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Course of back complaints in older adults: a systematic literature review

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Background. **Back pain is a common musculoskeletal complaint seen in older people. It is important to get an insight in the course of back complaints and to identify factors associated with a chronic course.**
Aim. **To describe the course of acute and subacute back complaints in older people (≥ 45 years) and to identify prognostic factors for developing chronic back complaints.**
Design. **Systematic review of the literature.**
Methods. **A database search was conducted in MEDLINE, EMBASE, Cochrane library, CINAHL, PsycINFO and PEDro. Cohort studies or randomized controlled trials reporting on the course of acute or subacute back complaints in older people were included. The percentage of patients that developed chronic back complaints was calculated, if possible.**
Results. **The search yielded 9293 potentially relevant articles. Of these, 5 studies met all inclusion criteria. At 3 months follow-up 37-40% of the patients still had back complaints. At 12 months follow-up, the percentage ranged from 26-45%. Older age was frequently reported as a prognostic factor for developing chronic back complaints of the whole study population. No prognostic factors could be retrieved for patients aged 45 years and older.**
Conclusions. **At 3 and 12 month follow-up, about 40% of the older people still reported back complaints. However, the heterogeneity of the studies made comparisons difficult. In order to get a clear insight in the course of back complaints in the older adult patients and to indentify prognostic factors for developing chronic back complaints in older people, high quality prospective cohort studies are needed.**
Clinical rehabilitation impact. **More than one-third of the older patients with back pain still experience complaints after 3 and 12 months**

KEY WORDS: Back pain - Adult - Prognosis.

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Back pain is a common musculoskeletal complaint seen in general practice. In the Dutch population the point prevalence was 26.9% for low back pain and 9.1% for thoracic back pain.[1] Because of the heterogeneity of the patient population and definition used in different studies 1 year prevalence of different studies ranges from 0.8% to 82.5%.[2] It is believed that back pain prevalence increases with increasing age, with peak prevalence around age 50-60 years; however, findings on prevalence are contradictory.[3, 4] Some studies suggest that older people report less frequent benign or mild pain but experience a higher prevalence of severe back pain and/or disabling episodes.[4, 5] Information on the general course of back pain is required to determine the duration of an episode and the severity in terms of pain and disability. Several reviews are written about the course of back pain,[6, 8] but they did not distinguish between different age categories.

Insight into the course and prognostic factors for developing chronic back complaints in older people is important because the prevalence of disability is high, especially older patients with back pain.[9, 10] Older people with back pain has more difficulty with activities of daily living such as lifting of objects, housework, climbing stairs and walking

than older patients without pain.[11, 12] There are several reasons why the course of back pain in older people may differ from the course of back pain in the younger population: age is reported as a prognostic factor for developing chronic back complaints,[13] older people may be more likely to develop chronic back complaints, and the prevalence of osteoarthritis, disc degeneration, osteoporosis and spinal stenosis are known to increase with increasing age.[4, 14] All these factors may also influence the course of back complaints.

Therefore, we conducted a systematic review of the literature to examine the course of back complaints in older people with acute or subacute back pain and to identify prognostic factors for developing chronic back complaints.

Materials and methods

Literature search

Studies were identified searching the databases Medline, Embase, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsycINFO, and Physiotherapy Evidence Database (PEDro), from their inception until April 2010. Keywords used were back pain (or low back pain or backache), cohort studies (or cohort or longitud* or prospect* or retrospect*), Randomized Controlled Trial (or controlled clinical trial), pain, disability or chronic*.

The reference lists of all relevant reviews and articles were also screened for eligible studies.

A study was included when it fulfilled all of the following criteria: patients had acute or subacute back pain (back pain lasting less than 12 weeks); patients were 45 years or older; the design was a cohort study (prospective as well as retrospective) or a randomized controlled trial; the study design was observational or the treatment was non-surgical; the follow-up period was at least 3 months; the course of the back pain was described in terms of back pain, disability or percentage of patients with chronic back pain; the article was written in English, Dutch, German or French.

