EXTENDED REPORT

Quality of life and work in patients with rheumatoid arthritis and ankylosing spondylitis of working age

A M J Chorus, H S Miedema, A Boonen, Sj van der Linden

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See end of article for authors' affiliations

Correspondence to: A M J Chorus, MSc, TNO Prevention and Health, PO Box 2215, 2301 CE Leiden, The Netherlands; AMJ.Chorus@pg.tno.nl

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Objective: To investigate the relationship between work and quality of life (QOL) in patients with rheumatoid arthritis (RA) and ankylosing spondylitis (AS) aged 16–59.
Methods: 1056 patients with RA and 658 with AS were included in the study. Data were obtained by postal questionnaire, which included several generic and disease related QOL instruments. Separate dimensions and physical and mental summary scores from the SF-36 were compared. Stepwise multiple regression was performed to study the relationship between work and physical and mental health related QOL, including disease related factors, coping, and fatigue.
Results: Physical health related QOL was reported to be worse, and mental health related QOL better, in RA than in AS in people of working age. No differences between RA and AS were found in somatic pain, physical role functioning, social functioning, emotional role functioning, vitality, or general health perception; nor were there any significant differences in fatigue and behavioural coping styles. Work was positively associated with physical health related QOL in both groups and, after disease characteristics, was the most important determinant. No association was found with mental health related QOL.
Conclusions: Although physical health related QOL was worse in patients with RA, the impact on several dimensions of health related QOL in patients with RA and AS of working age under rheumatological care was comparable. Patients with RA and AS experienced similar limitations in physical role functioning, including work. Work is an important independent external determinant of physical health related QOL, but not of mental health related QOL.

Rheumatoid arthritis (RA) and ankylosing spondylitis (AS) are two common types of inflammatory rheumatic disease. In the Netherlands patients are usually referred to rheumatologists by general practitioners.[1] RA is characterised by chronic, symmetric, and erosive synovitis of peripheral joints. Any joint may be affected, but those most commonly involved are the metacarpophalangeal or proximal interphalangeal joints of the hand, and the metatarsophalangeal and proximal interphalangeal joints of the feet, wrists, knees, and elbows. The disease causes decreased hand function and decreased mobility. Onset of RA reaches a peak between the ages of 40 and 50 and it is two to three times more prevalent in women than in men.[2] AS predominantly affects the axial skeleton with sacroiliac joint involvement (sacroiliitis) as its hallmark, causing decreased spinal mobility. Onset is usually before the age of 40. Clinically, AS is three times more prevalent in men.

Daily pain, stiffness, fatigue, and physical disability are common features of both RA and AS.[3–5] These problems, and the way patients cope with them, can affect their quality of life (QOL).[2 6]. RA is traditionally considered to be a disease with a major impact on all aspects of QOL.[2] The burden of illness of AS is less well defined than for RA. It is often said that AS has a moderately severe impact on QOL because many patients maintain good functional ability, and most patients manage to remain in paid employment.[6–9] However, in a previous study we found that age and sex adjusted participation in the labour force was also reduced in AS compared with reference data from the general population of working age.[10] So work disability can be a major problem in both patients with RA and AS, with a potentially negative effect on wellbeing and QOL. Only one study makes a direct comparison of the consequences of RA and AS. That study found that groups of patients with RA and AS matched for age and sex had similar amounts of disability, pain, and reduced wellbeing. This contradicts the consensus view.[11] However, there was no assessment of the relationship between work and QOL.

Having a paid job can have positive effects on the wellbeing and QOL of people of working age.[12] Because both diseases tend to strike when people are of working age, it is expected that these positive effects also apply to patients with RA and AS. On the other hand, holding down a paid job may require a lot of energy from people with chronic disease, and this may have negative effects on health status. Research on rheumatic diseases has shown that health related QOL is influenced by the main disease disability pathway and factors external to this pathway, such as education and psychosocial characteristics.[7 13] However, the relative contribution of work to the QOL of patients with RA and AS is not known.

The objectives of this study were, therefore, to compare the QOL of patients with RA and AS of working age who were receiving rheumatological care, and to study the effect of work on the health related QOL in a multivariate context.

