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The Course and Prognosis of Hip Complaints in General Practice

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ABSTRACT

Background: *The general practitioner needs to discriminate complaints with need of specialist care from those that can be managed in primary care. However, no previous research has studied prognostic indicators for the course of hip complaints in a primary care population.* ***Purpose:*** *The purpose of this study was to investigate the course of hip complaints presented in general practice and to identify relevant prognostic indicators of outcome.* ***Methods:*** *Data were collected by means of self-administered questionnaires containing questions about sociodemographic variables, characteristics of the complaints, and several intraindividual and extraindividual factors, including several psychosocial variables (e.g., pain coping, distress, and kinesiophobia). After 3 and 12 months of follow-up perceived recovery, change in pain intensity and change in functioning were assessed. Multiple regression analyses were performed to investigate the association between the potential prognostic indicators and the 3 outcome measures.* ***Results:*** *We included 139 patients with hip complaints, presented in general practice. Only 24% reported recovery after 3 months, increasing to 37% after 12 months. A history of hip complaints, a longer duration of the current episode of hip complaints, or more severe complaints, were associated with a less favorable prognosis. Furthermore, more vital patients and patients who met the Norm for Healthy Activity had a higher probability of a favorable outcome. Pain transformation and worrying were significant associated with recovery and changes in functioning after 3 months.* ***Conclusions:*** *Different prognostic indicators were found to be associated with perceived recovery, changes in pain intensity, and changes in functioning. Future research should aim at investigating the mechanisms that can underlie these associations.*

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INTRODUCTION

Hip pain is a common health problem. A recent survey among the Dutch general population showed that during a 12-month period, prevalence of hip pain can be estimated at 13% and that this prevalence strongly increases with age (1). Other surveys in the United States and the United Kingdom reported point prevalences of hip pain up to 19% among adults age 65 and older. About 33% of people reporting hip complaints during the preceding year indicated that they had contacted their general practitioner (GP) for these complaints (1). This means that the GP is frequently confronted with these complaints. Furthermore, because the population is aging, one may expect that prevalence and incidence will increase in the near future. The overall impact of hip complaints on several aspects of health can be substantial, especially on physical functioning and pain (5,6), but also on health-related quality of life (7). In addition, hip complaints account for a substantial amount of health care costs, sick leave, and work disability (8–10). All these aspects indicate that hip complaints have a substantial impact on different aspects of society.

In Dutch public health care, the GP needs to initiate referrals to most other health care providers. Therefore, the GP needs to discriminate complaints with need of specialist care from those that can be managed in primary care. Such decisions require information about the risk of developing chronic pain and disability in relevant subgroups of patients. Knowledge about prognostic indicators can provide information about relevant subgroups. However, no previous research has studied prognostic indicators for the course of hip complaints in a primary care population.

Most research concerning hip complaints or hip osteoarthritis has been based in hospital settings or has studied risk

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factors for the onset of complaints (11–14). Nevertheless, some potential prognostic indicators of outcome can be derived from the available evidence. These include severity and duration of the complaint, and some intraindividual and extraindividual (environmental) factors like smoking, comorbidity, and working status. So far, the greater part of research has evaluated the prognostic value of clinical characteristics (symptoms and signs) whereas little attention has been given to the potential prognostic value of psychosocial factors. Psychosocial variables have been shown to be related to a high risk of chronicity in musculoskeletal illness in general (15,16), and to a decrease in functional status in rheumatoid arthritis (17). Besides other prognostic indicators, in this study, the prognostic value of psychosocial variables such as pain coping, distress, kinesiophobia, and social support were investigated.

The aims of this study were to describe the course of hip complaints in patients presented in general practice and to identify prognostic indicators of outcome in patients reporting a new episode of hip complaints.

METHODS

Design and Data Collection

A prospective cohort study was conducted in 61 general practices (97 GPs). These practices represent over 150,000 patients. The GPs who participated in this study were considered to be representative of all Dutch GPs. Half of the GPs participated in the second Dutch National Survey of General Practice carried out by the Netherlands Institute for Health Services Research in cooperation with the National Information Network of General Practice in 2001 (18). Patients who visited their general practitioner with a new episode of hip complaints were eligible for participation in the study if they met the following inclusion criteria: 18 years or older, capable of filling in Dutch questionnaires, and signed informed consent. Hip complaints were defined according to the patients themselves, by indicating the location of their pain on a manikin. If patients had not visited their GP for the same complaint during the preceding 3 months, their complaint was considered "new." Patients were excluded from the study if a patient was pregnant or if the cause of the complaint at issue was assumed to be a fracture, malignancy, replacement, amputation, or congenital defect.

Names and addresses of eligible and interested patients were sent to our institute. Individual patient data were collected by means of self-administered questionnaires at baseline and after 3 and 12 months of follow-up. These questionnaires contained questions about the outcome measures and potential predictors that are described later. Using these data, the course of hip complaints presented in general practice can be described and relevant prognostic indicators of outcome can be identified. The design of the study has been described in further detail elsewhere (19). The study protocol was approved by the Medical Ethics Committee of the VU University Medical Center.