The authors of this article choose to include patients with back pain of 45 years and older because this age category is often used in the literature.[1]

TABLE I.—*Criteria list for the methodological quality assessment.*

Study population	
a)	Inception cohort
b)	Description of source population
c)	Description of relevant inclusion and exclusion criteria
d)	Participants selected by random selection or as consecutive cases
Follow-Up	
e)	Follow-up at least 3 months
f)	Drop-outs/loss to follow-up< 20%
g)	Information completers versus loss to follow-up/drop-outs
h)	Prospective data collection
Prognostic factors	
i)	Clinical relevant potential prognostic factors
j)	Standardized or valid measurements
k)	Data presentation of most important prognostic factors
Outcome	
l)	Clinical relevant outcome measures
m)	Standardized or valid measurements
n)	Data presentation of most important outcome measures
Analysis	
o)	Appropriate univariate crude estimates
p)	Appropriate multivariate analysis techniques

Methodological quality assessment

The methodological quality of the selected studies was independently assessed by two reviewers (BK and JS) using the criteria list designed by Scholten-Peeters et al.,[15] adjusted for back pain (Table I).[19-25]

This criteria list assessed 5 domains: study population, follow-up, prognostic factors, outcome and analysis. The list consists of 16 items, which can be answered with "yes"/"no"/"don't know". The total quality score was computed by counting the number of positive scores. Higher scores indicate higher methodological quality. Disagreements between the two reviewers in assessment of the methodological quality were resolved by discussion and consensus of the two reviewers. The quality assessment will be used to gain insight in the possible biases of the included studies.

Data extraction

Study characteristics extracted from the included studies were: characteristics of the study population (setting, age, type of back pain), design, sample size, duration of follow-up, and outcome measures. Extracted outcome data were: pain, dis-

