Goal Management

The role of goal management for successful adaptation to arthritis

Roos Y. Arends [a,b,*], Christina Bode [a,b], Erik Taal [a,b], Mart A.F.J. Van de Laar [a,b,c]

[a] Arthritis Centre Twente, The Netherlands
[b] Department of Psychology, Health & Technology, University of Twente, Enschede, The Netherlands
[c] Department for Rheumatology, Medisch Spectrum Twente, Enschede, The Netherlands

A R T I C L E I N F O

A B S T R A C T

Objective: Persons with polyarthritis often experience difficulties in attaining personal goals due to disease symptoms such as pain, fatigue and reduced mobility. This study examines the relationship of goal management strategies – goal maintenance, goal adjustment, goal disengagement, goal reengagement – with indicators of adaptation to polyarthritis, namely, depression, anxiety, purpose in life, positive affect, participation, and work participation.
Methods: 305 patients diagnosed with polyarthritis participated in a questionnaire study (62% female, 29% employed, mean age: 62 years). Hierarchical multiple-regression-analyses were conducted to examine the relative importance of the goal management strategies for adaptation. Self-efficacy in relation to goal management was also studied.
Results: For all adaptation indicators, the goal management strategies added substantial explained variance to the models (R^2: .07–.27). Goal maintenance and goal adjustment were significant predictors of adaptation to polyarthritis. Self-efficacy partly mediated the influence of goal management strategies.
Conclusion: Goal management strategies were found to be important predictors of successful adaptation to polyarthritis. Overall, adjusting goals to personal ability and circumstances and striving for goals proved to be the most beneficial strategies.
Practice implications: Designing interventions that focus on the effective management of goals may help people to adapt to polyarthritis.

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1. Introduction

The current study focused on the adaptation of people with polyarthritis to their disease. Polyarthritis encompasses a variety of disorders, including rheumatoid arthritis (RA), ankylosing spondylitis and psoriatic arthritis. Disorders classified as polyarthritis are typically involved with inflammation in five or more joints and associated with auto-immune pathology. Inflammation generally causes pain, fatigue and swelling in multiple joints. In spite of medical treatment that may alleviate polyarthritis, for many patients, pain, fatigue, disability, deformity, and reduced quality of life persist [1,2]. Patients often face difficulties with attaining or maintaining goals in several domains of life, including work, social relationships, leisure activities and domestic tasks [3,4].

Five key elements of successful adaptation to a chronic disease have been identified [5]: (1) the successful realization of adaptive tasks; (2) the absence of psychological disorders; (3) the presence of low negative affect and high positive affect; (4) adequate work/ functional status; and (5) satisfaction and well-being in various life domains. It follows that both the absence of psychological distress and the presence of well-being are important for successful adaptation to arthritis. In the present study two negative (depression, anxiety) and three positive (purpose in life, positive affect, participation) indicators of adaptation are used, as these are thought to be important issues for polyarthritis patients.

As a result of its high prevalence compared to healthy controls [6], depressive mood in RA patients has gained much attention in the scientific literature. Moreover, research has shown that RA patients tend to have increased levels of anxiety [7]. Previous findings also revealed lower levels of purpose in life in patients with RA in comparison with healthy populations [8]. Purpose in life – a central aspect of well-being – means: *"the feeling that there is a purpose and meaning in life, (...) a clear comprehensibility of life's purpose, a sense of directedness, and intentionality"* (p. 1071) [9]. Positive affect, another indicator of well-being, lowered the increase in negative affect when levels of pain were elevated in patients with arthritis [10,11]. The experienced level of participation in society is also an essential indicator of adaptation to arthritis, referring to a person's involvement in life experiences,

* Corresponding author at: Department of Psychology, Health & Technology, University of Twente, P.O. Box 217, 7500 AE Enschede, The Netherlands. Tel.: +31 534896204; fax: +31 534892895.
E-mail address: r.y.arends@utwente.nl (R.Y. Arends).

such as socializing and performing one's role in the context of the family. Polyarthritis has been shown to negatively affect participation and work ability [12–14]. Lowered work ability or work loss can imply financial costs for society. For the individual patient, it can mean loss of status, family income and social support [12].

