 51% men Pain severity: mean (SD) 10-p scale at baseline 5.6 (2.9) median (IQR) NHP pain subscale at baseline 40.5 (10.5-69.8)

N = number; SD = standard deviation; GP = general practitioner; ICPC = International Classification of Primary Care; IQR = inter quartile range; NHP = Nottingham Health Profile; FM = fibromyalgia; CLBP = chronic low back pain; AS = ankylosing spondylitis; RA = rheumatoid arthritis; OA = osteoarthritis; NRS = Numerical Rating Scale; IASP = International Association for the Study of Pain; RCT = randomised controlled trial; CRPS = chronic refractory complex regional pain syndrome; VAS = visual analogue scale; ICD = International Classification of Diseases.

TREATMENT OF PATIENTS WITH CHRONIC PAIN

How many get treated

Of patients with general or non-cancer chronic pain, 57%[3] to 74%[14] get treated and this percentage ranged between 73 and 88% for patients with cancer pain.[15,16] Of the chronic non-cancer pain patients, 24.8 to 43% report not receiving treatment (*tables 4 and 5*).

What treatment do they receive?

A substantial proportion of the patients receive drug treatment for their pain. Rates vary between 21.6% for any chronic low back pain[14] up to 58% for any chronic neck pain[17] and 61% among nursing home residents with any pain,[18] the majority of patients receiving NSAIDS.

A significant number of patients reported the use of a range of different non-pharmacological interventions such as physiotherapy, acupuncture and postural advice (*table 4*).

Table 3. *Quality of studies included in this review*

Name of first author, publication date	Adequate description of study design and setting	Adequate description of eligibility criteria	Study population is representative of target population	Adequate description of outcomes, exposures, predictors	Adequate description of statistical methods	Adequate description of study participants	Adequate description of losses to follow-up	Results reported as unadjusted and confounder-adjusted including precision	Overall quality
Alonso 2004[30]	Yes	No	Yes	Yes	Yes	Yes	NA	Yes	High
Boonen 2005[23]	Yes	Yes	Unclear	Yes	Yes	Yes	Unclear	Unclear	Medium
Borghouts 1999[17]	Unclear	Yes	Unclear	Yes	Yes	Yes	NA	No	Medium
Borghouts 1999[24]	Yes	Unclear	Yes	Yes	Yes	No	NA	Unclear	Medium
Borgsteede 2007[9]	No	No	Unclear	Yes	No	No	NA	No	Low
Breivik 2006[3] / Pain in Europe 2003[31]	Yes	No	Unclear	Yes	No	Yes	NA	No	Low
De Mos 2007[11]	Yes	Yes	Yes	Yes	No	Yes	NA	No	Medium
Demyttenaere 2007[21]	Yes	No	Unclear	Yes	Yes	Yes	Unclear	Yes	Medium
De Wit 1999[15]	Unclear	Unclear	No	Yes	No	Yes	NA	No	Low
Dieleman 2008[10]	Yes	Yes	Yes	Yes	Yes	No	Unclear	Yes	Medium
Enting 2007[16]	Yes	Unclear	No	Unclear	No	No	NA	No	Low
Huisstede 2008[22]	Yes	No	Yes	Yes	Yes	Yes	NA	No	Medium
Kemler and Furnée 2002[25]	Unclear	Yes	Unclear	Yes	Unclear	Yes	NA	No	Low
Kerssens 2002[6]	Yes	Unclear	Yes	Yes	Yes	Unclear	NA	No	Medium
Lame 2005[19]	Yes	No	Unclear	Yes	Unclear	Yes	NA	Unclear	Low
Opstelten 2002[13]	Yes	Yes	Unclear	Yes	Yes	No	NA	Yes	Medium
Picavet & Hoeymans 2004[20]	Yes	No	Yes	Yes	Yes	No	NA	Yes	Medium
Picavet & Schouten, 2003[7]	Yes	No	Yes	Yes	Yes	Yes	NA	Yes	High
Rupp 2006[32]	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Medium
Smalbrugge 2007[33]	Yes	Yes	Unclear	Yes	Yes	Yes	No	Yes	Medium
Steenstra 2006[12]	Yes	Unclear	Yes	Yes	Yes	No	NA	No	Medium
Van den Beuken-Van Everdingen 2007[8]	Yes	Yes	Unclear	Yes	Yes	Yes	NA	Yes	High
Van Herk 2009[18]	Yes	Unclear	Unclear	Yes	No	Yes	NA	Unclear	Low
Van Tulder 1998[14]	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	No	Medium

NA = not applicable.
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Is treatment adequate?