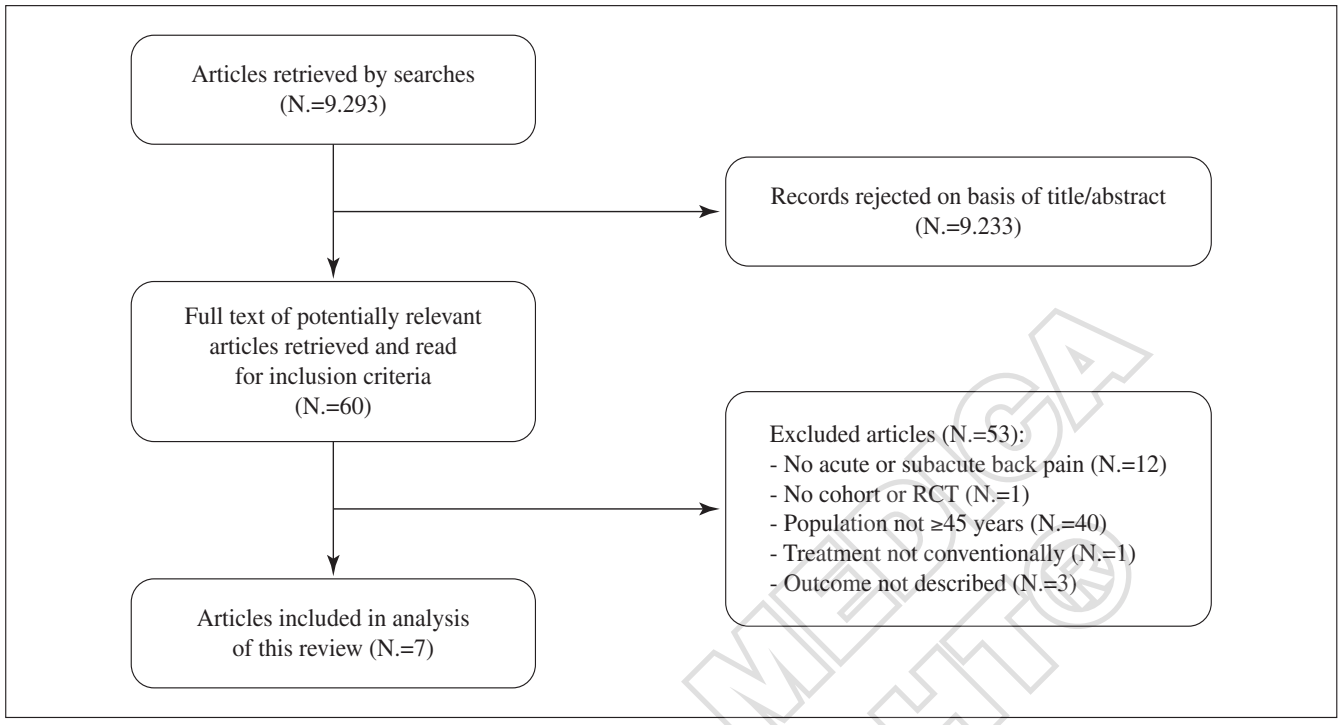

Figure 1.—Flow chart of the review.

ability and outcome measures related to chronic back pain.

When available, prognostic factors for developing chronic back complaints and corresponding measures of association were also extracted.

Data synthesis

Kappa statistics was used to calculate agreement between the reviewers regarding the quality assessment (<0.5 = poor level of agreement, 0.5-0.7 = moderate level of agreement, above 0.7 = high level of agreement).[16]

Chronic back pain is often defined as back pain lasting more than 3 months.[17, 18] Therefore, when possible, we computed the percentage of patients with chronic back complaints using the reported outcomes of the studies.

Study outcomes were statistically pooled if the studies were considered homogeneous.

If studies were heterogeneous, we refrained from pooling and described the outcomes of the included studies.

Results

Study characteristics

The flow chart of the review is presented in Figure 1. The search strategy resulted in 9,293 potentially relevant articles. After reviewing titles and abstracts, 60 potentially eligible articles were identified. After reviewing the full text, 7 articles met the inclusion criteria. This review includes 7 articles [19-25] describing 5 different studies. Two articles [21-22] describe different follow-up measurements for the same study population. In another two cohort studies,[19, 25] both the study populations were derived from the same cross-sectional population survey, but the articles described different outcome measures.

Table II presents the characteristics of the 5 included studies.

All studies were cohort studies, 4 prospective [19, 21-25] and 1 retrospective.[20] The follow-up period ranged from 3 months to 18 years. The patient populations were recruited in primary [19, 21-23, 25] or secondary care.[20, 24] Different types of back pain