Polyarthritis demands specific competencies by patients for successful adaptation. Due to the absence of a cure, lifelong self-management is essential for coping with polyarthritis. The fluctuating course of polyarthritis and uncertain disease progression threaten patients' feelings of autonomy. Therefore, a sense of regulatory efficacy is of major importance for well-being [15]. Higher self-efficacy for coping with disease symptoms in RA patients is correlated with less fatigue, increased physical ability, decreased pain, improved mood, and improved adherence to health recommendations [16–20].

However, maintaining life as it was before disease onset is often impossible for patients with a progressive chronic disease [21]. Research should therefore not only focus on the management of the disease, but also on how the patient adjusts to abandoning activities and life goals that are no longer feasible. Research has shown that adjusting personal standards and life goals is as important for well-being as pursuing personal goals [22].

Goal management strategies are intended to minimize discrepancies between the actual situation and the goals a person has. These strategies can be seen as possible ways to react to difficulties along the path towards a goal. The dual-process model [23–25] incorporates both assimilative and accommodative modes of coping. The assimilative mode is directed at maintaining goals by actively attempting to alter unsatisfactory life circumstances and situational constraints in accordance with personal preferences. Maintaining goals that are achievable gives people a purpose in life and can offer satisfaction. Accommodative coping is directed towards a revision of self-evaluative standards and personal goals in accordance with perceived deficits and losses – an approach that adjusts goals to the personal bounds of what remains possible. In contrast, the goal adjustment model [26] focuses on goals that are experienced as no longer attainable. This model combines goal disengagement with goal reengagement. Goal disengagement consists of withdrawing effort and commitment from an unattainable goal, with the benefit of releasing limited resources that can then be deployed for alternative actions and new goals. Goal reengagement consists of identifying, committing to and starting to pursue alternative goals. New personal goals seem important for promoting a person's sense of identity [27] and subjective well-being, which should be improved by engaging in personally meaningful activities [28].

The models are partly complementary, and neither is comprehensive with regard to the possible goal management strategies a polyarthritis sufferer – or indeed anyone – can adopt. To be comprehensive but still straightforward, we hypothesized a model that integrates the four strategies (see Fig. 1). This Integrated Model of Goal Management focuses on goal maintenance, goal adjustment, and goal reengagement. The maintenance of goals is considered to be the preferred strategy when a person still perceives opportunities to attain a goal. Goal adjustment is more suitable for situations in which goals are under threat. Goal reengagement seems an appropriate strategy at all times, to complement existing goals or replace unattainable goals. We hypothesized that the strategy of disengaging from goals is one facet of the broader strategy goal adjustment.

To the best of our knowledge, there have been no previous studies that have combined both models of goal management. However, several studies have explored the relationship between goal management strategies and distress for various chronic diseases. Adjustment of goals was found to have beneficial effects on depression and social dysfunction in vision-impaired adults

[29]. Among patients with chronic pain, the ability to adjust goals buffered against the deteriorating effect of the pain experience on depression [25]. A study with patients diagnosed with peripheral arterial disease suggested that, when patients applied the strategy of engaging in new goals, this resulted in fewer depressive symptoms [30]. Another study among patients with multiple sclerosis found that combining low disengagement and low reengagement resulted in fewer depressive feelings [31]. To summarize, the relation between the use of the goal management strategies and distress for patients with a chronic disease is not completely clear yet. For facets of well-being in chronic disease, research has shown positive associations with the use of various goal management strategies [29,31,32]. In the present research, both distress (anxiety and depression) and well-being (purpose in life, positive affect and participation) as indicators of adaptation to a chronic disease were studied.

