Clear Associations Between Demographic and Psychosocial Factors and Health-related Quality of Life in Patients with Early Inflammatory Joint Complaints

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ABSTRACT. ***Objective***. To identify demographic and psychosocial characteristics associated with health-related quality of life (HRQOL) in patients with early inflammatory joint complaints.

Methods. In this cross-sectional study, patients had inflammatory joint complaints for less than 12 months. Data were collected on clinical characteristics, demographics, lifestyle, behavioral coping, perceived health control, and social support. HRQOL was assessed by 8 dimensions of the Medical Outcome Study Short Form-36 Health Survey. Multiple regression analysis was used to determine the associations between clinical, demographic, lifestyle, and psychosocial characteristics with HRQOL.

Results. In total, 359 patients were included, of which 24% were classified as RA, 34% as mono- or oligo-poly arthritis, and 42% as inflammatory joint complaints without clinical synovitis. Among all patients, the health dimensions physical function, physical role functioning, and bodily pain were most affected. The diagnostic group, erythrocyte sedimentation rate, disease duration, and comorbidity explained 4%–9% of the variance in HRQOL dimensions, whereas the combined demographic and psychosocial characteristics explained an additional 21%–29% of HRQOL. HRQOL was negatively associated with younger age, lower education, non-Dutch origin, passive behavioral coping with pain, lower perceived health control, and low social support. Passive behavioral coping with pain had the strongest association with HRQOL.

Conclusion. In patients with early inflammatory joint complaints, HRQOL was associated more strongly with personal characteristics than with clinical characteristics. From the time of onset of complaints onwards, physicians should take psychosocial factors and demographics into account to obtain an optimal disease outcome. (First Release Aug 1 2008; J Rheumatol 2008;35:1754–61)

Key Indexing Terms:
QUALITY OF LIFE   EARLY ARTHRITIS   PSYCHOSOCIAL FACTORS   COPING

Patients with inflammatory joint complaints often present with comparable clinical signs and symptoms, despite different underlying pathologies and prognosis. Health-related quality of life (HRQOL) and restrictions in function differ among patients from disease onset onwards[1]. Because clinical characteristics that are targeted by physicians during treatment cannot fully explain differences in HRQOL[2,3], other characteristics must play a role. Since one of the main goals of treatment is to maintain an optimal HRQOL[4], insight into these characteristics is important for disease management. According to the model of the International Classification of Function, Disability and Health (ICF), HRQOL is influenced by both clinical characteristics and personal and environmental factors. Personal factors include demographic, lifestyle, and psychosocial characteristics[5]. In patients with longstanding RA, reduced health status has been related to older age, female sex, lower education level[6], low socioeconomic status[7], unemployment[6,7], and a variety of psychosocial characteristics including low perceived health control[8], low self-efficacy in handling the disease[8,9], passive behavioral coping[10,11], and low social support[10,12]. Since most research has studied patients with longstanding rheumatoid arthritis (RA), it is largely unknown whether these demographic and psychosocial characteristics already exert their influence on health during the early phase of inflammatory joint complaints. Moreover, it seems that the demographic and psychosocial factors related to reduced health in patients with RA are generic factors related to health in a broad spectrum of rheumatic diseases[8,13]. However, similarities in the association between demo-

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graphic and psychosocial characteristics, and health among diagnostic groups, have been studied insufficiently.

Better insight into the demographic and psychosocial characteristics determining HRQOL in patients with early inflammatory joint complaints can influence the choice of treatment and possibly improve prognosis. Of particular interest are characteristics that are amenable to change. In addition, insight into the personal characteristics determining HRQOL may provide knowledge about which patients seek medical care in an early phase of complaints[14]. The purpose of this cross-sectional study was to identify demographic and psychosocial characteristics associated with HRQOL in patients with early inflammatory joint complaints.

MATERIALS AND METHODS

Study population. Our cross-sectional study presents the first baseline assessments of the Rotterdam Early Arthritis CoHort (REACH). REACH is an ongoing inception cohort study with 4 years of followup. REACH aims to study the etiopathogenesis, diagnostic strategies, and outcome of patients with inflammatory joint complaints of less than 12 months' duration. General practitioners and rheumatologists (1 university hospital, 2 general hospitals) in the greater area of Rotterdam invited patients to participate in REACH from July 2004 onwards. Data collection includes a large array of detailed medical examinations and questionnaires. When patients enter the study, they can choose to provide only limited medical data and/or self-reported questionnaires. For the present study, data were available for patients who were sent by general practitioners or rheumatologists for inclusion in this study up to July 2006. This time period was chosen to ensure followup studies would include the same study population.