TABLE II.—*Characteristics of the 5 studies described in 7 articles.*

Author (year)	Participants	Design	Age (N.)	Type of back pain	Follow-up	Outcome	Results		% chronic back complaints
1a. Croft (1998) [19]	Patients from 2 GP practices in Manchester, England	Prospective cohort study	18-75 years (490) Subgroup: 45-59 years (129) 60-75 years (91)	Low back pain	6 months	LBP consultation pattern in primary care	45-59 year No repeat consultation: Repeat <3 months: Repeat >3 months: 60-75 year No repeat consultation: Repeat <3 months: Repeat >3 months:	n (%) 65 (50) 50 (39) 14 (11) n (%) 49 (54) 36 (40) 6 (6)	<u>3 months</u> 45-59 year: 11% 60-75 year: 6%
1b. Thomas (1999) [25]	Patients from 2 GP practices in Manchester, England	Prospective cohort study	18-75 years (180) Subgroup: 45-59 years (61) 60-75 years (44)	Low back pain	1 week, 3 and 12 months	Persistent low back pain: ≥20 mm on VAS (pain) and <75% on Hanover	45-59 years: 60-75 years:	n 23 20	<u>12 months</u> 45-59 years: 38% 60-75 years: 45%
2. Greenough (1993) [20]	Patients treated non-surgically by a orthopaedic surgeon in Adelaide, Australia	Retro-spective cohort study	18-65 years (300) Subgroup: 46-65 year (50)	Back pain caused by a specific incident, which resulted in a low back injury	1,2,3,4 or 5 year	Outcome score: This scale is scored from 0-75 and transformed to 0-100	At follow-up: n-med(range) Compensation: Noncompensation:	 32-32 (16-74) 18-52 (27-72)	Not possible to compute.
3. Grottle (2005 &2007) [21, 22]	Patients from GP practices in Fredrikstad, Norway	Prospective cohort study	18-60 years (123) Subgroup: 45-60 years (31)	Low back pain with and without radiation, lasting <3 weeks	3 and 12 months	Recovery: Score ≤4 on the RDQ at follow-up	<u>3 months:</u> Recovered: Not recovered: <u>12 months:</u> Recovered: Not recovered:	n 19 12 n 21 8	<u>3 months</u> 45-60 years: 40% <u>12 months</u> 45-60 years: 26%
4. Jones (2006) [23]	Patients from GP practices in Cheshire, England	Prospective cohort study	18-65 years(974) Subgroup: 48-56 years (86) 56-65 years (85)	Low back pain	3 months	Persistent low back pain: ≥20 mm on VAS (pain) and ≥5 on RDQ	 48-56 years: 56-65 years:	n (%) 86 (37.2) 85 (37.1)	<u>3 months:</u> 48-56 years: 37.2% 56-65 years: 37.1%
5. Matsunaga (2000) [24]	Patients treated non-surgically at the Depart-ment of Ortho-paedic Surgery, Kagoshima, Japan	Prospective cohort study	Average age at initial examination: 58,6 years. Age range at the end of the study: 69-85 years (145)	Degenerative spondylo-listhesis	10-18 years (mean 15.8 years)	- Duration of LBP - Improvement of symptoms	- Mean duration of LBP: 3.2 months (range 1.5-6.8 months) - 77% experienced improvement		Not possible to compute

were reported: low back pain,[19,21-23,25] degenerative spondylolisthesis [24] and back pain caused by a specific incident resulting in low back injury.[20] Only one study included only older adult patients (aged 69-85 years) with back complaints.[24] The other four studies included patients aged ≥ 18 years with back

TABLE III.—*Methodological quality scores of the 5 included studies.*

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	score
Croft (1998), Thomas (1999) [19, 25]	+	+	-	+	+	+	+	+	+	+	+	-	+	+	+	+	14
Greenough (1993) [20]	+	+	+	-	+	+	-	-	+	+	+	+	-	+	-	+	11
Grottle (2005,2007) [21, 22]	+	+	+	-	+	+	-	+	+	+	+	+	+	+	+	+	14
Jones (2006) [23]	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+	+	14
Matsunaga (2000) [24]	+	+	-	+	+	-	-	+	+	?	+	-	?	-	-	-	7

+ means 'yes'
- means 'no'
? means 'don't know'
Criteria list: a) Inception cohort, b) Description of source population, c) Description of relevant inclusion and exclusion criteria, d) Participants selected by random selection or as consecutive cases, e) Follow-up at least 3 months, f) Drop-outs/loss to follow-up< 20%, g) Information completers versus loss to follow-up/drop-outs, h) Prospective data collection, i) Clinical relevant potential prognostic factors, j)Standardized or valid measurements, k) Data presentation of most important prognostic factors, l) Clinical relevant outcome measures, m) Standardized or valid measurements, n) Data presentation of most important outcome measures, o) Appropriate univariate crude estimates, p) Appropriate multivariate analysis techniques.

complaints, but described the course of back complaints in different age categories.[19-23, 25] The study of Croft *et al.* and Thomas *et al.* described the same age categories of 45-59 years and 60-75 years, because their study population was derived from the same cross-sectional population survey,[19, 25] Greenough *et al.* had a subgroup aged 46-65 years,[20] Jones *et al.* described the age categories of 48-56 years and 56-65 years [23] and Grottle *et al.* made a subgroup of patients aged 45-60 years.[21, 22]