METHODS

Patient population

The present study was conducted in a Dutch nationwide group of 1056 patients with RA and 658 patients with AS aged 16–59 years, as diagnosed by a rheumatologist. Eligible patients were selected using the national Standardised

Abbreviations: ANCOVA, analysis of covariance; AS, ankylosing spondylitis; BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; CORS, Coping with Rheumatic Stressors; MCS, mental component summary; MFI, Multidimensional Fatigue Inventory; PCS, physical component summary; QOL, quality of life; RA, rheumatoid arthritis; RADAI, Rheumatoid Arthritis Disease Activity Index; SDR, Standardised Diagnosis Register of Rheumatic Diseases; SF-36, Short Form-36

Diagnosis Register of Rheumatic Diseases (SDR), a representative database with information about diagnoses of the patient population made by 80% of all rheumatologists in the Netherlands.[1] For each diagnosis group, recruitment and data collection were conducted separately, using different geographically representative samples of rheumatology practices throughout the Netherlands. In 1996 a random sample of patients with RA aged 16–59 was selected from 17 practices (52% of all practices participating in the SDR in 1996, accounting for 37% of all SDR rheumatologists, in other words 30% of all rheumatologists in the Netherlands). In 1997 a random sample of patients with AS aged 16–59 was selected from 15 practices (42% of all practices participating in the SDR in 1997, accounting for 34% of all SDR rheumatologists, in other words 27% of all rheumatologists in the Netherlands). All patients were contacted by their own rheumatologist, and 1056 patients with RA and 658 patients with AS (62% and 60% of the initial cohorts respectively) agreed to participate. All patients filled out a self administered questionnaire on demographics, work related characteristics, disease-specific and general health related instruments to assess QOL, coping, and fatigue. The design has also been described in detail elsewhere.[10 14]

Demographics, work, and disease related characteristics

The demographic variables were age, sex, and highest attained level of education (primary; secondary; higher vocational/university). Work was defined as having paid employment (yes/no). Disease related characteristics included were age at time of diagnosis, disease duration, comorbidity (at least one comorbid condition versus none), and a measure for disease activity. Disease activity was assessed by different validated disease-specific measures. The Rheumatoid Arthritis Disease Activity Index (RADAI) was used for patients with RA and the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) was used for patients with AS. [15 16] Both the RADAI and the BASDAI range from 0 to 10, and higher scores indicate more disease activity.

Quality of life

Information about health related QOL was obtained with a validated Dutch translation of the SF-36.[17] The SF-36 contains 36 items, organised into eight multi-item scales covering the dimensions physical functioning, physical role functioning, social functioning, emotional role functioning, mental health, vitality, bodily pain, and general health. One additional item pertains to health transition. On the basis of these separate subscales, component summary scores can be calculated to provide a global measure of physical (PCS) and mental functioning (MCS).[18 19] The scales and summary scores may vary from 0 to 100, with lower scores indicating a worse health status.

Coping

Coping styles were assessed with the Dutch validated Coping with Rheumatic Stressors (CORS) instrument.[20 21] The CORS measures eight coping styles for the most important stressors of inflammatory rheumatic diseases—namely, pain, limitations, and dependence. Three scales relate to pain: comforting cognitions (9 items), decreasing activities (8 items), and diverting attention (8 items). Three scales measure styles of coping with limitations: optimism (5 items), pacing—for example, adapting one's level of activity (10 items), and creative solution seeking (8 items). Two scales refer to dependence: making an effort to accept one's level of dependency (6 items) and showing consideration (7 items). For each item, patients report how often they made use of that particular coping effort on an interval scale ranging from 1 to 4. Higher scores indicate more frequent use.

Fatigue

The Multidimensional Fatigue Inventory (MFI) was used to assess fatigue. It measures five dimensions: general fatigue, physical fatigue, reduced motivation, reduced activity, and mental fatigue. The MFI has been validated and tested in previous studies of chronically ill people, including patients with AS.[22 23] Each dimension of the MFI has four items that have a positive or negative focus. Each item is scored on a five point scale ranging from ''yes, that is true'' to ''no, that is not true''. A summary score was calculated for each dimension, varying from 4 to 20. Higher scores indicate more fatigue.