The main research question was as follows: What is the role of various goal management strategies (goal maintenance, goal adjustment, goal disengagement, and goal reengagement) for adaptation to polyarthritis, as operationalized by the following indicators: anxiety, depression, purpose in life, positive affect, and participation? Hypothesized was that the use of goal management strategies relates positively to successful adaptation. Within the Integrated Model of Goal Management, we hypothesized goal disengagement to be a subcategory of goal adjustment, which would imply a strong relationship between the two strategies. As said before, arthritis related self-efficacy is known to be an important mechanism in adaptation to a rheumatic disease, therefore we studied main effects of self-efficacy on adaptation. The self-efficacy a person perceives in managing disease symptoms like pain and fatigue may also play a role in the effectiveness of different ways of goal management a person can utilize. Therefore, we also examined the role of self-efficacy in relation to goal management strategies and adaptation.

2. Methods

2.1. Sample

For this questionnaire study, participants were selected from an outpatient clinic for rheumatology. Based on the following inclusion criteria, 803 patients were at random selected from the electronic diagnosis registration system: (1) patient is diagnosed with polyarthritis; (2) patient is receiving treatment for polyarthritis. Subsequently, the rheumatologists checked the chart of every patient for the additional inclusion criteria: (3) patient is 18 years or older; (4) patient is able to complete the questionnaire in Dutch, either autonomously or with help. Out of 803 patients, 164 were not approached because they did not meet the inclusion criteria. The internal review board of the Faculty of Behavioural Sciences at the University of Twente approved the study.

2.2. Procedure

A total of 639 patients received an invitation letter, together with the questionnaire and an informed consent form. In time, 305 questionnaires and signed informed consents (48%) were received. Table 1 shows the demographic and clinical characteristics of the participants.

2.3. Measures

Questions were asked about sex, age, marital status, education and employment. Disease duration was asked with the following question: 'In which year did the complaints associated with your arthritis start?' All other questionnaires – including the measures
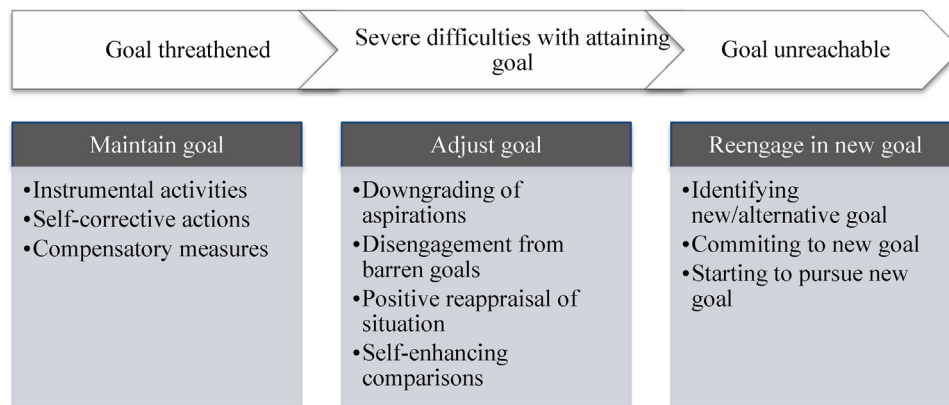
Fig. 1. Integrated Model of Goal Management.

for the goal management strategies and the five indicators of adaptation – are described in Table 2.

2.4. Analyses

For the goal management, self-efficacy and adaptation scales, we tolerated a maximum of 25% of missing answers per scale. Missing values for these scales were replaced by the mean score of the person for the completed items of the scale. For the statistical analyses, version 18 of the Statistical Package for the Social Sciences was used. Means, standard deviations and ranges of scores were calculated for all studied variables. The normal

Table 1
Demographic and clinical characteristics of the participants ($n = 305$).