Based on the estimated number of included variables in previous prognostic models, and a general rule of including at least 10 patients per determinant in a multiple regression model, we estimated that 100 patients would be sufficient to build a prognostic model for patients with hip complaints.

Outcome Measures

After 3 and after 12 months of follow-up, three outcome measures were assessed and used to predict prognosis: perceived recovery, changes in pain, and changes in functioning. To measure perceived recovery, the following question was asked: "Is the hip complaint, for which you visited your GP 3/12 months ago, still bothering you?" (response options: *yes* or *no*). At baseline and after 3 and 12 months of follow-up, pain and functioning were measured. An 11-point numerical rating scale was used to measure pain, with higher scores indicating more pain. Functioning was measured using the Physical Functioning subscale of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) (20,21), which was standardized to a score from 0 to 100, with higher scores indicating poorer functioning. By subtracting the 3 or 12 months follow-up score from the baseline score, changes in pain and functioning were calculated. Higher change scores indicated more reduction in pain or more improvement in functioning after 3 or 12 months of follow-up.

Potential Prognostic Indicators

A wide range of possible prognostic indicators were considered. The baseline questionnaire included sociodemographic characteristics, characteristics of the complaint, perceived pain and functioning, and several intraindividual and extraindividual factors, described in Table 1.

Sociodemographic characteristics, that is, age, gender, body mass index, smoking, employment, marital status, children (< 5 years) in household, and education were assessed as potential prognostic indicators. Characteristics of the complaint included questions about duration, location, history, severity, and perceived cause of the complaint. Patients were asked what they thought had caused their complaint (e.g., injury, work, aging, disease). Responders could indicate more than one cause. The association of each possible cause with outcome was analyzed separately. The baseline scores on the Pain scale and the Pain, Stiffness, and Physical Functioning subscales of the WOMAC were also analyzed as potential predictors.

Several intraindividual prognostic indicators were assessed. Single questions were used to assess the presence of menopause and use of pain medication. Pain coping strategies were measured using six subscales of the Pain Coping Inventory (22,23), with higher scores indicating more use of the strategy concerned. Distress was assessed using a shortened version of the subscale Distress from the Four Dimensional Symptom Questionnaire (24), with higher scores indicating more distress. Kinesiophobia was measured using two subscales derived from the Tampa Scale (25) and Fear-Avoidance and Beliefs Questionnaire (with higher scores indicating more kinesiophobia) (26). We measured overall quality of life using a single question, asking the following: "How would you rate your quality of life in general?" It was scored on a 5-point rating scale, based on the format of the General Health Perceptions subscale of the Short

Form–36 (SF–36). Higher scores represent better perceived quality of life. Perceived general health and vitality were measured using two subscales from the SF–36 (Medical Outcomes Study 36-item Short Form Health Survey) (27): General Health Perceptions and Vitality, with a higher score indicating better general health or being more vital. A list of complaints and diseases (28) was included in the baseline questionnaire to measure comorbidity. In addition, coexisting other musculoskeletal complaints were assessed.

A number of extraindividual prognostic indicators were measured using the following question(aire)s. The Norm for Healthy Activity was used to measure physical activity. This norm recommends that all adults should accumulate 30 min or more of moderately intensive physical activity on at least 5 days of the week (29,30). Furthermore, the position stand of the American College of Sports Medicine was used, which recommends heavy physical exercise or sports at least 3 times a week (31). We measured if patients met the norm. The Social Support Scale (32) was used to measure social support, with higher scores indicating less social support.

All prognostic indicators have been described in more detail elsewhere (19).

At first, all prognostic indicators were analyzed as dichotomous or continuous variables. Tertiles were created in case of a nonlinear relationship of the prognostic indicator with the outcome. The prognostic indicator was then analyzed as a categorical variable.

Statistical Analyses

Descriptive statistics were used to describe the course of the hip complaints. Perceived recovery (percentage) and mean changes on the subscales of Pain, Stiffness, and Physical Functioning of the WOMAC were calculated.

To predict outcome after 3 and 12 months of follow-up, multiple regression analyses were used. To predict perceived recovery, Cox proportional hazards analysis was used with equal survival time for all participants. Linear regression analysis was used to predict change in pain and functioning.

To begin, the association of all possible prognostic indicators with the outcome were analyzed one by one in univariate analyses. All prognostic indicators with a $p < .20$ in the univariate analysis were included in the multiple regression model. After that, prognostic models were constructed using a stepwise backward procedure. Starting with all prognostic indicators with a $p < .20$, the variable showing the least significant association with the outcome was manually excluded from the model. The model was considered complete if all variables in the model showed significance levels less than .10. If the number of prognostic indicators to be entered in the model exceeded n/10, the prognostic indicators were entered in groups. First all sociodemographic prognostic indicators were entered, and all prognostic indicators with $p < .20$ retained. Subsequently, prognostic indicators concerning characteristics of the complaint were added, and finally prognostic indicators concerning intraindividual and extraindividual factors.