Data analysis

Firstly, statistically significant differences in demographics, work related and disease related characteristics between both disease groups were examined. Because it is well known that age and sex differ significantly between RA and AS, all differences in demographics, work related variables, and disease related variables were controlled for age and sex. Continuous variables were subjected to an analysis of variance (ANCOVA). Nominal or ordinal data were submitted to logistic regression analysis.

Secondly, mean scores and standard deviations were calculated for the separate dimensions and the physical and mental component summary scores of the Short Form-36 (SF-36), for the different behavioural coping styles, and for the dimensions of fatigue for men and women for each disease sample. Differences between groups were tested using an analysis of variance, including age and educational level as covariates (ANCOVA). A Bonferroni correction was made to account for multiple group comparison ($k = 4$), using a significance level of $p = 0.05/4$.

Finally, a multiple stepwise regression analysis was conducted to investigate the relation between work and health related QOL in RA and AS in combination with demographics, disease related characteristics, coping styles, and fatigue. As outcome measures for QOL, we used the physical and the mental component summary scores of the SF-36 to reduce the number of statistical comparisons and therefore the role of chance. These summary scores have proved useful in most studies and better than the best SF-36 scale.[19] Independent variables in the regression analysis were introduced stepwise in five blocks of variables to test for mediation. In the first block, age in years, sex, and educational level (the three ordinal categories) were entered into the model. In the second block, employment (a paid job *v* no paid job) was added. In the third block, disease duration, disease activity, and comorbidity (one or more comorbid conditions *v* none) were included. In the fourth block, coping styles (continuous variables) were introduced. Finally, as advised by the developers of the instrument, the general fatigue dimension (continuous) of the MFI was added as an indicator of fatigue.[23]

To avoid multicollinearity in the model, in other words interrelatedness between the independent variables, we introduced a tolerance threshold of 0.6, meaning that a variable is included in the model if the variance shared by another independent variable is 40% or less.[24]

The change in the percentage of explained variance (incremental R^2) and the partial correlation coefficients after each step are reported as results of the regression analyses. A partial correlation is the correlation of the independent variable with the outcome (PCS or MCS) after correction for all the other independent variables in the model. The total R^2 is also reported. All statistical analyses were performed with the statistical package SPSS for Windows, release 11.0.1.

Table 1 Demographic characteristics of the patients with RA and AS

	RA	AS	p Values
Number of patients	1056	658	
Men* (%)	27.7	70.1	<0.001
Mean (SD) age* (years)	49.0 (8.3)	43.5 (9.4)	<0.001
Men	50.5 (7.5)	44.0 (9.3)	<0.001
Women	48.4 (8.4)	42.5 (9.5)	<0.001
Highest attained level of education, total† (%)			
Primary school	49.1	41.7	0.082
Secondary school	38.8	38.9	
High vocational school/university	12.1	19.4	
Highest attained level of education, men†:			
Primary school	52.7	40.7	0.018
Secondary school	34.5	36.7	
High vocational school/university	12.8	22.6	
Highest attained level of education, women†:			
Primary school	48.1	44.1	0.305
Secondary school	40.4	44.1	
High vocational school/university	11.9	11.8	
Paid employment† (%)	35.7	64.0	0.003
Men	56.7	70.7	0.157
Women	27.7	48.2	0.003
Work disability (fully or partially)† (%)	40.3	32.4	<0.001
Men	59.5	34.1	<0.001
Women	33.1	28.4	0.144
Mean (SD) age at diagnosis‡ (years)	37.2 (10.6)	31.3 (9.4)	<0.001
Men	39.6 (9.2)	31.2 (9.5)	<0.001
Women	36.3 (10.6)	31.4 (8.8)	0.001
Mean (SD) disease duration† (years)	11.9 (9.1)	12.3 (8.0)	<0.001
Men	11.1 (7.9)	12.8 (8.4)	<0.001
Women	12.3 (9.1)	11.0 (7.0)	0.320
Disease activity (RADAI, 0–10), mean (SD)	4.2 (2.2)		
Men	4.2 (2.2)		
Women	4.2 (2.1)		
Disease activity (BASDAI, 0–10), mean (SD)		3.9 (2.4)	
Men		3.7 (2.4)	
Women		4.4 (2.4)	
Comorbidity† (%)	47.4	40.1	0.316
Men	45.9	37.7	0.717
Women	47.9	45.7	0.203
Duration of morning stiffness (min), total† (%)			
0–14	26.6	36.1	<0.001
15–29	18.8	22.2	
30–59	26.0	24.8	
60–119	13.9	16.6	
⩾120	14.7	0.3	
Duration of morning stiffness (min), men† (%)			
0–14	24.8	36.0	<0.001
15–29	17.2	24.0	
30–59	23.7	24.7	
60–119	16.6	15.1	
⩾120	17.7	0.2	
Duration of morning stiffness (min), women† (%)			
0–14	27.3	36.3	0.001
15–29	19.4	17.9	
30–59	26.9	25.3	
60–119	12.9	20.0	
⩾120	13.6	0.5	