General practitioners selected patients with arthritis in at least one joint or patients experiencing complaints in at least 2 joints without synovitis. The general practitioners ascertained that complaints existed for less than 12 months and were not due to trauma/mechanical problems. In addition, subjects had to be older than age 16 years. During an interview by telephone and subsequent medical examination by a rheumatologist, the inclusion criteria were verified. Patients were included if (1) joint complaints existed for less than 12 months with no requirement of a minimum duration; and (2) arthritis in at least one joint or complaints in at least 2 joints in combination with at least 2 of the following criteria ascertained during medical examination by a member of the REACH team: morning stiffness longer than 1 hour, bilateral compression pain in metacarpophalangeal or metatarsophalangeal, symmetrical presentation, positive family history, non-fitting shoes, non-fitting rings, "pins and needles" in fingers, or unexplained fatigue for less than 1 year; and (3) complaints predominantly present in the morning and at night that improve with movement. Patients were excluded if (1) complaints were due to trauma/mechanical problems, (2) age was under 16 years, (3) no written communication was possible in Dutch, or (4) a prior diagnosis of RA, ankylosing spondylitis, Sjögren's syndrome, systemic lupus erythematosus or juvenile arthritis had been made by a rheumatologist before inclusion in this study.

For patients visiting rheumatologists directly, a similar verification procedure was applied. For all patients enrolled through general practitioners or rheumatologists, a rheumatologist set the diagnosis.

At the end of July 2006, notification to 586 patients was given by general practitioners (n = 251) and rheumatologists (n = 335) (Figure 1). In total, 166 patients did not fulfill inclusion criteria during the interview by telephone (n = 54) or the medical examination (n = 68), or were lost before actual inclusion (n = 44). Patients lost before actual inclusion were significantly more often male compared to participants (39% vs 27% male), but no differences in age existed. After inclusion, 61 out of 420 patients (15%) were excluded from the current study due to incomplete data collection (5%, n = 19) or as a result of the patient's choice at entry to the study to provide only limited medical data and/or questionnaires (10%, n = 42). The age and sex of these patients was not significantly different from the study population. Therefore, 359 patients were eligible. This study was approved by the ethics committees of the 3 participating hospitals. All patients gave written informed consent.

Measurements

Clinical characteristics. Patients with inflammatory joint complaints were classified into 3 mutually exclusive diagnostic groups based on the diagnosis made by a rheumatologist: (1) definite or probable RA, (2) specified or nonspecified mono- or oligo/poly- arthritis, non-RA, and (3) inflammatory joint complaints without apparent synovitis. Swollen joint count (SJC; 44 joints) was assessed and categorized into no synovitis, 1–2 swollen joints, and 3 or more swollen joints. Since diagnostic group and SJC were strongly related (r = 0.66), only diagnostic group was included in the statistical analysis. Erythrocyte sedimentation rate (ESR, mm/h) was measured and classified into low (< 10 mm/h), intermediate (10–25 mm/h), and high (> 25 mm/h) on the basis of tertile scores. ESR values were regarded as absent if measured more than 2 weeks before/after physical examination (n = 39). The duration of inflammatory complaints was defined as the period between symptom onset and medical examination. Based on the median number of weeks since complaint onset, disease duration was classified as short or long. A broad range of comorbidities was ascertained, including lung disease, cardiovascular diseases, diabetes mellitus, cancer, gastrointestinal diseases, kidney diseases, diseases of the gall bladder and liver, diseases of the thyroid gland, neurological diseases, and psychiatric disease. If one or more comorbidities existed, patients were classified as having a comorbid condition (yes/no).

Demographic characteristics and lifestyle. Patients were questioned about their age, sex, and ethnicity. Ethnicity was defined by country of birth of the mother if both parents were born abroad or by country of birth of the parent that was born abroad[15]. Two categories were made, e.g., Dutch citizens (no parent born abroad) and non-Dutch citizens (at least one parent born abroad). Education according to the highest level attained was categorized as low (≤ 9 yrs: primary school, lower and intermediate secondary schooling or lower vocational training), intermediate (10-14 yrs: higher secondary schooling or intermediate vocational training), and high (≥ 15 years: higher vocational training or university). Employment status was defined as having paid employment (yes/no). Marital status was ascertained, and patients were classified as living alone or living with others.