Demographic characteristics	
Sex, *n* (%)	
Male	116 (38.0)
Female	189 (62.0)
Age (years), mean (SD), range	62.25 (13.3), 18–91
Marital status, *n* (%)	
Not living with partner	76 (24.9)
Living with partner	223 (73.1)
Missing	6 (2)
Educational level, *n* (%)[a]	
No/lower	125 (41.0)
Secondary	109 (35.7)
Higher	64 (21)
Missing	7 (2.3)
Work status, *n* (%)	
No paid job	212 (69.5)
Full-time and part-time employment	88 (28.9)
Missing	5 (1.6)
Disease characteristics	
Diagnosis, *n* (%)	
Rheumatoid arthritis	168 (55.1)
Gout and other crystal diseases	32 (10.5)
Polymyalgia and temporal arteriitis	29 (9.5)
Spondylarthropathy	24 (7.9)
SLE and other systemic diseases	20 (6.6)
Other/non-classifiable	32 (10.5)
Disease duration (years), mean (SD), range	14.78 (12.2), 1–71
Co-morbidities, *n* (%)	
Disease of the cardiac or circulatory system	52 (17)
Sensory disorder	47 (15)
Disorder of the skin	47 (15)
Disorder of the digestive system	43 (14)
Disorder of the respiratory tract	37 (12)
Disorder of urinary of genital	35 (11)
Metabolic disorder	31 (10)
Other (e.g. blood disease, malignancy, mental illness, allergy)	145 (48)

[a] Low: no education, primary school or lower vocational education; middle: high school and middle vocational education; high: high vocational education and university.

distribution was checked by inspection of the histograms and skewness and kurtosis values. A square root transformation [33] was carried out for goal reengagement, as a result of non-normal distribution. The resulting transformed variable was used in all analyses. The variables living situation, education and disease duration were left out of the following analyses because no significant correlations were found with the indicators of adaptation. The IPA subscale entitled work and education was only completed by 37% of the participants and was, therefore, not summed up with the other participation scales.

To test against the main research question regarding the relation of the goal management strategies with the indicators of adaptation, separate hierarchical multiple regression analyses that predicted each of the outcomes were conducted. Data met the requirements of normality, linearity, multicollinearity and homo-scedasticity. In the individual regression analyses, outliers were studied [33]. For the variable purpose in life, one outlier was removed (standardized residual: −4.0, Cook's distance: .43).

In the first model, the demographic variables of sex, age and work situation were entered to control for their predictive value on the indicators of adaptation. The disease related variables – functional limitations, pain, fatigue and co-morbidity – were entered in the second model, followed by the goal management strategies in the third model. The self-efficacy variables were entered in the fourth model. The results of this analysis indicated possible mediation effects, as some of the beta values of goal management strategies decreased after entering the self-efficacy variables into the analysis. Therefore, additional analyses to test possible mediation were performed. The significance of any mediation was tested by use of the conservative Sobel test [34].

Additional analyses were carried out to investigate possible interactions using centred scores, calculated by subtracting the mean score from respondents' raw scores [35]. The interactions of goal maintenance with goal adjustment and goal disengagement with goal reengagement, as well as the interactions of functional limitations with goal maintenance and with goal disengagement, were entered in the model as a fifth step.

3. Results

3.1. Preliminary analyses

Means, minimum and maximum scores, standard deviations and the Cronbach's alpha of the scales can be found in Table 2.

3.2. Correlations

For goal maintenance, we found weak but significant relations with depression, participation and work participation; moderate

Table 2
Characteristics of the questionnaires used in this study.