Overall, 34 to 79% of the patients believe their pain is inadequately treated (*tabel* 5). In contrast, another study examined satisfaction for pain treatment among a group of nursing home residents with pain and found 60.3% to be satisfied while 21.2% were not.[18]

IMPACT OF CHRONIC PAIN

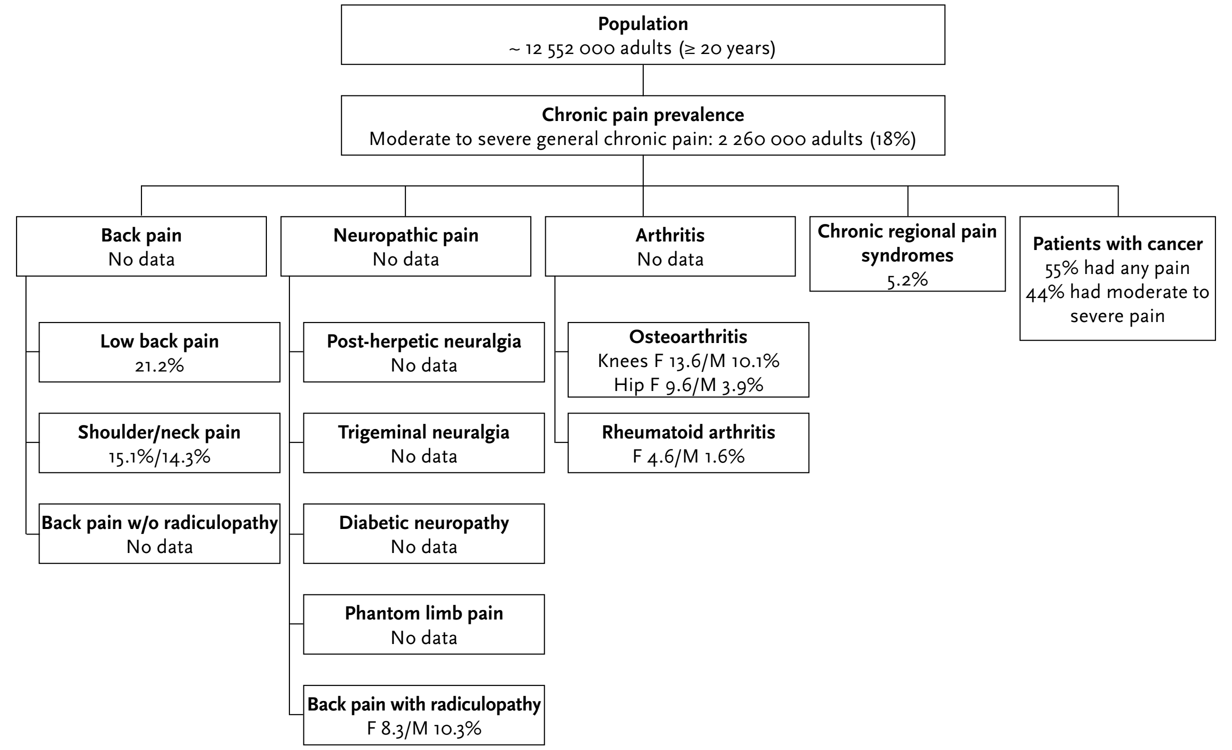
Tables 6 and 7 present the results of impact of pain on quality of life, activities of daily living (ADL), occurrence of mental diseases and days off work in Dutch chronic pain patients.

The impact of chronic pain on quality of life differs in the two studies using the Rand-36 (or SF-36) questionnaire. Patients with any non-cancer chronic pain, referred to a multidisciplinary university pain management clinic, reported a profound impact on quality of life with lowest quality on the 'role limitations physical' dimension.[19] Impact on quality of life among participants with chronic musculoskeletal pain was less, with the highest impact on the vitality dimension.[20]

Chronic pain also affects ADL and mental health. A study examining persons with moderate to severe chronic pain showed that 54% cannot function normally, that 46% cannot take care of themselves and other people and 19% report being diagnosed with depression.[3] Demyttenaere *et al.*[21] showed that some mental disorders (major depressive episode, dysthymia, generalised anxiety disorder and posttraumatic stress disorders) are significantly more prevalent in a group of persons with chronic neck or back pain compared with persons without such pain.