*Univariately tested; †multivariately tested to adjust for age and sex (if applicable); ‡multivariately tested to adjust for sex differences (if applicable).
Correlation between current age and age at diagnosis was 0.64.

RESULTS

Table 1 lists the demographic characteristics of the patients with RA and AS of working age. The age and sex distributions of the patients with RA and those with AS are significantly different. Slightly more than one quarter of the patients with RA and more than two thirds of the patients with AS were male. The mean age was 49.0 years for RA and 43.5 years for AS. Men and women with RA were significantly older than their AS counterparts. The educational level among male patients with RA was lower than among male patients with AS. Fewer patients with RA than patients with AS were in paid employment, especially women.

Mean age at diagnosis was 37.2 years for RA and 31.3 years for AS ($p<0.001$). The mean disease duration for men and women with RA was lower than for AS. In these working age groups, there was no significant difference in comorbidity between the samples as shown by the prevalence and mean number of comorbid conditions.

Table 2 presents mean scores and standard deviations for separate dimensions, together with summary scores for QOL questionnaires, various behavioural coping styles, and dimensions of fatigue and the results of the ANCOVA tests for differences between male and female patients separately controlled for age and educational level.

Overall, the physical component scores were more favourable in AS than in RA, merely because patients with RA reported more problems with physical functioning, such as running, climbing stairs, washing and dressing. Other components of physical health related QOL—physical role

Table 2 Quality of life, coping, and fatigue of male and female patients with RA and AS