All studies used different outcome measures to describe the course of back complaints in older adults (Table II). One study used two different outcome measures: an objective outcome measurement, *i.e.* consultations for back complaints after the index consultation [19] and a combination of pain intensity and disability scale.[25] The combination of pain intensity and disability scale was also used by another study.[23] Another study used the Roland Morris Disability Questionnaire (RMQ).[21, 22] One study designed an Outcome scale: this was a combination of questions about pain, activity, treatment, rest required and passive activities.[20] Another study described the duration of back pain and the experienced improvement of symptoms.[24]

Methodological quality

The Kappa value between the reviewers assessing the methodological quality was 0.69, which is considered a moderate level of agreement.[16] All disagreements were solved by consensus.

The quality scores of two articles [19, 25] were combined because their study population was derived from the same cross-sectional population survey.

Table III presents data on the methodological quality assessment of the 5 studies.

The overall quality score ranged from 7-14 points. One study [24] scored ≤50% of the maximum attainable score; to a large extent this can be attributed to lack of information on the prognostic factors.

Course of back pain

Due to differences in reported outcomes and outcome measurements it is difficult to combine the results of the studies.

The percentage of patients developing chronic complaints (back complaints after 3 months follow-up) ranged from 6-40%. Croft *et al.* reported a much lower percentage of patients developing chronic low back pain than the other studies: 11% in the age category 45-59 years and 6% in the age category 60-75 years.[19] However, Croft *et al.* used medical consumption (*i.e.* consultations for back complaints) as an outcome, whereas the other studies used back pain and/or disability scores.[22, 23] The proportion of patients developing chronic back complaints in these latter studies ranged from 37.1-40%.

Two studies reported the proportion of patients with back complaints at 12 month follow-up.[21, 25] One study reported a proportion of chronic back complaints of 38% in the age category 45-59 years and 45% in the age category 60-75 years, at 12 month follow-up.[25] The other study reported a somewhat lower proportion of patients with back complaints after 12 month follow-up: 26%.[21] Grottle *et al.* reported the proportion of patients with chronic back pain at 3 and 12 month follow-up; they found a 14%

decrease in the proportion of patients with chronic complaints after 12 month follow-up period compared to the 3 month follow-up period.[21, 22] All the studies described above had a methodological quality score of 14, indicating high quality.

In the studies of Greenough *et al.*[20] and Matsunaga *et al.*[24] it was not possible to compute the percentage of patients with chronic complaints at follow-up measurements. Matsunaga *et al.* reported a mean duration of low back pain of 3.2 (range 1.5-6.8) months, and that 77% of the patients experienced improvement of their symptoms during a 10-18 year follow-up period.[24] Greenough *et al.* designed the outcome scale to describe the function of back pain patients (The Outcome scale ranges from 0-100, with higher scores indicating better functioning). The mean outcome score was 32 (range 16-74) at follow-up for patients receiving workers' compensation and 52 (27-72) at follow-up for patients who did not receive workers' compensation.[20]

Differences between age categories

Three studies [19, 23, 25] compared different age categories and reported different results (Table II). One study found that the percentage of patients consulting their general practitioner (GP) at 3 month follow-up decreased from 11% in the category 45-59 years to 6% in the category 60-75 years.[19] Another study found no difference in the proportion of patients with persistent back pain between the age categories 48-56 years and 56-65 years.[23] A third study reported a slight increase in the percentage of patients with chronic back complaints in the older age category, after comparing the age category 45-59 years (38% of patients with chronic back complaints) with the age category 60-75 years (45% of patients with chronic back complaints).[25]

Prognostic factors for developing chronic back complaints

We could not retrieve any prognostic factor for developing chronic back complaints specifically for patients aged 45 years and older. Four studies [19-23, 25] described prognostic factors of the entire study population (patients aged ≥18 years), but did not report prognostic factors specifically for patients aged ≥45 years. Older age was reported as a prognostic factor for developing chronic back complaints at 3 and 12 months follow-up in 3 of these 4 studies which described prognostic factors.[20-22, 25] The other fourth study [23] found no association between age and chronic back complaints.