Chronic pain results in workdays lost. Breivik *et al.*[3] reported that on average 8.6 days were lost from work in the past six months in a group of persons with moderate to severe chronic pain. Two other studies reported on absenteeism due to chronic neck pain and found that about 15% were absent for at least a week due to chronic complaints of neck, shoulder and arm[22] and 20% in a sample with chronic neck pain.[17]

Figure 1. *Prevalence rates of specific pain disorders and cancer pain*[3,7,8]



F = females; M = males

One study reported direct medical and indirect costs due to three chronic disorders.[23] The total annual costs per patient were €7814 for fibromyalgia (17% direct medical costs), €8533 for chronic low back pain (13% direct medical costs) and €3205 for ankylosing spondylitis (32% direct medical costs). In 1996 costs due to any neck pain were $686.2 million, of which 77% was used for indirect medical costs.[24] Kemler and Furnee[25] reported that having chronic pain results in a decrease of net yearly income and additional costs. Mean out-of-pocket expenses related to CRPS of €1350 per patient per year were reported.

One study was found that reported on any impact of cancer pain on several aspects of quality of life.[16] Impact of pain was highest for daily activities and work and lowest on relations. No studies were found reporting on impact on ADL, depression, days of work and costs.

DISCUSSION

We performed a best-evidence review using principles of systematic reviewing on epidemiology of chronic pain in the Netherlands, and focused on prevalence/incidence of chronic pain, treatments given and impact of such pain. For each question, we selected the three or four best studies based on criteria of representativeness, size, recency and study quality. This review illustrates that chronic pain is a common problem among adults with a prevalence up to 44% for chronic musculoskeletal pain and 18% for moderate to severe general chronic pain. A substantial proportion of patients with chronic pain reported to receive no treatment (24.8 to 43%). Of those who get treatment, a considerable number feels their pain is not adequately controlled. Chronic pain has a negative impact on quality of life, ADL, mental status, and is associated with sick leave and high direct and indirect medical costs. There is some evidence that the above findings also apply for chronic cancer pain but this topic is poorly researched. Chronic pain deserves to be viewed as an important public health problem which warrants attention from healthcare workers and policy makers.

We identified a fair number of studies. However, in general the quality was poor, mainly because the representativeness of the examined population was unclear, and results were typically presented descriptively without adjustment for confounders. Also, many studies relied on self-reported pain which lacks confirmation of the diagnosis.

An important problem in interpreting the results of this review lies within the patient population of chronic pain. First, chronic pain is not considered to be a disease and therefore it is not registered as a separate entity in GP registries / hospitals. Therefore, hospital or GP practice based studies report on chronic pain in a healthcare-