	RA		AS		
	Men (n = 292)	Women (n = 764)	Men (n = 461)	Women (n = 197)	Test statistic (ANCOVA)
Quality of Life (SF-36, range 0–100), mean (SD)					
Physical functioning	52.7 (27.4)[2,3]	47.9 (26.3)[1,3,4]	67.8 (24.1)[1,2,4]	61.3 (23.1)[2,3]	F = 43.5; p<0.001
Physical role functioning	49.3 (42.9)[2]	42.9 (45.5)[1,3]	60.0 (41.5)[2]	51.4 (40.4)	F = 11.0; p<0.001
Social functioning	74.7 (24.2)[2]	71.6 (25.2)[1,3]	76.3 (23.8)[2]	72.7 (25.1)	F = 4.0; p = 0.008
Emotional role functioning	76.7 (38.9)	73.8 (42.9)[3]	81.2 (33.6)[2]	75.2 (38.0)	F = 2.8; p = 0.038
Mental health	74.3 (17.4)[2,3,4]	71.4 (19.2)[1]	72.4 (18.2)[1]	70.5 (17.7)[1]	F = 7.9; p<0.001
Vitality	56.1 (20.1)[2,4]	52.4 (20.2)[1]	54.6 (20.1)	51.0 (17.8)[1]	F = 4.4; p = 0.005
Bodily pain	53.8 (21.7)[2,4]	51.0 (20.9)[1,3]	57.4 (20.4)[2,4]	50.9 (20.6)[1,3]	F = 5.2; p = 0.001
General health	50.0 (21.8)	51.2 (22.3)	53.4 (22.2)	51.8 (21.7)	F = 0.7; p = 0.582
Physical component summary (PCS)	35.7 (10.6)[2,3]	34.3 (10.7)[1,3,4]	40.2 (9.9)[1,2,4]	37.8 (9.4)[2]	F = 20.0; p<0.001
Mental component summary (MCS)	51.8 (10.3)[3,4]	50.2 (11.9)	49.4 (10.1)[1]	49.0 (9.7)[1]	F = 4.9; p = 0.002
Coping (CORS), mean (SD)					
Pain coping style					
Comforting cognition (9–36)	26.7 (4.8)	27.2 (4.7)	26.6 (4.9)	27.3 (4.3)	F = 3.7; p = 0.012
Decreasing activity (8–31)	18.6 (4.7)[2,4]	19.4 (4.3)[1,3]	17.8 (5.0)[2,4]	19.5 (4.5)[1,3]	F = 8.5; p<0.001
Diverting attention (8–30)	17.7 (4.3)[2]	18.7 (4.5)[3]	17.2 (4.4)[2,4]	18.8 (4.2)[3]	F = 6.8; p<0.001
Limitations coping style					
Optimism (5–20)	15.2 (3.0)	15.4 (3.7)	14.7 (3.2)	15.2 (2.6)	F = 3.1; p = 0.027
Pacing (10–40)	27.1 (6.5)[2]	27.7 (6.1)[1,3]	25.0 (6.6)[2,4]	26.2 (5.6)[3]	F = 8.2; p<0.001
Creative solutions (8–32)	20.3 (5.1)	20.8 (5.0)[3]	19.7 (5.0)[2]	19.9 (4.5)	F = 3.3; p<0.020
Dependence coping style					
Accepting (6–24)	14.2 (4.2)	13.8 (4.0)	13.0 (4.0)	13.0 (3.7)	F = 0.7; p = 0.576
Consideration (7–28)	18.7 (3.4)[2]	19.3 (3.5)[1]	18.7 (3.7)	19.4 (3.0)	F = 3.8; p = 0.010
Fatigue (MFI, range 4–20), mean (SD)					
General fatigue	12.3 (4.2)[2,4]	13.2 (4.5)[1,3]	12.4 (4.2)[2,4]	13.4 (3.9)[1,3]	F = 7.7; p<0.001
Physical fatigue	12.4 (4.1)	12.5 (4.1)	11.8 (4.0)	12.4 (3.6)	F = 1.7; p = 0.168
Activity	10.7 (4.1)	10.7 (4.3)	9.9 (4.0)	10.1 (3.8)	F = 1.7; p = 0.173
Motivation	9.7 (3.5)	9.7 (3.8)	9.3 (3.6)	9.3 (3.6)	F = 1.1; p = 0.369
Mental fatigue	8.7 (3.9)	8.7 (4.4)	8.8 (3.9)	9.1 (3.9)	F = 0.9; p = 0.433

Note: Group comparison with Bonferroni correction (p<0.05): 1 = different from male patients with RA; 2 = different from female patients with RA; 3 = different from male patients with AS; 4 = different from female patients with AS.

functioning, bodily pain and vitality—were not found to vary between the diseases. However, there was a sex related difference: women reported lower scores than men.

The mental component scores were more favourable in RA than in AS because of significantly better mental health in men with RA. There was no statistically significant difference between the diseases for other components of mental health related QOL (social functioning and emotional role functioning).

With the exception of the dependence coping style ''accepting'', there were statistically significant differences for all other coping styles. These differences tended to be more sex-specific than disease-specific. Regardless of the disease, women reported significantly more frequent use of the pain coping styles ''decreasing activity'' and ''diverting attention'' and of the limitations coping style ''pacing'' than men. The limitations coping style ''creative solutions'' was used significantly more often by women with RA than by men with AS. Finally, the dependence coping style ''consideration'' was reported significantly more often by women with RA than by men with RA.

There was less difference between the four groups for fatigue, with the exception of the dimension ''general fatigue'', which was reported to be significantly worse by women than by men, irrespective of the disease.