Discussion

Using a systematic approach, we summarized the results of the available studies to describe the course of acute or subacute back complaints in older people. At 3 months follow-up, 37.1-40% of the older adults continued to experience back pain or disability complaints. At 12 months follow-up, the percentage of patients with back complaints ranged from 26-45%. The percentage of patients consulting their GP at 3 months follow-up was 6-11%. This indicates that not all patients return to their GP because of their persisting back complaints.

Unfortunately all 5 included studies used different outcomes, *i.e.* disability and/or pain scales or a self-devised outcome scale. We computed the percentage of chronic complaints at 3 and 12 months follow-up using the reported outcomes in the studies; this was possible for 3 of the 5 studies. Although we used the different outcomes, the computed ranges were similar to those reported in other reviews [6, 8] which described the course of back complaints in adult patients (≥18 years). One review reported that 66-75% of all primary care patients with back pain continued to experience at least mild back pain or discomfort at 1 month follow-up; at 1 year follow-up, 33% still experienced back complaints of at least moderate intensity.[8] This is consistent with our conclusions. Another review reported that 62% (range 42-75%) of the patients still experienced pain at 12 month follow-up.[6] The computed percentage of chronic back complaints at 12 months follow-up ranged from 26-45% in our review. The wide range of percentages could be due to the heterogeneity of the studies.

We found conflicting results regarding the course of back complaints in the different age categories. One study found no difference in the percentage of patients with chronic back complaints between the age categories (48-56 *versus* 56-65 years),[23] whereas another study found that the percentage of patients with chronic back complaints increased by 7% in the older age category (45-59 years *versus* 60-75 years).[25] Another study found a decrease in patients

consulting their GP again for back complaints after 3 months in the age group 60-75 years compared to the age group of 45-59 years; however, they measured the back pain consultation rate instead of the severity in terms of back pain and disability.[19] Almost all the studies which were included in this review studied the total population and divided the population in different age categories. Therefore the younger age categories of these studies (<45 years) could be compared to the age categories described in this review. Most of the studies described that there is a higher percentage of patients with chronic back pain in the age categories >45 years than in the younger age categories, indicating that the course of older back pain patients differs from the younger population.[19, 21, 22]

One of our aims was to identify prognostic factors for developing chronic back complaints in older people. Unfortunately, none of the studies described prognostic factors for patients aged 45 years and older. Most of the studies investigated prognostic factors for the total population, without specifying factors for older people. However, in most studies older age was reported as a prognostic factor for developing chronic back complaints.[20-22, 25] According to one review (which is a review of reviews written on prognostic factors for developing chronic back complaints), older age is one of the prognostic factors that was frequently reported.[13]

One limitation of the present study is the heterogeneity of the studies, particularly the different outcomes used in the selected studies. For this reason we refrained from pooling. Therefore, it remains uncertain whether the same results would have emerged if the studies used the same (or comparable) outcome measure. The patient groups were also heterogeneous. Although most studies included patients with low back pain, not all studies specified the characteristics of the low back pain (*e.g.* with or without radiation, non-specific back complaints or specific back complaints). One study included only patients with degenerative spondylolisthesis, and this was the only study which included only older adult patients.[24] In the other studies, the population was divided into different age categories, resulting in small numbers of patients per category.

The age category used in this study (>45 years) is somewhat arbitrary. We choose age >45 years because it is often used in back pain literature and known absence of information about the course of back pain in elders. We described the different age categories (>45 years) reported by the included studies, if applicable. Because the number of older people will increase in the next years, it is important to have information about the course of back complaints in older adults.

Conclusions

This review shows that there are only a few (heterogeneous) studies written on the course of back pain in older adults, which indicates the need for further research. Prospective cohort studies, including only elderly patients, are needed to better describe the course of back complaints and to identify prognostic factors for developing chronic back complaints in this patient group.

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