Variable	Scale	Author	Example	Items	Response options	N	α	Scale range	M	SD
Co-morbidity	Checklist with 15 categories of conditions[a]	Based on the International Classification of Diseases (ICD-10: WHO, 1992)		16		292		0–16	1.43	1.5
Functional limitations	HAQ-DI	Fries, Spitz, Kraines, & Holman, 1980 [46]	Are you able to *dress yourself, including tying shoelaces and doing buttons?*	20	Without any difficulty (0)–unable to do (3)	303	.92	0–3	.98	.76
Pain	1 item numerical rating scale		Amount of pain in the past 7 days, caused by polyarthritis	1	No pain at all (0)–unbearable pain (10)	297	–	0–10	4.05	2.46
Fatigue	100 mm visual analogue scale		Mean amount of fatigue in the past 7 days	1	No fatigue (0)–completely exhausted (100)	296	–	0–100	42.00	26.47
Goal maintenance	Tenacious Goal Pursuit (TGP)	Brandtstädter & Renner, 1990 [47]	When faced with difficulties, I usually double my efforts	15	Strongly disagree (1)–strongly agree (5)	298	.73	15–75	46.94	6.18
Goal adjustment	Flexible Goal Adjustment Scale (FGA)	Brandtstädter & Renner, 1990	I adapt quite easily to changes in plans or circumstances	15	Strongly disagree (1)–strongly agree (5)	299	.79	15–75	51.90	6.52
Goal disengagement	Goal Adjustment Scale	Wrosch, Scheier, Miller et al., 2003 [26]	If I have to stop pursuing an important goal in my life, *it's easy for me to reduce my effort towards a goal*	4	Strongly disagree (1)–strongly agree (5)	297	.53	4–20	11.68	2.31
Goal reengagement	Goal Adjustment Scale	Wrosch, Scheier, Miller et al., 2003	If I have to stop pursuing an important goal in my life, *I seek other meaningful goals*	6	Strongly disagree (1)–strongly agree (5)	298	.88	6–30	21.20[b]	3.57[b]
Self-efficacy pain	Arthritis Self-Efficacy Scale[c]	Lorig et al., 1989 [18]	I am certain that I can keep arthritis pain from interfering with my sleep	5	Strongly disagree (1)–strongly agree (5)	300	.83	1–5	3.24	.80
Self-efficacy for other symptoms	Arthritis Self-Efficacy Scale	Lorig et al., 1989	I am certain that I can control my fatigue	6	Strongly disagree (1)–strongly agree (5)	295	.82	1–5	3.50	.65
Anxiety	Hospital Anxiety and Depression Scale (HADS)	Zigmond & Snaith, 1983 [48]	I feel tense or wound up	7	Various response format (0–3)	302	.83	0–21	5.24	3.69
Depression	HADS	Zigmond & Snaith, 1983	I have lost interest in my appearance	7	Various response format (0–3)	302	.81	0–21	4.73	3.59
Purpose in life	Purpose In Life scale (PIL)[d]	Ryff, 1989 [8]; Ryff & Keyes, 1995 [49]	My daily activities often seem trivial and unimportant to me	6	Strongly disagree (1)–strongly agree (5)	298	.82	6–30	21.84	3.85
Positive affect	Positive scale of the Positive and Negative Affect Schedule (PANAS)	Watson, Clark, & Tellegen, 1988 [50]	Rate how you felt during the past week: e.g. *attentive, interested*	10	Very slightly or not at all (1)–very much (5)	302	.92	10–50	34.29	6.96
Participation	The family role, autonomy outdoors, social relations subscales of the Impact on Participation and Autonomy (IPA) questionnaire[e]	Cardol, De Haan, De Jong, Van den Bos, & De Groot, 2001 [51]	Domain autonomy outdoors: The possibility to spend my (spare) time like I want it, is ...	19	Very good (0)–very poor (4)	300	.76	0–4	1.33	.65
Work participation	The work and education subscale of the (IPA)[f]	Cardol et al., 2001	The possibility to do the job or voluntary work that I want is ...	6	Very good (0)–very poor (4)	114	.88	0–4	1.35	.78

[a] Respondents could also indicate 'other conditions not listed'.
[b] Original variable shown for comprehensiveness reasons.
[c] Dutch translation [52].
[d] One question about everyday purpose in life was added to the PIL: 'Doing the things I do every-day is a source of deep pleasure and satisfaction.'.
[e] The three participation subscales were add up and divided by three, to make up one indicator of perceived participation. With these 19 items a restricted-to-one-factor principal components analysis was carried out to check the one factor structure of the IPA. Investigation of the scree plot and eigenvalues validated a one factor solution (eigenvalue 9.13, 48.03% of the total variance explained).
[f] The subscale work and education was only applicable to 37% of the participants and is, therefore, not summed up with the other participation scales.