Relationship between work and physical health related QOL for RA and AS

Table 3 lists the results of the stepwise multiple regression analysis of determinants of physical health related QOL in patients with RA and AS. In RA, the demographic variables explained 6% of the variance in the PCS score, with age, sex, and educational level as significant determinants. In AS, these variables explained 12% of the variance. Adding work status to the model significantly increased the explained variance by 8% in the RA sample and by 13% in the AS sample (patients with a paid job had better physical health related QOL). Introducing disease related variables increased the explained variance by 39% in RA and 27% in AS. In RA, all variables contributed significantly to the model, while in AS only disease activity contributed significantly. Adding the coping styles explained another 6% of the variance in RA and another 5% in AS. In the final step, general fatigue was entered and this slightly increased the explained variance in RA by 3% and in AS by 2%. After this last step, disease activity was found to be most closely related to physical health related QOL (patients who reported a higher disease activity had worse physical health related QOL).

All variables included in the final model explained 62% of the variance in physical health related QOL of patients with RA and 59% of the variance in patients with AS. A high correlation with other independent variables for RA meant that the pain coping style ''comforting cognition'' and the limitations coping style ''pacing'' were not included in the model. Variables not included for AS were the pain coping style ''diverting attention'' and the limitations coping styles ''optimism'' and ''pacing''. In the final multivariate model, the relationship between work status and physical health related QOL was still significant in both samples.

Relationship between work and mental health related QOL for RA and AS

Table 4 lists the results of the stepwise multiple regression analysis of determinants of mental health related QOL in patients with RA and AS. In RA, the demographic variables explained only 3% of the variance in the MCS score. In patients with AS, this was even less: only 1% of the explained variance. Adding the variable for work status slightly increased the explained variance in RA by 2% and in AS by

Table 3 Stepwise multiple regression analysis of determinants of physical health related QOL of patients with RA and AS

	Rheumatoid arthritis					Ankylosing spondylitis				
	Partial correlation†					Partial correlation†				
	Step 1	Step 2	Step 3	Step 4	Step 5	Step 1	Step 2	Step 3	Step 4	Step 5
Block 1—Demographics										
Age	−0.19***	−0.10**	−0.01	−0.00	−0.02	−0.14**	−0.08*	−0.05	−0.05	−0.06
Sex	−0.11**	−0.00	−0.01	−0.02	0.01	−0.10*	−0.03	0.02	0.02	0.03
Educational level	0.11**	0.02	−0.05	−0.06	−0.04	0.29***	0.22***	0.14**	0.16**	0.13**
Block 2—Work										
Paid employment		0.29***	0.19**	0.11**	0.11**		0.38***	0.29***	0.19***	0.19***
Block 3—Disease related characteristics										
Disease duration			−0.11**	−0.10*	−0.11**			0.00	0.00	0.00
Disease activity			−0.66***	−0.66***	−0.56***			−0.59***	−0.54***	−0.44***
Comorbidity			−0.09**	−0.08**	−0.06			−0.07	−0.06*	−0.04
Block 4—Coping										
Coping with pain:										
Comforting cognition				–	–				−0.01	−0.01
Decreasing activities				−0.23***	−0.17***				−0.27***	−0.23***
Diverting attention				0.10**	0.08*				0.08	0.07
Coping with limitations										
Optimism				0.07	0.03				–	–
Pacing				–	–				–	–
Creative solutions				−0.10**	−0.12**				−0.07	−0.09*
Coping with dependence										
Accepting				−0.14***	−0.16***				0.03	−0.04
Considering others				−0.03	0.02				−0.04	−0.03
Block 5—Fatigue										
General fatigue					–0.29***					−0.24***
Total R^2	0.06	0.14	0.53	0.59	0.62	0.12	0.25	0.52	0.57	0.59
Incremental R^2	0.06***	0.08***	0.39***	0.06***	0.03***	0.12***	0.13***	0.27***	0.05***	0.02***

*p<0.05; **p<0.01; ***p<0.001.
†Partial correlation coefficients of the independent variables after adjustment of the other independent variables in the model.