Table 4. *Treatments received by patients with chronic pain*

Description of chronic pain	**% of the patients that get treated**	**Frequencies of drug treatment (for pain)**	**Frequencies of non-drug treatment**
General / non-cancer pain			
Moderate to severe chronic pain (Breivik et al. 2006; Pain in Europe 2003)[3 31]	57%	• 41% prescription medication • NSAIDs: 36% • COX 2 inhibitor: 16% • Weak opioids: 14% • Paracetamol: 11% • Strong opioids: 5%	Ever physiotherapy: 52% Ever acupuncture: 21% Ever massage: 17% Tried exercise: 14% Tried heat: 8% Tried herbal supplements: 7% Tried relaxation: 6% Tried support groups: 4% Tried nerve stimulation: 4% Tried ointments/creams: 4% Tried diet/special foods: 4%
Any general pain (incl non-chronic) in nursing home residents (Van Herk et al. 2009)[18]	61%	• Non-opioids: 42.5% • weak opioids: 8.5% • strong opioids: 10.5%	Not reported
Any chronic low back pain patients visiting their GP (Van Tulder et al. 1998)[14]	74%	Pain medication (any): 21.6% (95% CI 17.9, 25.3) • Paracetamol/aspirin: 3.9% (95% CI 2.3, 6.2) • NSAID: 16% (95% CI 12.8, 19.8) • Benzodiazepine: 3.3% (95% CI 1.8, 5.5) • Other medication: 0.7% (95% CI 0.1, 2.0)	Heat application: 4% (95% CI 2.4,6.2) (Bed)rest: 5.7% (95% CI 3.8, 8.2) Injection: 0.4% (95% CI 0.05,1.5) Postural advice: 6.1% (95% CI 4.1, 8.7) Work advice: 1.3% (95% CI 0.5, 2.7) Other treatment: 3% (95% CI 1.6, 4.9)
Any chronic neck pain patients visiting their GP (Borghouts et al. 1999)[17]	69%	Pain medication: • Paracetamol/aspirin/NSAID: 58% • Benzodiazepine: 10% • Antidepressants: 3% • Other medication: 8%	Heat application: 20% (Bed)rest: 11% Postural advice: 18% Collar: 3% Other treatment: 3%
Any general neuropathic pain (incl non-chronic pain) (Dieleman et al. 2008)[10]	53%	NSAIDs: 34.7% Benzodiazepines: 11.9% Sedative/hypnotics 9.1% Opioids: 6.6%. Anticonvulsants: 4.8% Tricyclic antidepressants : 4.7%	Not reported
Cancer pain			
Any chronic cancer pain (De Wit et al. 1999)[15]	88.2%	Non-opioids: 71.6% • Alone (WHO step I): 27.2% • in combination with WHO II/III/IV: 72.8% Weak or strong opioids: 69% • Alone : 24.5% • In combination with non-opioids: 75.5% • Weak opioids in combination with non-opioids: 94.1% • Strong opioids in combination with non-opioids: 57.9% Strong opioids (WHO step III/IV): 36.4% Parental medication (WHO step IV): 10.9%	Radiation therapy: 15.0% Chemotherapy: 12.1% Surgery: 2.6% Hormonal therapy: 1.6% Treatments such as nerve blocks or TENS: 3.6% Non-drug treatments: 89.9% • Positions/movements: 81% • Distraction: 45.7% • Use of heat or cold: 34.6% • Relaxation: 22.8% • Massage: 15.8% • Other: 11.9%
Any cancer pain (Van den Beuken-van Everdingen et al. 2007)[8]	Not reported	WHO step I: 15% WHO step II: 6% WHO step III: 7% Co-analgesics: 7%	Not reported
Any cancer pain (Enting et al. 2007)[16]	73%	73% (95% CI 68, 79%)	Not reported

GP = general practitioner; NSAIDs = non-steroid anti-inflammatory drug; CI = confidence interval; WHO = World Health Organization.

seeking population and hence a cause for the pain is searched for. In population-based studies, the prevalence of pain is influenced by a lack of gold standard for the diagnosis. Second, most studies focused on certain subpopulations, i.e. chronic low back pain, fibromyalgia, chronic repetitive strain injury (RSI). This results in a heterogeneous population in our review leading to dispersed results on prevalence/incidence, care seeking and impact of pain.

We found variation in the prevalence of chronic pain. This is a known problem in this field and may partly be explained by differences in the definition and classification

Table 5. *Patients with chronic pain that are untreated, inadequately treated and satisfaction of treatment*

Description of chronic pain	**Untreated (%)**	**Inadequately treated**	**Satisfied (self-report)**
General / non-cancer pain			
Moderate to severe general chronic pain (Breivik et al. 2006; Pain in Europe 2003)[3,31]	43%[1]	79%[3]	*Not selected for this research question*
Any general pain in nursing home residents (including non-chronic pain)(Van Herk et al. 2009)[18]	36%[2]	Opioids: 69.2%[4] Paracetamol : 30.8%[4]	*Not selected for this research question*
Any general pain in nursing home residents (including non-chronic pain)	24.8%[2]	34%[5]	60.3%
Subgroups:			
- those with moderate pain	22%		
- those with severe pain	29%		
Any chronic neck pain patients visiting their GP (Borghouts et al. 1999)[17]	31%[1]	*Not selected for this research question*	*Not selected for this research question*
Any chronic low back pain patients visiting their GP (Van Tulder et al. 1998)[14]	36%[1]	*Not selected for this research question*	*Not selected for this research question*
Cancer pain			
Any cancer pain (Enting et al. 2007)[16] For around the clock medication	*Not selected for this research question*	65% (95% CI 59, 71%)[5]	*Not selected for this research question*
Any cancer pain (Van den Beuken-van Everdingen et al. 2007[8]	*Not selected for this research question*	45% (95% CI 36, 54%)[5]	*Not selected for this research question*
Subgroups:			
- patients who received anti-cancer treatment with curative intent ≥6 m ago		73.6%[4]	
- patients receiving anti-cancer treatment with curative intent or last treatment < 6 m ago		81% 83.9%	
- patients receiving palliative anti-cancer treatment		70.6%	
- treatment not or no longer feasible		29.5%	
Cancer patients with chronic pain (De Wit *et al.* 1999)[15]	*Not selected for this research question*	*Not selected for this research question*	65.7% (11.3% were neither satisfied or dissatisfied and 12.3% were dissatisfied)
Subgroup of patients with moderate to severe pain			67.9%