Table 3
Pearson correlations for all study variables.

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
1. Sex[a]	–																				
2. Age	−.05	–																			
3. Living situation[b]	−.20**	−.16**	–																		
4. Education[c]	.02	−.29**	−.02	–																	
5. Work situation[d]	−.18**	−.50**	.11	.30**	–																
6. Disease duration	.02	.18**	−.04	.01	.15*	–															
7. HAQ-SDI	.30**	.24**	−.17**	−.22**	−.35**	.27**	–														
8. Pain	.20**	.08	−.10	−.14*	−.22**	.12*	.64**	–													
9. Fatigue	.15*	−.06	−.05	−.01	−.08	.11	.56**	.66**	–												
10. Co-morbidity	.09	.17**	−.10	.06	−.16**	.10	.40**	.30**	.38**	–											
11. Goal maintenance	.00	−.31**	.05	.20**	.25**	−.01	−.15**	−.09	−.05	−.07	–										
12. Goal adjustment	−.01	−.02	.01	.12*	.15*	.12*	−.13*	−.19**	−.25**	−.14*	.16**	–									
13. Goal disengagement	.03	.16**	−.00	−.13*	−.05	.10	.03	.01	−.10	−.01	−.32**	.29**	–								
14. Goal reengagement	.08	−.14*	−.00	.14*	.18**	.09	−.04	−.04	−.02	−.04	.03	.41**	.29**	–							
15. Self-efficacy pain	−.13*	−.02	.09	.08	.17**	−.05	−.52**	−.55**	−.49**	−.23**	.12	.33**	.05	.13*	–						
16. Self-efficacy other	−.15**	.01	.09	.02	.09	.04	−.42**	−.48**	−.52**	−.28**	.16**	.41**	.11	.25**	.76**	–					
17. Anxiety	.03	.02	−.05	−.06	−.12*	−.04	.38**	.42**	.51**	.33**	−.09	−.43**	−.23**	−.25**	−.36**	−.78**	–				
18. Depression	.02	.17**	−.08	−.19**	−.28**	.07	.46**	.37**	.46**	.34**	−.27**	−.50**	−.12	−.32**	−.36**	−.49**	.68**	–			
19. Purpose in life	−.08	−.10	.03	.11	.25**	.09	−.27**	−.19**	−.29**	−.15*	.33**	.47**	.02	.32**	.32**	.51**	−.45**	−.60**	–		
20. Positive affect	−.10	−.04	.07	.10	.20**	.01	−.29**	−.25**	−.37**	−.18*	.33**	.47**	−.03	.22**	.34**	.48**	−.44**	−.65**	.62**	–	
21. Participation	.08	.15*	−.09	−.16**	−.33**	.04	.64**	.51**	.56**	.37**	−.20**	−.37**	−.09	−.25**	−.52**	−.55**	.52**	.62**	−.51*	−.54**	–
22. Work participation	−.02	.13	.02	.03	−.13	−.10	.51**	.50**	.51**	.34*	−.23*	−.43**	−.09	−.17	−.54**	−.52**	.53**	.56**	−.48**	−.57**	.74**

Note: N = 184–305 for all variables, except work participation, (n) = 112–114.

[a] 1 = male, 2 = female.
[b] 0 = not living with partner, 1 = living with partner.
[c] 1 = no/lower education, 2 = secondary education, 3 = higher education.
[d] 0 = no paid job, 1 = full-time and part-time employment.
* Correlation is significant at the .05 level (2-tailed).
** Correlation is significant at the .01 level (2-tailed).

Table 4
Results hierarchical regression analysis for adaptation outcomes.