To assess the goodness of fit of the linear models, the proportion of explained variance (R^2) was calculated. To estimate the predictive accuracy of the Cox regression models, individual survival functions were calculated and converted into individual probabilities of recovery. These probabilities were used to construct receiver operating curves (ROC). The areas under the ROC curve (AUC) plus 95% confidence intervals were calculated as measures of the discriminative power of the models.

RESULTS

We included 139 patients who presented with a new episode of hip complaints in general practice and completed the baseline questionnaire. Of them, 89% returned the questionnaire after 3 months and 80% returned the questionnaire after 12 months. Baseline characteristics of the patients are shown in Table 1. The dropouts did not differ from the responders according to age, sex, and baseline pain, and WOMAC scores.

TABLE 1
Patient Characteristics at Baseline

Patient Characteristics	*Baseline Scores*
Sociodemographic	
Age (*M*, *SD* years)	51.7 (15.7)
Gender (% male)	31.7
Body mass index (*M*, *SD* weight/height^2)	25.9 (4.1)
Smoking (% yes/ever)	68.3
% Working	45.7
Marital status (% living together/married)	77.0
% children in household	43.1
% children < 5 in household	14.1
Education (%)	
Primary	42.0
Secondary	44.2
College/university	13.8
Characteristics of the hip complaint (%)	
Location of the hip complaint (one hip)	86.1

(continued)

TABLE 1 (*Continued*)

Patient Characteristics	*Baseline Scores*
Duration of the hip complaint	
< 1 week	7.3
1–2 weeks	9.5
3–4 weeks	16.8
1–2 months	13.1
3–6 months	13.9
> 6 months	39.4
Had hip complaint before (yes)	55.4
Severity of the hip complaint	
Almost always bothering	41.0
Regularly bothering	27.3
Bothering now and then	22.3
Not bothering	9.4
Perceived cause of the hip complaint[a]	
Overload during usual activities	17.3
Overload during unusual activities	5.8
Overload during exercise	15.1
Injury during exercise	2.9
Injury	7.2
Stress	7.9
Illness	5.0
Unknown	45.3
Other	22.3
Outcome measures (*M* score, *SD*)	
Pain on a 11-point numerical rating scale	5.1 (2.2)
WOMAC Pain subscale (0–100)	45.6 (19.8)
WOMAC Stiffness subscales (0–100)	43.6 (26.0)
WOMAC Functioning subscale (0–100)	42.3 (21.4)
Intraindividual factors	
% in menopause	10.8
% taking pain medication	64.7
Pain coping (*M* score, *SD*)	
PCI subscale 1: Pain Transformation (4–16)	8.6 (2.8)
PCI subscale 2: Distraction (5–20)	10.7 (3.1)
PCI subscale 3: Reducing demands (3–12)	6.0 (1.8)
PCI subscale 4: Retreating (7–28)	10.7 (3.7)
PCI subscale 5: Worrying (9–36)	15.6 (4.2)
PCI subscale 6: Resting (5–20)	9.6 (2.9)
Distress—4DSQ subscale (0–12; *M* score, *SD*)	4.0 (3.2)
Kinesiophobia–1: Fear and avoidance of activity (0–100; *M* score, *SD*)	50.3 (16.1)
Kinesiophobia–2: Importance of activity (0–100; *M* score, *SD*)	50.4 (22.1)
Perceived General Health: subscale from SF–36 (1–5; *M* score, *SD*)	2.9 (0.8)
Quality of life: 5-point rating scale (*M* score, *SD*)	2.7 (0.7)
Vitality: subscale from SF–36 (0–100; *M* score, *SD*)	58.5 (17.0)
Kind of musculoskeletal complaints (%)	
Only a hip complaint	23.4
More complaints of the lower extremities	8.8
Musculoskeletal complaints of both upper and lower extremities	67.8
Comorbidity (% yes)	46.3
Extraindividual factors	
ACSM position stand (% meet the norm)	11.1
Norm for healthy activity (% meet the norm)	41.5
Social support: Social Support Scale (12–60; *M* score, *SD*)	19.1 (8.0)

Note. *n* = 139. WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index; PCI = Pain Coping Inventory; 4DSQ = Four Dimensional Symptom Questionnaire; SF–36 = Medical Outcomes Study 36-item Short Form Health Survey; ACSM = American College of Sports Medicine.

[a]Responders could indicate more than one cause.

Course of Hip Complaints

After 3 months of follow-up, 24% of the patients indicated that they were recovered. This proportion increased to 37% after 12 months.