1 Not receiving treatment for their pain in any way; 2 Not receiving analgesics; 3 Positive response to the question "Are there ever times when your pain medicine is not adequate to control your pain?'; 4 Prescribed Daily Dose/Defined Daily Dose ratio (PDD/DDD-ratio) below 2/3; 5 Indicated by negatives scores on the Pain Management Index.

of pain and study methods.[1,2,6] Studies on incidence of chronic pain were very sparse and were limited to the incidence of specific chronic conditions such as neuropathic pain and complex regional pain syndrome. Estimates of prevalence or incidence of any chronic pain in the Dutch population are hampered by the fact that pain is not considered to be a separate entity and therefore not registered as such in registries.

Although the prevalence varied, it is clear that the prevalence of chronic pain is much higher than the prevalence of any other chronic disease in the Netherlands, such as diabetes (in 2003, about 600,000 persons were diagnosed with diabetes in the general practice),[26] and coronary heart disorders (estimated prevalence in 2007 was between 300,000 and 1,000,000).[27] The prevalence of cancer is estimated at 400,000 persons in the Netherlands, which is about 2.5% of the population.[28]

Chronic pain has a negative impact on quality of life. In addition, chronic pain is associated with problems such as difficulties with ADL, depression and other mental health disorders which may further decrease quality of life. An effective treatment may help break through such a vicious circle and affect the life of persons with chronic pain in several ways. Chronic pain was also shown to influence the income of persons and their spouses in a negative way.[25]

Costs of chronic pain are not well researched. The most recent study used data from 2002 and showed substantial direct and indirect medical costs for three chronic diseases: fibromyalgia, chronic low back pain and ankylosing spondylitis.[23] The study on neck pain, although representative for the whole Dutch population, includes both acute and chronic neck pain and was based on data of at least ten years ago.[24] Therefore the complete burden of chronic pain is unclear from these studies.

In summary, chronic pain occurs frequently, has a negative impact for the patient and society and treatment may not always be adequate. Increasing the accessibility to adequate treatment for all chronic pain sufferers will reduce the negative consequences of it on individual and public health level. Therefore, chronic pain deserves to get more attention from all the stakeholders who are involved in chronic and oncological pain, such as Dutch healthcare workers and policy makers. Defining chronic pain in the Netherlands as a separate and important public health problem may make Dutch healthcare workers and policy makers more vigilant to this health problem.

Table 6. *Impact of chronic pain on quality of life*

Description of chronic pain	Impact on quality of life
Any non-cancer chronic pain (Lame et al. 2005)[19]	Dimensions of Rand-36* questionnaire, mean (SD): Physical Functioning: 41.3 (26.3) Social Functioning: 39.9 (27.0) Role Limitations Physical: 9.7 (24.3) Role Limitations Emotional: 46.6 (46.1) Mental Health: 56.7 (22.6) Vitality: 39.8 (20.4) Bodily Pain: 24.6 (17.9) General Health Perception: 44.7 (21.4)
Any chronic arthritis (Alonso et al. 2004)[30]	Persons with any chronic arthritis scored: 4.1 points lower than respondents without chronic conditions (who scored 53.4) on the Physical Summary Component of the Rand-36 1.0 point higher than respondents without chronic conditions (who scored 55.2) on the Mental Summary Component of the Rand-36
Any chronic musculoskeletal pain (Picavet and Hoeymans 2004)[20]	Dimensions of Rand-36 questionnaire, scores (SD): Physical Functioning: 82.5 (24.8) Social Functioning: 84.2 (23.1) Role Limitations Physical: 77.7 (37.8) Role Limitations Emotional: 87.2 (30.6) Mental Health: 77.3 (17.1) Vitality: 65.9 (20.0) Bodily Pain: 80.2 (23.6) General Health Perception: 69.4 (19.6) EQ-5D: % with any problem (SD) Mobility: 19 (43) Self care: 4.2 (22.7) Usual activities: 22.2 (43.1) Pain/discomfort: 45.2 (50) Anxiety/ depression: 18.6 (39.3)
Any cancer pain (Enting et al. 2007)[16]	Impact of pain on (percentage of patients reporting very much or quite a bit of interference): Daily activities: 51% Work: 47% Sleep: 41% Mood: 35% Enjoyment: 35% Walking: 34% Relations: 17%