Body mass index was calculated by weight in kilograms divided by the square of the height in meters and categorized into normal (< 25 kg/m^2), overweight (25–30 kg/m^2), and obese (> 30 kg/m^2). Smoking was expressed by current smoking status (yes/no).

Psychosocial characteristics. Behavioral coping was assessed by 2 scales of the Coping of Rheumatic Stressors (CORS) questionnaire. The scale "decreasing activities to cope with pain" was measured by 8 items on a 4-point scale (seldom or never, sometimes, often, very often) and similarly the scale "pacing to cope with limitations" was measured by 10 items. Sum scores were computed that ranged from 8–32 and 10–40, respectively. A higher sum score indicates more frequent use of the coping strategy. Both scales have good internal consistency and high test-retest reliability[16-18]. In our present study, Cronbach's alpha for decreasing activity to cope with pain was 0.86, and Cronbach's alpha for pacing was 0.92. Since both scales were highly correlated (r = 0.77), only "decreasing activities to cope with pain" was included in the statistical analysis as it was considered to be most relevant in patients with early joint complaints[11,17].

Perceived control over health outcomes was measured by the Multidimensional Health Locus of Control Questionnaire (MHLC). The MHLC assesses 3 different dimensions of perceived health control by means of 3 scales (Cronbach's alpha 0.68 to 0.78). The "internal" scale reflects the belief that people are personally responsible for their own health, the "physician" scale reflects that a physician is responsible for one's health, and the "chance" scale reflects the belief that health depends
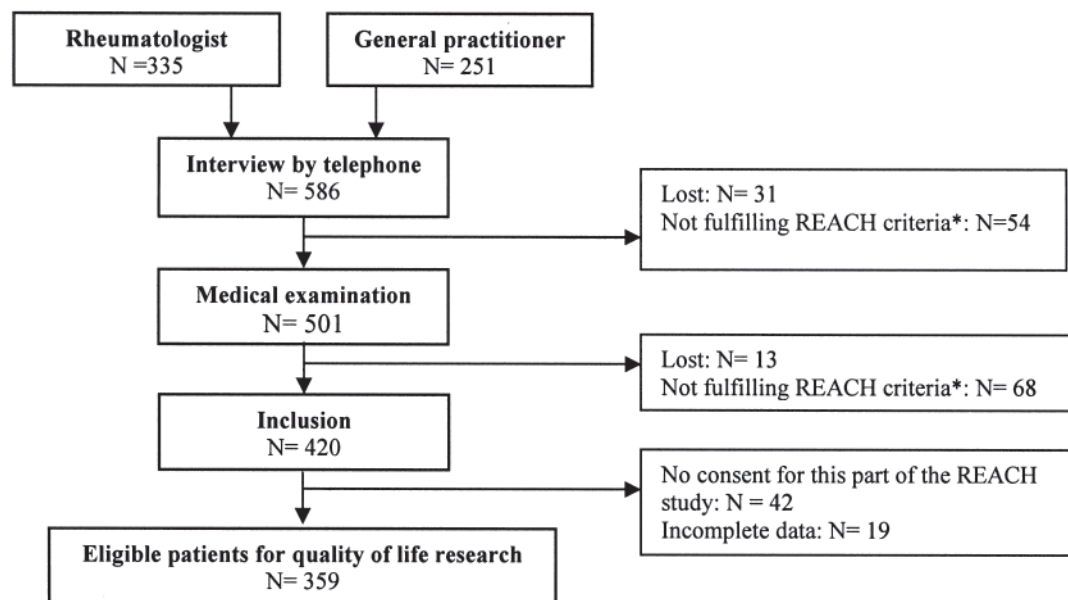
Figure 1. Inclusion of patients with early inflammatory joint complaints. *Patients were included in REACH if (1) joint complaints existed for less than 12 months, and (2) arthritis in at least one joint or complaints in at least 2 joints in combination with other factors indicating inflammatory complaints was ascertained (see text).

on chance, luck, or fate. Each scale contains 6 statements with answers on a 6-point scale (strongly disagree to strongly agree)[19,20]. The subscale scores range from 6 to 36, with a higher score indicating that a patient's belief is stronger in the particular health locus of control. The scales are not opposite ends of the same spectrum, and it is possible to have, for example, both internal and physician beliefs about health status at the same time. In this study, correlations among the subscales were low (r = 0.01–0.33), and Cronbach's alpha was 0.49 to 0.76.