Mean scores in pain intensity declined during the study period. Mean pain intensity score was 5.0 (*SD* = 2.2) at baseline, 3.6 (*SE* = 2.7) after 3 months (27% reduction, $p < 0.01$), and 3.0 (*SD* = 3.0) after 12 months (41% reduction, $p < .01$). Patients who were not recovered after 12 months, however, showed some improvement in pain: They scored 5.3 (*SD* = 2.1) at baseline and 4.5 (*SD* = 2.6) after 12 months of follow-up. Patients who were recovered indicated that they (almost) did not have any pain anymore: They scored 4.8 (*SD* = 2.5) at baseline and 0.4 (*SD* = 1.2) after 12 months of follow-up.

Figure 1 represents the course of the WOMAC scores. All subscales showed a statistically significant improvement both after 3 and 12 months ($p < .01$), compared to baseline scores. Improvements ranged from 18% (WOMAC stiffness) to 34% (WOMAC pain) after 3 months and ranged from 25% (WOMAC stiffness) to 41% (WOMAC pain) after 12 months. After 12 months, WOMAC stiffness and WOMAC pain were not statistically different from 3 months of follow-up. After 12 months of follow-up, WOMAC functioning did show a statistically significant difference in contrast with 3 months of follow-up ($p < .05$). As for the scores in pain intensity, scores on the WOMAC subscales did show some improvement for patients who were not recovered after 12 months: Their mean scores after 12 months were 5 to 10 points lower than their mean scores at baseline.

Prognostic Indicators of Outcome

Because of nonlinearity, some prognostic indicators needed to be analyzed as categorical variables instead of continuous or dichotomous variables. This concerned the following prognostic indicators: several coping strategies, distress, vitality, and the two kinesiophobia subscales. Tables 2 and 3 show how each of the prognostic indicators were analyzed: as a dichotomous, continuous variable or categorical variable.

Table 4 presents the variables that showed a significant association with recovery, a change in pain intensity, or a change in functioning in the univariate analyses after 3 or 12 months. These prognostic indicators were considered in the multivariate analyses. A statistically significant association with all outcome measures ($p < .20$) both after 3 and after 12 months was seen for age, the duration of the hip complaint, having had a hip complaint before, severity of the hip complaint, as well as for having coexisting musculoskeletal complaints.

Prognostic Indicators of Outcome after 3 Months

Table 2 demonstrates the variables which were significantly related to recovery, a change in pain intensity, or a change in functioning after 3 months. A shorter duration of the hip complaint, not having had a hip complaint before, and a low score on the Pain Coping subscale "worrying," were associated with a higher probability of recovery after 3 months. The area under the ROC curve was 0.91 (95% confidence interval: 0.86–0.97). The following variables were related to more reduction in pain intensity after 3 months: not smoking, a shorter duration of the hip complaint, more severe hip complaints at baseline, the perceived cause of the complaint was overload during unusual activities or overload during exercise, having more pain at baseline, and meeting the norm for healthy activity. The multiple regression model explained 60% of the variance of change in pain intensity. More improvement in functioning after 3 months was correlated with the following variables: a shorter duration of the hip complaint, the perceived cause of the complaint was overload during unusual activities, less pain at baseline on the WOMAC subscale Pain, worse WOMAC functioning scores at baseline, having a low score on the pain coping subscale Pain

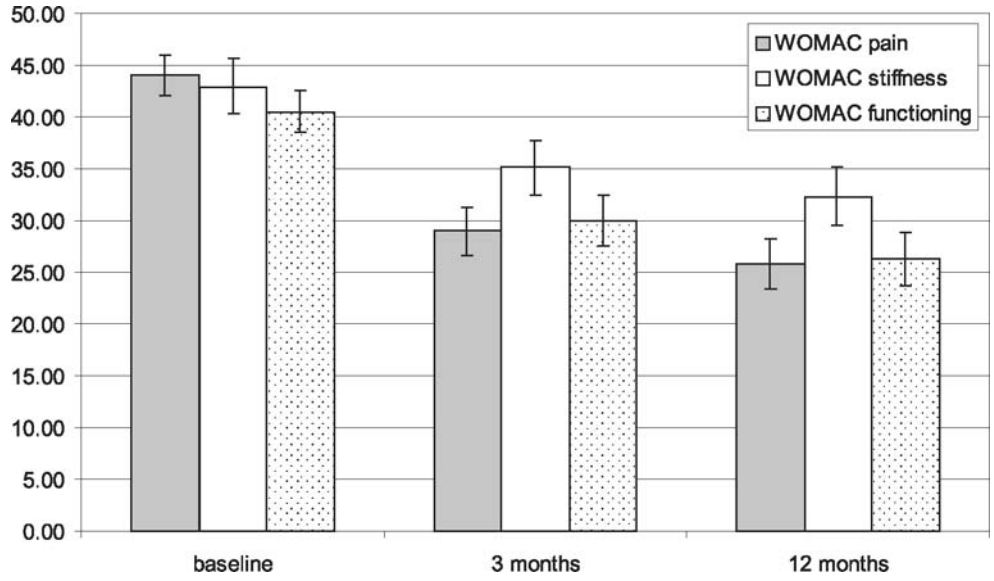

FIGURE 1 The course of Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores (mean scores and *SE*, range = 1–100) in patients with hip complaints in general practice.