Variable	Anxiety (n = 272) β	Depression (n = 272) β	Purpose in life (n = 269)[a] β	Positive affect (n = 272) β	Participation (n = 271) β	Work participation (n = 110) β
Demographic variables						
ΔR^2	.02	.08***	.07***	.05**	.13***	.02
Sex[b]	−.09	−.12*	.02	.01	−.11**	−.15
Age	−.04	−.04	.12*	.11	−.10*	.11
Work situation[c]	−.01	−.11*	.15*	.11	−.18***	.08
Disease related						
ΔR^2	.28***	.24***	.07***	.13***	.39***	.39***
Functional limitations	.15*	.28***	−.10	−.11	.43***	.26*
Pain	.06	−.04	.04	.09	−.04	.11
Fatigue	.20**	.16*	−.03	−.18*	.16**	.16
Co-morbidity	.14**	.09	.02	.01	.08	.07
Goal management						
ΔR^2	.13***	.19***	.27***	.20***	.07***	.14***
Goal maintenance	−.00	−.13*	.22***	.23***	−.05	.21**
Goal adjustment	−.21***	−.29***	.28***	.28***	−.11*	−.24*
Goal disengagement	−.11*	−.04	.01	−.04	−.02	−.14
Goal reengagement	−.07	−.11*	.13*	.05	−.11*	.06
Self-efficacy mediation						
ΔR^2	.03**	.03**	.05***	.03**	.02**	.03
Self-efficacy pain	.17*	.21*	−.14	−.12	−.00	−.16
Self-efficacy other	−.29***	−.29***	.37***	.30***	−.20*	−.07
Total model = R^2	.45***	.53***	.46***	.41***	.61***	.57***

[a] One outlier was removed.
[b] 1 = male, 2 = women.
[c] 0 = no paid job, 1 = full-time and part-time employment.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

relations with purpose in life and positive affect; and no significant relation with anxiety (all correlations are shown in Table 3). Both goal adjustment and goal reengagement showed significant negative correlations with anxiety, depression, participation and work participation with weak to moderate associations, and weak to moderate positive correlations with purpose in life and positive affect. Goal disengagement only had significant but weak negative relations with anxiety and depression. Goal adjustment had significant moderate relations with self-efficacy pain and self-efficacy for other symptoms. Goal maintenance and goal reengagement had significant but weak relations with both self-efficacy variables, and goal disengagement showed no significant relations with self-efficacy. Both self-efficacy variables correlated moderate to strong with all six indicators of adaptation. Finally, the disease variables functional limitations, pain as well as fatigue, had significant moderate to strong relations with anxiety, depression, participation and work participation, and low to moderate but still significant relations with purpose in life and positive affect.

3.3. Multivariate relationships between goal management and adaptation

Six separate hierarchical multiple regression analyses were conducted to examine the relative importance of the four goal management strategies and self-efficacy for the six indicators of adaptation (see Table 4).

3.3.1. Anxiety
The goal management strategies together explained 13% of the variance in anxiety, and goal adjustment was found to be the greatest predictor of anxiety. The disease-related variables added 28% to the explanation of anxiety, of which fatigue was the greatest predictor.

3.3.2. Depression
Goal maintenance, goal adjustment and goal reengagement were meaningful predictors for the variance in depression. The

goal management strategies added 19% to the explanation of variance in depression. None of the demographic variables had predictive value for depression in the final model. Functional limitations, pain, fatigue and co-morbidity explained 24% of the variance.

3.3.3. Purpose in life
Goal maintenance, goal adjustment and goal reengagement were found to be important predictors of purpose in life, the four goal management strategies together explained 27% of the variance. The disease related variables explained 7% of the variance.

3.3.4. Positive affect
In the regression model for positive affect, goal adjustment and goal maintenance were the main predictors, and the four goal management variables explained 20% of the variance. Of the disease-related variables (added explained variance was 13%), fatigue was the only predictor that showed a significant contribution.

3.3.5. Participation
Of the goal management strategies, both goal adjustment and goal reengagement were found to predict participation. Goal management added 7% to the explanation of variance of participation. Functional limitations were the main predictors of the satisfaction with participation. The disease variables together explained 39%. Work situation, sex and age together explained 13%; all three were significant predictors of participation.