Social support was assessed by a subscale of the Inventory for Social Support (ISB), which is part of the Impact of Rheumatic Diseases on General Health and Lifestyle questionnaire. The subscale reflects the perceived availability of emotional and instrumental support and has a documented reliability of Cronbach's alpha of 0.88[10,21]. The scale consists of 5 items with answers on a 4-point scale (almost never, sometimes, regularly, often) and the sum score ranges from 5 to 20, with higher scores indicating that more social support is experienced (Cronbach's alpha 0.90). Due to the highly skewed distribution of this scale, the sum score was categorized into 2 categories based on the median score (low/high).

The correlations among the psychosocial factors reducing activity in order to cope with pain, perceived health control, and social support were low (Spearman r = 0.00 to 0.35).

Health-related quality of life. HRQOL was assessed by the Medical Outcome Study Short Form-36 Health Survey (SF-36). The SF-36 is a generic 36-item questionnaire covering 8 dimensions: physical functioning (PF), physical role functioning (PR), bodily pain (BP), general health (GH), vitality (VI), social functioning (SF), and mental health (MH)[22,23]. From the 8 separate dimensions of the SF-36, component summary scores were calculated to provide a global measure of physical (PCS) and mental (MCS) functioning. The 8 dimensions and 2 summary scores may range from 0 to 100, and a higher score indicates a better HRQOL. In order to evaluate the HRQOL among patients in the study population, a comparison was made with a random sample from the Dutch general population[24]. Due to a strong ceiling effect, the dimensions emotional role functioning and physical role functioning were not included in the statistical analysis.

Statistical analysis. Differences between continuous variables were tested with the unpaired Student t-test and differences among frequencies with the chi-square test. Associations between continuous variables and between

variables on an ordinal scale were studied with, respectively, Pearson correlation and Spearman rank correlation coefficient. The level of statistical significance was defined as $p \leq 0.05$. The internal consistency of measurement scales was expressed by Cronbach's alpha.

Multiple linear regression analysis was conducted to determine the associations between clinical, demographic, lifestyle, and psychosocial characteristics, with 6 subscales of the SF-36 and the 2 component summary scores. The following procedure was applied to identify characteristics associated with each scale of the SF-36. First, 6 blocks of interrelated variables were defined: (1) the demographic characteristics age, sex, and ethnicity; (2) education and employment status; (3) clinical characteristic diagnostic group, ESR, duration of complaints, and comorbidity; (4) lifestyle factors smoking and body mass index; (5) behavioral coping with pain and perceived health control; and (6) social support and marital status. The analysis started with multivariate regression models within each block to determine which independent variables in each block of interrelated determinants were of interest to consider in the final model. Variables with a p value ≤ 0.20 were selected for further investigation. Subsequently, starting with the variables selected in the previous step, final multivariate regression models were constructed. In the final regression models with scales of the SF-36 as dependent variables, independent variables with a p value ≤ 0.05 for at least one scale of the SF-36 were retained in all models, as well as age and sex by default. In order to compare the influence of variables with a different scale, standardized regression coefficients were also calculated, expressing the influence of a shift of one standard deviation in the scale of the variables on the outcome of interest.

All statistical analyses were performed with the statistical package SPSS 11.0 for Windows.

RESULTS

Table 1 describes the characteristics of 359 patients with early inflammatory joint complaints. About 24% of the study population was diagnosed as RA (n = 86) and 35% (n = 124) was classified as (non-RA) arthritis. In 39 out of 124 patients (31%) with non-RA arthritis, monoarthritis was found, in 62 patients (50%) oligoarthritis, and in 23 patients

Table 1. Characteristics of patients with early inflammatory joint complaints (n = 359).