TABLE 2

Prognostic Indicators of Recovery (AUC = 0.91), Change in Pain Intensity (R^2 = 0.60), and Change in Functioning (R^2 = 0.49) After 3 Months

		Recovery			*Change in Pain*			*Change in Functioning*		
Sociodemographic	*Analysis*	*HR*[a]	*95% CI*	*p*	*b*[b]	*95% CI*	*p*	*b*	*95% CI*	*p*
Smoking	vs. not				–0.95	–1.67 to –0.23	.01			
Characteristics hip complaint										
Duration hip complaint	Continuous	0.68	0.53 to 0.88	.00	–0.63	–0.85 to –0.41	.00	–5.88	–7.72 to –4.04	.00
Had hip complaint before	vs. not	0.21	0.06 to 0.73	.01						
Severity hip complaint	Continuous				0.46	0.09 to 0.83	.02			
Cause: Overload during unusual activities	vs. not				1.65	0.32 to 2.98	.02	11.19	–0.94 to 23.32	.07
Cause: Overload during exercise	vs. not				1.57	0.65 to 2.49	.00			
Baseline scores										
Pain	continuous				0.72	0.56 to 0.88	.00			
WOMAC Pain	Continuous				–0.24	–0.48 to 0.00	.05			
WOMAC Functioning	Continuous							0.68	0.45 to 0.92	.00
Intraindividual										
PCI1: Pain transformation										
Middle tertil	vs. lowest tertile							–7.15	–15.14 to 0.83	.08
Highest tertile	vs. lowest tertile							–4.13	–13.11 to 4.85	.36
PCI5: Worrying										
Middle tertile	vs. lowest tertile	0.79	0.36 to 1.74	.56						
Highest tertile	vs. lowest tertile	0.35	0.12 to 1.01	0.05						
Comorbidity	vs. not							–12.06	–18.27 to –5.85	.00
Extraindividual										
Norm healthy activity	vs. not meeting norm				0.95	0.27 to 1.63	.01			

Note. AUC = the area under the ROC curve; HR = hazard ratio; CI = confidence interval; b = regression coefficient; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index; PCI = Pain Coping Inventory.

[a]HR < 1.00 = a reduced probability of recovery compared to the reference group; HR > 1.00 = an increased probability of recovery compared to the reference group.

[b]b > 0 = greater reduction in pain or more improvement in functioning, b < 0 = less reduction in pain or less improvement in functioning.

TABLE 3

Prognostic Indicators of Recovery (AUC = 0.89), Change in Pain Intensity (R^2 = .46) and Change in Functioning (R^2 = .54) After 12 Months

		Recovery			*Change in Pain*			*Change in Functioning*		
Sociodemographic	*Analysis*	*HR*[a]	*95% CI*	*p*	*b*[b]	*95% CI*	*p*	*b*	*95% CI*	*p*
Smoking	vs. not							–8.46	–15.84 to –1.07	.03
Working	vs. not				1.49	0.62 to 2.35	.001	4.86	7.87 to 21.85	.00
Characteristics hip complaint										
Duration hip complaint	Continuous	0.67	0.55 to 0.82	0.00				–6.46	–8.58 to –4.33	.00
Had hip complaint before	vs. not				–1.43	–2.30 to –0.55	.00			
Severity hip complaint	continous				0.86	0.42 to 1.29	.00			
Cause: Overload during exercise	vs. not	2.03	1.06 to 3.89	0.03						
Baseline scores										
Pain	Continuous				0.73	0.53 to 0.93	.00	2.22	–0.06 to 4.50	.06
WOMAC Functioning	Continuous							0.44	0.21 to 0.68	.00
Intraindividual										
Vitality										
Middle tertile	vs. lowest tertile	1.79	0.78 to 4.09	.17				11.48	3.63 to 19.34	.01
Highest tertile	vs. lowest tertile	2.52	1.18 to 5.41	0.02				14.83	5.67 to 24.00	.00
Extraindividual										
Norm healthy activity	vs. not meeting norm				0.80	–0.05 to 1.65	.06			

Note. AUC = the area under the ROC curve; HR = hazard ratio; CI = confidence interval; b = regression coefficient; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index.

[a]HR < 1.00 = a reduced probability of recovery compared to the reference group; HR > 1.00 = an increased probability of recovery compared to the reference group.

[b]b > 0 = greater reduction in pain or more improvement in functioning; b < 0 = less reduction in pain or less improvement in functioning.