*** score from 0-100, a higher score representing better quality of life.**

CONFLICTS OF INTEREST

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Table 7. *Impact on ADL, depression, days off work and costs*

Population	Impact on ADL	Impact on depression	Impact on days off work	Cost
Moderate to severe general chronic pain (Breivik et al. 2006[3]/ Pain in Europe 2003) [31]	54% cannot function normally 46% cannot take care of themselves and other people	19% reported being diagnosed with depression	Mean time lost from work in the past 6 months: 6.8 days	*Not selected for this research question*
Any chronic pain in neck, shoulder and arms (Huisstede et al. 2008) [22]	38.3% limitation in daily life	*Not selected for this research question*	Absenteeism among those employed: < 1 week: 7.8% 1-4 weeks: 7.5% >4 weeks: 7.8%	*Not selected for this research question*
Any chronic neck pain patients visiting their GP (Borghouts et al. 1999) [17]	*Not selected for this research question*	*Not selected for this research question*	Absenteeism among those employed: <1 week: 13% >1 week: 20%	*Not selected for this research question*
Any neck pain (Borghouts et al. 1999) [24]	*Not selected for this research question*	*Not selected for this research question*	*Not selected for this research question*	Society cost (1996): $686.2 million Direct medical costs: 23% Indirect medical costs: 77%
Any chronic neck and back pain (Demyttenaere et al. 2007)[21]	*Not selected for this research question*	Prevalence of mood disorders: persons without versus with chronic back/neck pain: Major depressive episode: 4.4 vs 9.4% Dysthymia: 1.2 vs 4.5% Generalised anxiety disorder: 0.8 vs 2.1% Agoraphobia or panic disorder: 1.7 vs 1.7% Social phobia: 1.0 vs 2.4% Posttraumatic stress disorder: 1.4 vs 7.4% Alcohol abuse/ dependence disorders: 1.7 vs 1.7%	*Not selected for this research question*	*Not selected for this research question*
Any rheumatoid arthritis (Rupp et al. 2006)[32]	Disability measured with the validated Dutch questionnaire capacities of daily life*: mean score (SD): 0.66 (0.62)	Dimensions of Rand-36 questionnaire, scores (SD): Mental summary component scale: 49.2 (11.4)	*Not selected for this research question*	*Not selected for this research question*
Any fibromyalgia pain, any chronic low back pain and any ankylosing spondylitis pain (Boonen et al. 2005)[23]	*Not selected for this research question*	*Not selected for this research question*	*Not selected for this research question*	Total annual costs per patient: fibromyalgia: €7814 (17% direct medical cost) chronic low back pain: €8533 (13% direct medical costs) ankylosing spondylitis: €3205 (32% direct medical costs)
Any chronic regional pain syndrome (Kemler and Furnée (2002)[25]	*Not selected for this research question*	*Not selected for this research question*	*Not selected for this research question*	Mean net yearly income decreased for : single: $8500 to $5500 male patients: $26,000 to $22,000 female patients: $24,500 to $22,500 Mean out-of-pocket expenses related to chronic regional pain syndrome: $ 1350 /patient / year.

***This questionnaire consists of 20 items measuring the degree of difficulty a patient has in performing activities of daily living (ADL) in 8 areas (dressing and grooming, arising, eating, walking, hygiene, gripping, reaching, and other activities). Responses to each item can range from 0 (no difficulty) to 3 (unable to do). The score is not influenced by the use of aids needed for certain ADL. The scores of each item were averaged to create an overall mean score (range 0–3, higher scores indicating more disability).**
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