Characteristics	Rheumatoid Arthritis (n = 86)	(Non-RA) Arthritis, Specified and Non-Specified (n = 124)	Inflammatory Joint Complaints without Clinical Synovitis (n = 149)
Clinical			
Duration of complaints, weeks, median (IQR)	16 (17)	11 (18)	18 (20)
Swollen joint count, 44 joints, median (IQR)	4.0 (6.5)	2.0 (3.0)	0 (0)
ESR, mm/h, median (IQR)	25 (27)	22 (30)	8 (10)
Comorbidity, %	49	44	54
Demography			
Age, yrs, mean (SD)	53 (14)	50 (15)	48 (13)
Female, %	72	57	86
Non-Dutch citizens, %	22	17	19
Education, %			
Low	58	56	52
Intermediate	27	33	27
High	15	11	21
Paid employment, %	56	59	60
Marital status, % living alone	13	20	14
Lifestyle			
Smoking, %	30	28	28
BMI			
Normal (< 25 kg/m^2), %	41	35	41
Overweight (25–30 kg/m^2), %	36	49	38
Obese (> 30 kg/m^2), %	23	16	21
Psychosocial factors			
Decreasing activities to cope with pain (8–32), mean (SD)	15.8 (5.0)	15.7 (4.7)	15.0 (4.6)
Pacing to cope with limitations (10–40), mean (SD)	22.8 (7.1)	22.3 (6.7)	20.5 (6.5)
Perceived health control, mean (SD)			
Internal (6–36)	20.1 (4.5)	20.8 (5.0)	19.9 (5.1)
Physician (6–36)	20.7 (4.1)	19.8 (4.1)	19.1 (3.9)
Chance (6–36)	20.0 (4.6)	19.7 (5.5)	20.1 (5.5)
Social support (5–20) median (IQR)	17.0 (8.0)	17.5 (6.5)	17.0 (7.0)
Health-related quality of life (0–100) mean (SD)			
Physical functioning	56 (24)	60 (25)	65 (21)
Physical role	28 (36)	39 (41)	40 (40)
Bodily pain	39 (19)	44 (22)	47 (19)
General health	53 (18)	60 (19)	54 (18)
Vitality	56 (20)	57 (20)	54 (20)
Emotional role	63 (43)	72 (42)	72 (41)
Social functioning	70 (26)	70 (27)	73 (23)
Mental health	71 (19)	71 (24)	70 (18)
Physical component summary score	33 (9)	36 (10)	37 (9)
Mental component summary score	51 (12)	51 (11)	50 (11)

ESR: erythrocyte sedimentation rate; BMI: body mass index; IQR: interquartile range.

(19%) polyarthritis. Patients classified as having inflammatory joint complaints without clinical synovitis (n = 149) were diagnosed with arthralgia/myalgia (n = 49), inflammatory joint complaints without clinical synovitis, without further specification (n = 47), osteoarthritis (n = 37), and others (n = 16). Diagnostic group was strongly associated with swollen joint count (r = 0.66). At least one comorbidity was present in 50% of the patients. Cardiovascular (24%) and respiratory disease (11%) were the most prevalent.

Figure 2 presents the scores on the subscales of the SF-36. Compared to the Dutch reference population, patients experienced notably worse physical function, physical role functioning, and bodily pain. For physical role functioning, 44% of the patients reported the minimum score of 0, whereas 61% of the patients reported the maximum score of 100 for emotional role functioning. The interrelations among the subscales physical functioning, pain, general health, vitality, social functioning, and mental health were 0.30 to 0.62, with the lowest association between bodily pain and mental health (r = 0.30) and the highest association between vitality and social functioning (r = 0.62). The correlation between physical functioning and bodily pain was 0.59.

In Table 2 the associations of the SF-36 with blocks of interrelated clinical, demographic, lifestyle, and psychoso-
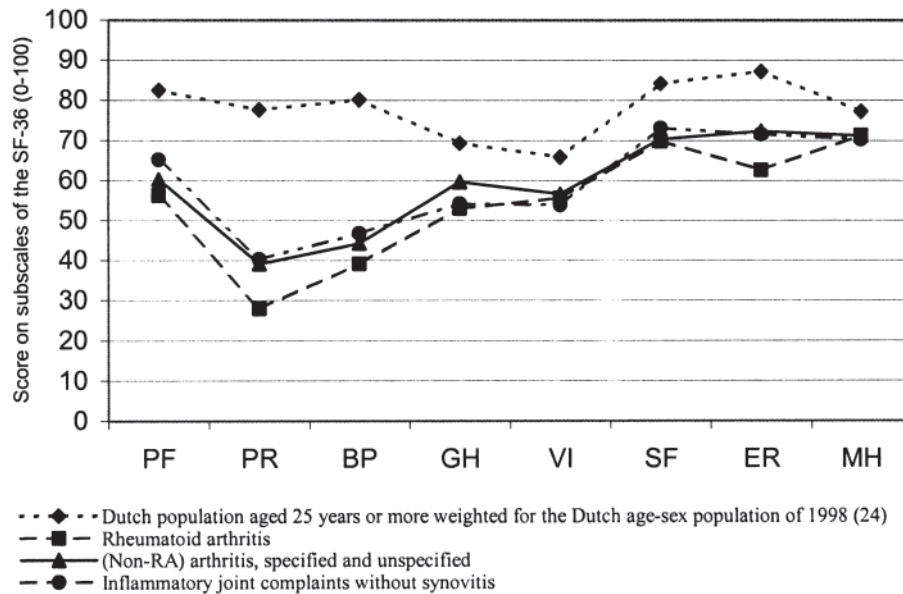
Figure 2. Health-related quality of life of patients with early inflammatory joint complaints as measured by the SF-36 components physical functioning (PF), physical role functioning (PR), bodily pain (BP), general health (GH), vitality (VI), social functioning (SF), emotional role functioning (ER), and mental health (MH).