TABLE 4
Results of the Univariate Analyses: Significant Predictors ($p < .20$), Entered in Multiple Regression Analysis

	After 3 Months						*After 12 Months*					
	Recovery		*Change in Pain*		*Change in Functioning*		*Recovery*		*Change in Pain*		*Change in Functioning*	
Sociodemographic	*HR*[a]	*95% CI*	*b*[b]	*95% CI*	*b*	*95% CI*	*HR*	*95% CI*	*b*	*95% CI*	*b*	*95% CI*
Age	0.98	0.96 to 1.00	–0.05	–0.08 to –0.01	–0.40	–0.66 to 0.14	0.98	0.96 to 1.00	–0.06	–0.09 to –0.02	–0.50	–0.80 to –0.20
BMI			–0.12	–0.24 to –0.01	–0.92	–1.92 to 0.08						
BMI > 25	0.56	0.27 to 1.15					0.40	0.21 to 0.78	–1.54	–2.68 to –0.40	–13.83	–23.11 to –4.55
Smoking			–1.27	–2.31 to –0.23					–1.12	–2.34 to 0.10	–6.75	–16.94 to 3.43
Working	1.86	0.89 to 3.85			6.85	–1.41 to 15.11	1.88	1.00 to 3.51	1.76	0.66 to 2.87	14.46	5.40 to 23.53
Marital status	1.80	0.84 to 3.84										
Children					6.04	–2.36 to 14.45					7.45	–2.02 to 16.93
Education (middle vs. lower)									–0.82	–2.06 to 0.42	–10.06	–20.30 to 0.18
Characteristics hip complaint												
Location hip complaint	0.21	0.03 to 1.56										
Duration hip complaint	0.59	0.47 to 0.73	–0.66	–0.93 to –0.39	–5.80	–8.00 to –3.59	0.67	0.56 to 0.81	–0.61	–0.94 to –0.28	–6.51	–9.11 to –3.91
Had hip complaint before	0.09	0.03 to 0.28	–1.54	–2.50 to –0.58	–13.92	–21.91 to –5.93	0.31	0.16 to 0.62	–1.89	–2.98 to –0.80	–16.23	–24.18 to –7.29
Severity of the hip complaint	1.83	1.31 to 2.55	0.60	0.13 to 1.08	3.50	–0.53 to 7.53	1.81	1.36 to 2.41	0.96	0.42 to 1.49	6.15	1.66 to 10.64
Causes												
Overload during unusual activities	2.23	0.78 to 6.39	1.99	0.02 to 4.00	20.44	4.17 to 36.70					14.21	–6.26 to 34.67
Overload during exercise	2.01	0.90 to 4.51	1.34	–0.00 to 2.69	9.76	–1.50 to 21.02	2.36	1.24 to 4.50				
Injury during exercise	2.88	0.69 to 12.09	2.68	–0.50 to 5.85	43.89	18.45 to 69.32					21.27	–3.44 to 45.97
Stress					–12.39	–27.28 to 2.50			–1.69	–3.66 to 0.29	–14.17	–30.25 to 1.92
Illness									–1.82	–4.56 to 0.92		
Unknown									0.76	–0.38 to 1.90		
Other			–1.29	–2.45 to –0.14			0.50	0.20 to 1.28				
Baseline scores												
Pain			0.59	0.40 to 0.79	2.22	0.37 to 4.06			0.55	0.32 to 0.78	3.64	1.61 to 5.66
WOMAC Pain	0.99	0.97 to 1.00			0.22	0.01 to 0.43	0.98	0.97 to 1.00			0.28	0.04 to 0.52
WOMAC Stiffness	0.99	0.97 to 1.00			0.13	–0.03 to 0.28	0.99	0.98 to 1.00				
WOMAC Functioning			0.02	0.00 to 0.04	0.45	0.27 to 0.64			0.03	0.00 to 0.06	0.47	0.27 to 0.68
Intraindividual												
Pain medication					–7.33	–16.05 to 1.40						
PCI1: Pain transformation												
Middle vs. lowest tertile	0.50	0.23 to 1.08			–8.67	–19.56 to 2.22	0.67	0.33 to 1.36				
Highest vs. lowest tertile	0.20	0.07 to 0.62			–4.64	–16.10 to 6.82	0.52	0.23 to 1.16				
PCI4: Retreating												
Middle vs. lowest tertile											0.73	–10.85 to 12.31
Highest vs. lowest tertile											7.57	–3.76 to 18.91

(continued)

TABLE 4 (*Continued*)