5%. The disease related variables explained 6% of the variance in RA and 10% of the variance in AS, with disease activity and comorbidity as significant determinants. Adding the coping styles explained 10% of the variance in RA and 7% of the variance in AS. In particular, the cognitive coping styles ''optimism'' for coping with limitations in RA (patients with RA who were more optimistic when dealing with limitations had a better mental health related QOL) and ''comforting cognition'' for coping with pain in AS were the most significant determinants.

Table 4 Stepwise multiple regression analysis of determinants of mental health related QOL of patients with RA and AS

	Rheumatoid arthritis					Ankylosing spondylitis				
	Partial correlation †					Partial correlation†				
	Step 1	Step 2	Step 3	Step 4	Step 5	Step 1	Step 2	Step 3	Step 4	Step 5
Block 1—Demographics										
Age	0.05	0.09*	0.12**	0.07	0.05	−0.01	0.02	0.02	0.01	0.00
Sex	−0.08*	−0.03	−0.03	−0.04	−0.02	0.00	0.04	0.08	0.06	0.07
Educational level	0.16***	0.12**	0.10**	0.11**	0.13***	0.12**	0.07	0.07	−0.00	−0.03
Block 2—Work										
Paid employment		0.14***	0.08**	0.06	0.06		0.21***	0.14**	0.07	0.06
Block 3—Disease related characteristics										
Disease duration			−0.01	−0.02	−0.03			0.07	0.06	0.07
Disease activity			−0.22***	−0.18***	0.07			−0.30***	−0.23***	−0.09*
Comorbidity			−0.08*	−0.07*	−0.06			−0.09**	−0.08	−0.07
Block 4—Coping										
Coping with pain:										
Comforting cognition				–	–				0.22***	0.20**
Decreasing activities				−0.10**	0.05				−0.12**	−0.07
Diverting attention				0.00	−0.02				0.02	0.00
Coping with limitations:										
Optimism				0.24***	0.21				–	–
Pacing				–	–				–	–
Creative solutions				0.08*	0.07				−0.02	−0.04
Coping with dependence:										
Accepting				0.07	0.06				0.08	0.07
Considering others				−0.06	−0.05				−0.02	−0.01
Block 5—Fatigue										
General fatigue					−0.21***					−0.29
Total R^2	0.03	0.05	0.11	0.21	0.25	0.01	0.06	0.16	0.23	0.30
Incremental R^2	0.03***	0.02***	0.06***	0.10***	0.04***	0.01***	0.05***	0.10***	0.07***	0.07***

*p<0.05; ** p<0.01; *** p<0.001.
†Partial correlation coefficients of the independent variables after adjustment of the other independent variables in the model.

All variables included in the model together explained 25% of the variance in the MCS score for RA and 30% of the variance for AS. In this model, the same variables for RA and AS in the analysis on physical health related QOL were excluded to avoid multicollinearity. In the final model, the relationship between work and mental health related QOL was no longer significant in either RA or AS.

DISCUSSION

Direct comparison of the consequences for patients with RA and AS is difficult because of the different age and sex distributions. However, labour force participation and working ability were identified as a significant problem in both diseases.[10 14] Our study therefore provided a unique opportunity to compare patients with RA and AS directly in the productive stage of life. This might be of relevance to further priorities and planning for health care, because the working ability of rheumatic patients is receiving increasing attention from society as a whole, as well as from rheumatology practice.[25]

Our study shows that physical health related QOL was reported to be worse in patients with RA than in patients with AS of working age, although physical role functioning, one of the components of physical health related QOL, was similar for both diseases. Mental health related QOL was reported to be more favourable in RA than in AS, although social role functioning was quite similar. In addition, the level of fatigue and the way patients cope with stressors of the disease were also similar for patients with RA and AS of working age. Our findings confirm the conclusion of Zink *et al* that RA and AS in patients receiving rheumatological care generate similar amounts of disability, pain, and impact on wellbeing.[11] In addition, we found that the impact on the participation level, as indicated by physical role functioning and social functioning in these patients of working age, is also similar.