Table 2. The associations within groups of clinical, demographic, lifestyle, and psychosocial characteristics with scales of the SF-36 in multivariate linear regression analyses in patients with early inflammatory joint complaints.

Characteristics	PF (0–100) ß	BP (0–100) ß	GH (0–100) ß	VI (0–100) ß	SF (0–100) ß	MH (0–100) ß
RA vs IJC without clinical synovitis	–3.32	–3.51	0.06	3.90	1.41	2.34
(Non-RA) arthritis vs IJC without clinical synovitis	0.32	1.39	**6.97***	**6.20***	1.62	2.12
Intermediate ESR (10–25 mm/h) vs low ESR (< 10)	–5.39**	–5.29**	0.12	2.01	1.23	3.64**
High ESR (> 25 mm/h) vs low ESR (< 10)	**–15.7***	**–9.28***	–5.12**	–4.63**	**–7.90***	–0.42
Duration of complaints (long vs short)	1.21	**7.00***	0.46	3.13**	4.39**	3.30**
Comorbidity	–0.67	–1.58	**–6.17***	–1.77	–2.97	**–4.92***
Age (yrs)	–0.10	–0.01	0.04	**0.26***	0.13**	0.08
Sex (male vs female)	–0.51	0.34	1.16	4.00**	–1.49	–0.61
Ethnicity (non-Dutch vs Dutch citizens)	**–8.49***	**–6.03***	**–6.10***	**–7.94***	**–13.8***	**–10.2***
Intermediate vs low education level	3.29	2.47	–2.47	–2.40	0.21	–0.80
High vs low education level	**9.79***	**10.0***	1.64	**6.82***	2.05	3.18
Employment	2.87	0.61	**4.14***	–2.22	2.19	1.20
Smoking	–1.46	0.06	0.29	–0.78	–0.79	0.11
Overweight vs normal	–2.11	0.13	1.64	0.82	–1.44	0.00
Obese vs normal	–5.29**	–2.30	–2.95	–1.93	0.79	2.21
Decreasing activity to cope with pain (8–32)	**–2.59***	**–2.08***	**–1.21***	**–1.91***	**–2.65***	**–0.94***
Internal perceived health control (6–36)	0.28	0.21	**0.69***	0.13	0.20	0.07
Physician perceived health control (6–36)	–0.54**	–0.06	**–0.71***	0.33	–0.34	**–0.75***
Chance perceived health control (6–36)	–0.32**	**–0.46***	**–0.58***	–0.07	–0.36**	–0.22
Marital status (alone vs with others)	–1.35	–0.47	–2.88	–4.06**	–1.61	0.41
Social support (high vs low)	4.16**	0.19	**5.19***	**7.27***	**7.25***	**10.1***

* $p \le 0.05$; ** $p \le 0.20$. PF: physical functioning, BP: bodily pain, GH: general health, VI: vitality, SF: social functioning, MH: mental health; IJC: inflammatory joint complaints; ESR: erythrocyte sedimentation rate.

cial characteristics are given. Physical function was 15.7 points worse in patients with high levels of ESR, and score for bodily pain was 9.3 points worse. In all subscales of the SF-36, significant worse HRQOL was reported by patients with a non-Dutch origin (6.0 to 13.8 points lower score) and by patients with a greater decrease in activity to cope with pain. The following characteristics were not associated with HRQOL (p > 0.20): smoking, obesity/overweight, and marital status (Table 2).

In the final multivariate linear regression analysis, diagnostic group, ESR, disease duration, and comorbidity together explained 4%–9% of the variance in the subscales of the SF-36, whereas adding demographic and psychosocial characteristics to the model increased the explained variance with 21%–29%, to the total explained variance in HRQOL of 25% to 36% (Table 3). For the physical (PCS) and mental (MCS) component summary scores, clinical factors explained, respectively, 11% and 5% of the variance, while demographic and psychosocial factors explained an additional 28% and 17% of the variance in HRQOL.