	After 3 Months						*After 12 Months*					
	Recovery		*Change in Pain*		*Change in Functioning*		*Recovery*		*Change in Pain*		*Change in Functioning*	
Sociodemographic	*HR*[a]	*95% CI*	*b*[b]	*95% CI*	*b*	*95% CI*	*HR*	*95% CI*	*b*	*95% CI*	*b*	*95% CI*
PCI5: Worrying												
Middle vs. lowest tertile	1.05	0.48 to 2.31										
Hghest vs. lowest tertile	0.30	0.11 to 0.85										
PCI6: Resting												
Middle vs. lowest tertile	0.68	0.31 to 1.49	0.38	–0.82 to 1.57								
Highest vs. lowest tertile	0.37	0.13 to 1.05	–0.98	–2.24 to 0.29								
Distress												
Middle vs. lowest tertile					4.75	–5.86 to 15.36						
Highest vs. lowest tertile					12.20	–2.27 to 26.67						
Kinesiophobia:												
Importance of exercise												
Middle vs. lowest tertile			0.98	–0.37 to 2.33			1.94	0.67 to 5.58				
Highest vs. lowest tertile			0.32	–1.24 to 1.88			2.32	0.76 to 7.12				
General health			–0.52	–1.17 to 0.12	–4.08	–9.57 to 1.42	0.70	0.49 to 1.02				
Quality of life					–4.93	–10.68 to 0.83	0.66	0.43 to 1.02			–4.35	–10.97 to 2.28
Vitality												
Middle vs. lowest tertile			–0.74	–1.85 to 0.37			1.22	0.57 to 2.64			0.61	–9.90 to 11.13
Highest vs. lowest tertile			0.13	–1.19 to 1.45			2.45	1.15 to 5.23			10.35	–2.32 to 23.02
Coexisting musculoskeletal comp.												
Lower extr.comp. vs only hip comp.	0.51	0.11 to 2.30	–1.77	–3.78 to 0.25	–14.83	–31.59 to 1.93	1.04	0.38 to 2.85	–0.12	–2.43 to 2.19	–5.96	–24.74 to 12.83
Lower and upper vs. only hip comp	0.52	0.24 to 1.10	0.58	–1.77 to 0.62	–4.65	–14.64 to 5.34	0.52	0.27 to 1.01	–0.95	–2.30 to 0.39	–10.37	–21.35 to 0.62
Comorbidity	0.60	0.28 to 1.29			–7.74	–15.69 to 0.21						
Extraindividual												
ACSM position stand							1.83	0.81 to 4.14				
Norm for healthy activity			0.93	–0.07 to 1.92			1.61	0.86 to 2.99	0.99	–0.12 to 2.09		
Social support			–0.05	–0.11 to 0.01								

Note. HR = hazard ratio; CI = confidence interval; b = regression coefficient; BMI = body mass index; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index; PCI = Pain Coping Inventory; extr = extremities; comp. = complaints; ACSM = American College of Sports Medicine.

[a]HR < 1.00 = a reduced probability of recovery compared to the reference group; HR > 1.00 = an increased probability of recovery compared to the reference group. [b]b > 0 = greater reduction in pain or more improvement in functioning; b < 0 = less reduction in pain or less improvement in functioning.

Transformation, and no comorbidity. The multiple regression model explained 49% of the variance of change in functioning.

Prognostic Indicators of Outcome After 12 Months

Table 3 demonstrates the variables which were significantly related to recovery, a change in pain intensity, or a change in functioning after 12 months. A shorter duration of the hip complaint, the perceived cause of the complaint was overload during sport, and a higher score on the vitality scale at baseline, were associated with a higher probability of recovery after 12 months. The area under the ROC curve was 0.89 (95% confidence interval: 0.83–0.95). The following variables were related with more reduction in pain intensity after 12 months: The patient was working, had no history of hip complaints, had more severe hip complaints and more pain at baseline, and met the norm for healthy activity. The multiple regression model explained 46% of the variance of change in pain intensity. More improvement in functioning after 12 months was correlated with the following variables: The patient was not smoking, was working, had a shorter duration of the hip complaint, had more pain during baseline, showed worse WOMAC functioning scores at baseline, and scored higher on the vitality scale at baseline. The multiple regression model explained 54% of the variance of change in functioning.

DISCUSSION

We evaluated the course of new hip complaints in 139 patients in general practice. Only 24% of the patients indicated that they were recovered after 3 months. This proportion increased to 37% after 12 months. Despite this low recovery rate, significant mean improvements in pain intensity and functioning were found. A mean reduction in pain intensity of 41% and a mean improvement in functioning of 35% were found after 12 months.

Different prognostic indicators were found to be associated with perceived recovery, changes in pain intensity, and changes in functioning. Similar to a another study from our Institute in patients with back pain (33), and similar to our previous study in patients with knee complaints (34), we found no prognostic indicator to be independently associated with a better prognosis for all outcome measures after both 3 and 12 months. Possibly the mechanisms underlying the course of pain and the course of physical functioning are influenced by different variables.

Regarding sociodemographic variables, smoking was associated with worse outcomes. Previous research has found smoking to be correlated with lower physical functioning in low back pain patients (35). Other studies have indicated an association of smoking with musculoskeletal pain (36–38). Several studies have tried to explain this relationship. One possibility concerns a pharmacological effect of tobacco smoke. Smoking tobacco might cause general damage to musculoskeletal tissues (37,39,40). Another possibility is that people who smoke are more likely to report pain and disability (38). A recent community survey aims in the same direction: adolescent smokers had multiple somatic symptoms, poorer self-reported health, and greater use of health care services than did age-matched nonsmokers (41).