As stated above, it might be expected that work provides social status and income and might be valued for its social support and social distraction.[12] We found a positive association between work and physical health related QOL in both patient groups. Furthermore, after disease related factors, work was the most important contributing factor. In RA, work explained 8% of the total explained variance of 62%. In AS, this was 13% of the total variance of 59%. So work contributed considerably and might be an important factor in positively influencing patients' perception of their physical performance.

On the other hand, we did not find any association between work and mental health related QOL in the two patient groups. The most important mediating factors in this relationship were cognitive coping styles. Because both models only explained less than 30% of the variance, we think that the unexplained variance probably reflects unmeasured, non-disease related psychosocial factors such as self esteem, support, and appreciation at the workplace and social support outside the workplace.

A number of conceptual and methodological constraints of the study merit attention. We performed a secondary analysis on data collected primarily in order to study work disability in RA and in AS separately, as part of a larger framework in which work disability was being studied in several other chronic diseases as well. Selection bias (non-response bias) might have affected the observed results. After two reminders had been sent, the response rate was 62% in the RA sample and 60% in the AS sample. Although not high, this is an average rate for studies with postal questionnaires in the Netherlands. A randomised trial of various design and mailing routines for questionnaires in an open population generated an even lower response rate (40–56%).[26] Owing to privacy legislation in the Netherlands, we could not perform an extensive non-response analysis. When the SDR was examined, we did not find any significant differences for age and sex between participants and non-participants in either sample.[9 14] We therefore conclude that our results are at least representative for patients with RA and AS of working age who are receiving specialised care from rheumatologists. It is estimated that 25% of the total RA population and 40% of the AS population in the Netherlands are monitored by rheumatologists.[1]

Conceptually, a generic QOL instrument, the SF-36, was chosen to enable comparison between the patient samples. However, the SF-36 has only a few items relevant to upper extremity function, an important disabling aspect in RA. The disease-specific instruments included to measure functional limitations, the Health Assessment Questionnaire (HAQ) in RA and the Bath Ankylosing Spondylitis Functional Index (BASFI) in AS were closely correlated to the physical functioning dimension of the SF-36 ($r>0.8$).[10 14 27] We therefore conclude that the SF-36 is a valid instrument for measuring physical functioning and comparing different aspects of health related QOL in patients with RA and AS. Moreover the SF-36 captures a wider range of disability in RA and AS, in which comorbidity may also have an important role.

Our regression analysis aimed at assessing the relative contribution of work to health related QOL, in combination with demographics, disease related characteristics, behavioural coping, and fatigue, considered separately and independently. However, some of these factors are unlikely to act independently, being more likely to interact with other characteristics in a given patient. Our analyses did not consider any of these complex interactions. We were primarily interested in the association between work and health related QOL in combination with other important determinants. Moreover, the cross sectional design of our study does not allow us to state that there is a causal relationship between work and physical health related QOL. There is a distinct possibility that patients with a better physical condition are more likely to be in paid employment, despite the fact that we controlled for disease duration, disease activity, and coping. However, it is also known that patients with comparable levels of disease activity can differ greatly in the way they perceive their health, and therefore work might be an important factor that positively influences patient's perceived physical condition.

In conclusion, although physical health related QOL in patients with RA was worse than in patients with AS aged 16–59, the impact on several other dimensions was quite similar. Patients with RA or AS reported the same level of problems for role functioning, including performing a paid job. Moreover, work is an important independent external factor that contributes significantly, together with disease related factors, to physical health related QOL in both patients with RA and AS receiving rheumatological care. Work was not a significant independent factor for mental health related QOL.

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Authors' affiliations

A M J Chorus, Division of Public Health, TNO Prevention and Health, Leiden, The Netherlands
H S Miedema, Netherlands Expert Centre for Work-Related Musculoskeletal Disorders, Erasmus University Hospital Rotterdam, The Netherlands
A Boonen, Sj van der Linden, Department of Internal Medicine, Division of Rheumatology, University Hospital Maastricht, The Netherlands

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Quality of life and work in patients with rheumatoid arthritis and ankylosing spondylitis of working age

A M J Chorus, H S Miedema, A Boonen and Sj van der Linden

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