Table 4 shows that the score on the dimensions physical functioning, pain, general health, vitality, social functioning, and mental health decreased by 0.8 to 2.5 points, with an increase of one unit in the coping style "decreasing activity to cope with pain." Adjusted for other factors, an increase in the score on this coping style of one standard deviation (in this study population equal to 4.7 points) was associated with an 11.6-point worse score for physical functioning and a 9.6-point worse score for bodily pain. For several dimensions of HRQOL, younger age, non-Dutch origin, low education level, lower perceived health control, and low social support were also associated with poor HRQOL (Table 4). A worse PCS score was significantly associated with intermediate or high ESR levels, greater decrease in activity to cope with pain, and more attributing health to chance. A lower MCS score was associated with high ESR levels, greater decrease in activity in order to cope with pain, and low social support.

When interaction terms were added to the final multivariate models, observed associations between education, behavioral coping, and social support and HRQOL did not differ significantly among diagnostic groups or among patients with different ESR levels. Moreover, similar results were found when RA patients were compared to both other diagnostic groups, or when swollen joint count instead of diagnostic group was included in the analysis. The number of comorbidities was significantly associated only with the subscale general health, with 2 or more comorbidities being associated with worse general health than one or no comorbidity.

DISCUSSION

HRQOL among patients with early inflammatory joint complaints was strongly associated with demographic and psychosocial characteristics, and to a lesser extent with clinical characteristics. Diagnostic group, ESR, disease duration, and comorbidity explained 4%–9% of the variance in HRQOL dimensions, whereas the combined demographic and psychosocial characteristics explained an additional 21%–29%. In addition to well-know factors such as age, ethnicity, and education, we found that behavioral coping, perceived health control, and social support were related with health.

Patients seeking care with early inflammatory joint complaints reported notably reduced physical function, reduced role functioning due to physical problems, and increased pain compared to the reference population, irrespective of their specific diagnosis. The pattern in scores on the SF-36 resembled the pattern in restrictions generally found in patients with chronic rheumatic diseases[24-26]. Within this pattern in HRQOL, the differences among patients in the extent to which complaints intruded upon health were more strongly associated with personal factors than with clinical factors. This aligns well with the biopsychosocial model[27]. The personal factors related to health in this study population have previously been described in patients with various chronic rheumatic conditions[6,8,13,26]. Therefore, our study extends these previous findings by showing that in an early stage of disease, well-known demographic factors and behavioral coping with pain, perceived health control, and social support already are more strongly related to HRQOL than clinical factors. In addition, the associations between

Table 3. Explained variance (R^2) in scales of the SF-36 by groups of characteristics in multivariate linear regression analysis in patients with early inflammatory joint complaints. Values are percentages.

Characteristics	PF R^2	BP R^2	GH R^2	VI R^2	SF R^2	MH R^2
Clinical (diagnostic group, ESR, disease duration, comorbidity), %	9	9	7	4	4	4
Clinical + demographic (+ age, sex, ethnicity, education), %	11	13	11	12	9	9
Clinical + demographic + psychosocial factors (+ decreasing activity to cope with pain, perceived health control, social support), %	34	36	30	31	33	25

PF: physical functioning, BP: bodily pain, GH: general health, VI: vitality, SF: social functioning, MH: mental health.

Table 4. The influence of clinical, demographic, and psychosocial characteristics on scales of the SF-36 in multivariate linear regression analyses in patients with early inflammatory joint complaints.