Regarding characteristics of the complaint, a longer duration, a history of previous hip complaints, and a more severe complaint were associated with a worse prognosis. These findings may be explained by the fact that these patients may suffer from a chronic condition such as osteoarthritis. These complaints have been found to account for a poor prognosis (42,43). Unfortunately, in our study, we were unable to collect reliable information on the diagnoses made by the GP, which makes it difficult to test this hypothesis.

Some perceived causes of the complaint turned out to be significant prognostic indicators of favorable outcomes. Patients who thought that the cause of their complaint was overload showed better outcomes. The fact that these patients were able to avoid the activities that they thought had caused their complaints may explain their better outcome.

In our study, several pain coping strategies turned out to be significant prognostic indicators. A lower probability of recovery after 3 months was found for patients who scored highest on the (passive) pain coping strategy "worrying" (e.g., "I think that the pain will get worse"). This finding is in agreement with previous studies, which found that passive coping strategies predict a poor outcome (44–46). Furthermore, a study among patients with rheumatoid arthritis found passive coping strategies to correlate with depression and higher levels of pain, which may indicate that both passive processes (coping) and negative processes (depression) may result in higher levels of pain (47). In addition, worrying may also be conceptualized as entrapping the patient. Attention to pain may increase pain experiences, which can lead to catastrophizing and to avoidance of situations and activities (23). Pain catastrophizing, the tendency to focus on pain and negatively evaluate one's ability to deal with pain, is an important predictor of pain (48–50).

Patients who were more vital and met the norm for healthy activity showed a better prognosis. These two prognostic indicators may simply be considered as markers of patients who are in a better health state, and therefore, have a better probability of a better outcome. People who are more healthy may have a more active lifestyle, which has previously been shown to be associated with less physical disability in community living elderly (51). Vitality and the norm for healthy activity may be intervenable prognostic indicators. It might be interesting to investigate whether promoting a physically active lifestyle could prevent persistent pain and functional problems in patients with hip complaints. Previous research has shown that offering a primary care-based physical activity advice did appear to positively influence the intention to exercise in sedentary older patients with osteoarthritis (52). However, our results provide only preliminary information regarding a causal association between an active lifestyle and outcome of hip complaints, due to the observational design of our study. Investigating the effect of offering an intervention in primary care, aimed at promoting a physically active lifestyle, may provide further evidence regarding this hypothesis.

Our study has certain limitations. Many eligible patients did not participate in our study. The number of included patients per GP varied from 0 to 70. Thirty-seven GPs (38%) included no

patients at all. Based on data from the second Dutch National Survey of General Practice (NS2), we estimated that in the general practices that participated in the NS2, a maximum of 40% of the eligible patients participated in our study. However, we have no indications that selection bias has occurred because GPs indicated that the most important reasons for not including patients concerned lack of time or motivation to ask all patients during consultation hours (53).

If a selection bias did occur, we speculate that especially older patients with more chronic conditions have participated in our study. Younger patients with more acute hip complaints may have been missed because of two reasons. First, the GP may not have asked these patients because he or she expected that the patient would be recovered within a few days. Second, the patient may not have wanted to participate in the study because he or she may already have recovered from the complaint by the time the baseline questionnaire arrived. Because acute complaints in most patients have a better prognosis than chronic conditions (e.g., osteoarthritis), it may be more important to identify (intervenable) predictors of outcome in these more chronic complaints.

Some potential prognostic indicators may have been missed in our study. In the analyses, we did not include occupational factors. Several studies have found associations between occupational factors and the onset of hip complaints. Occupational physical activity, particularly the lifting of very heavy loads in the workplace at regular intervals, predisposes to hip osteoarthritis and hip pain in general (54–57). Furthermore, a recent review has described the role of jobs and occupational physical activities on the occurrence of osteoarthritis (58). We did not consider these factors in our analyses because 42% of the patients in our study were not working. The intention of our study was to develop models that could be applied to most patients in general practice. Including occupational factors would have created models that would not be relevant to nearly half of the patients seen by the GP.

Our study adds important information. First, using the results of our study, GPs can offer their patients more accurate information on their prognosis. A poor prognosis was seen for patients who reported previous hip complaints, patients who suffered from their complaint for a longer time period, and patients who had more severe complaints. Furthermore, two prognostic indicators were found that might be used by GPs in advising patients about how to deal with their hip complaints. Being vital and meeting the norm for healthy activity resulted in better outcomes both after 3 and 12 months. Promoting a physically active lifestyle might possibly improve the prognosis of patients with hip complaints.

This is the first study to investigate the prognosis of patients with a new episode of hip complaints in general practice. Among other prognostic indicators, our study included several psychosocial potential prognostic indicators. The results demonstrate that some of these psychosocial factors (e.g., pain coping) were shown to predict outcome after 3 or 12 months. Future research should aim at investigating the mechanisms that can underlay these associations.

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