Characteristics	PF (0–100) ß	BP (0–100) ß	GH (0–100) ß	VI (0–100) ß	SF (0–100) ß	MH (0–100) ß
Intercept	101.70	68.44	75.62	50.73	107.17	85.55
Clinical						
Diagnosis						
RA vs IJC without clinical synovitis	–3.90	–4.12	–0.59	2.55	1.23	2.43
(Non-RA) arthritis vs IJC without clinical synovitis	–0.95	0.92	**5.78***	**5.04***	1.06	1.04
ESR, mm/h						
Intermediate (10–25) vs low (< 10)	–3.89	–4.80	0.59	0.90	0.84	3.59
High (> 25) vs low (< 10)	**–7.94***	–3.60	–2.10	–2.59	–1.74	2.11
Duration of complaints (long vs short)	0.01	**6.35***	0.39	3.08	3.37	2.25
Comorbidity (yes vs no)	3.23	0.89	**–5.56***	–1.60	–0.54	–3.25
Demography						
Age (yrs)	0.06	0.09	**0.25***	**0.29***	**0.21***	**0.19***
Sex (male vs female)	–0.78	–1.78	–0.87	3.14	–2.94	–0.26
Ethnicity (non-Dutch vs Dutch citizens)	–2.63	–1.56	–0.06	–2.56	**–7.02***	**–6.80***
Education level						
Intermediate vs low	2.28	1.14	–3.78	–1.17	0.40	0.60
High vs low	4.11	**7.50***	–1.66	4.26	–0.97	1.66
Psychosocial factors						
Decreasing activities to cope with pain (8–32)	**–2.44***	**–2.03***	**–0.93***	**–1.71***	**–2.46***	**–0.76***
Perceived health control						
Internal (6–36)	0.37	0.24	**0.68***	0.09	0.22	0.11
Physician (6–36)	–0.26	0.41	**–0.92***	0.27	–0.27	**–0.82***
Chance (6–36)	–0.34	**–0.54***	**–0.60***	–0.05	–0.39	–0.25
Social support (high vs low)	3.09	0.46	**4.02***	**5.83***	**6.56***	**8.99***

* p ≤ 0.05. PF: physical functioning, BP: bodily pain, GH: general health, VI: vitality, SF: social functioning, MH: mental health.

psychosocial and demographic characteristics and health seem to be generic across different diagnostic groups, at least in an early phase of disease.

A similar pattern of associations between demographic and psychosocial factors and dimensions of the SF-36 was found for those SF-36 dimensions that were strongly related. Among the psychosocial factors, behavioral coping was a major influence. An increase of one standard deviation in the coping style of decreasing activities to cope with pain resulted in 10% more pain and a reduction of 12% in physical functioning. Behavioral coping is thought to be relatively stable over time, and may be independent of disease activity and duration[13]. In addition, passive behavioral coping with pain has been related to subsequent worse outcome in patients with RA[10,11,17]. It could therefore be hypothesized that it is more likely that passive behavioral coping has resulted in a reduced health than reduced health inducing a passive coping style. However, due to the cross-sectional design of our study, reversed directionality cannot be excluded and thus no assumption on causation can be made. In agreement with our findings for behavioral coping, more internal and less external perceived health control was related to better health. Previous studies have shown that low perceived health control and high helplessness feelings can unfavorably affect outcome in chronic rheumatic condi-

tions[8,28,29]. Moreover, in chronic pain patients, external attribution of health has been related to ineffective coping styles to control pain, and to avoiding increasing activity to cope with pain[30].

In our cross-sectional study, the baseline data of an ongoing inception cohort study, REACH, were used. Since the prevalence of inflammatory joint complaints in the general population is unknown, little insight exists in potential selection processes during referral of patients by physicians to this inception cohort study. If selection bias has occurred, it seems that physicians are more likely to have notified patients about REACH if patients reported serious complaints. Additional analysis showed that entering the study via notification by a general practitioner or a rheumatologist did not contribute to reported differences in health. Further, due to the response of 85% after inclusion, we are confident that a response bias has not influenced the results of this study to a large extent. Individuals' self-report tendencies may have influenced our findings, since both the psychosocial factors and HRQOL were self-reported measures. However, the correlations among the psychosocial factors behavioral coping, health locus of control, and social support were low. Further, these psychosocial factors did not have associations of similar magnitude across all dimensions of the SF-36. Therefore, we think that individuals'

self-report tendencies did not contribute markedly to an overestimation of the associations. The analyses we presented did not take physical health into account when characteristics related to the mental dimensions of HRQOL were studied, and vice versa. However, additional analysis showed that taking these constructs into account did not affect the essence of our findings.

To our knowledge, no study has described characteristics related to differences in HRQOL in patients with inflammatory joint complaints visiting primary care in an early phase of disease. The characteristics of our study population provided some insight into which patients seek medical care in an early phase of inflammatory joint complaints. Patients reported considerable pain and physical limitations, and it could be hypothesized that these complaints prompted medical care-seeking. In order to improve HRQOL, early medical treatment is needed. However, physicians should be aware that self-reported HRQOL is not only affected by clinical factors such as ESR and diagnosis. In a very early stage of disease, the valuation of health is already strongly related to demographic factors and psychosocial factors such as passive behavioral coping, perceived control over health, and social support. This implies that treatment may need to be tailored to these characteristics in order to obtain an optimal HRQOL in the early phase of inflammatory joint complaints.

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