3.3.6. Work participation
For the satisfaction with work participation, goal adjustment was the main predictor together with goal maintenance. The four goal management variables explained 14% of the variance. The disease-related variables together explained 39%, but only functional limitations was a significant predictor.

Table 5
Significant Mediation of self-efficacy for other symptoms (SE) on adaptation outcomes.

Adaptation	Goal adjustment			Goal maintenance			Goal reengagement		
	β without SE	β with SE	Sobel (p)	β without SE	β with SE	Sobel (p)	β without SE	β with SE	Sobel (p)
Anxiety	−.24**	−.21**	−2.72 (.007)						
Depression	−.31***	−.29***	−2.87 (.004)	−.16**	−.13*	−2.47 (.013)	−.14**	−.11*	−3.23 (.001)
Purpose in life				.26***	.22***	2.62 (.009)	.18**	.13*	3.95 (.000)
Positive affect	.32***	.28***	3.38 (.000)	.26***	.23***	2.50 (.012)			
Participation	−.16*	−.11*	−3.56 (.000)				−.13**	−.11*	−3.40 (.000)

Note: $\Delta R^2 = .02–.05$.

  * $p < .05$.

  ** $p < .01$.

  *** $p < .001$.

3.4. Arthritis related self-efficacy

Self-efficacy pain is a significant predictor for anxiety and depression, and self-efficacy for other symptoms predicted all indicators of adaptation except work participation. The self-efficacy variables added between 2 and 5% of explained variance to the model. Beta-values of some of the goal management strategies decreased after entering self-efficacy for other symptoms in the analyses (Table 5). Sobel tests showed significant partial mediation effects of self-efficacy for other symptoms on these goal management strategies.

3.5. Analysis of interactions between combinations of predictor variables

The extension of the model with parameters for interactions of goal maintenance with goal adjustment and goal disengagement with goal reengagement, as well as the interactions of functional limitations with goal maintenance and with goal disengagement, explained 0–3% (n.s.) of the variance of the indicators of adaptation. The β values for the interaction parameters were between .00 and .15, and so are non-significant.

4. Discussion and conclusion

4.1. Discussion

This study has shown that the tendency to adjust goals to personal abilities and circumstances had the strongest relationship with all indicators of adaptation. People who reported a lower tendency to adjust their goals scored higher on anxiety and depression. In line with this result, people who reported a higher tendency to adjust their goals to changed circumstances, experienced more purpose in life, more positive affect, and were more satisfied with their participation in daily life and their participation in work and education. Without jumping to causal assumptions, to be inclined to adjust threatened goals seemed to be associated with successful adaptation. Besides adjusting personal goals, the tendency to maintain to strive for goals also seemed to benefit adaptation to a chronic disease. Patients who have a higher tendency to keep fighting for their goals experienced fewer depressive symptoms and experienced more purpose in life, positive affect, and satisfaction with their participation in the world of work. This finding highlighted the importance of pursuing personal goals for well-being and adaptation. A higher tendency to disengage from goals was related to lower levels of anxiety. Furthermore, a higher tendency to engage in new goals correlated negatively with depression, but positively with satisfaction with participation and purpose in life. This latter finding is in line with earlier research that indicated that patients who actively search and pursue new goals experienced a more meaningful life, more satisfaction with their participation and lower levels of depression [26].

The wide spectrum of adaptation that this study focused on is a differentiating feature, especially because goal management has not been previously studied specifically in relation to adaptation to polyarthritis. For patients, the absence of psychological distress and the presence of positive affect, as well as the experience of a purpose in life and satisfaction with participation are assumed to be important for their quality of life. Higher tendencies to adjust goals when they become threatened due to chronic disease, maintain goals that are within reach, and search for new goals clearly have positive relations with adaptation to polyarthritis. Although these findings should not be interpreted causally due to the nature of the study design, the results pointed to important processes in the process of adaptation to arthritis. In Section 1 of this paper, we argued for an Integrated Model of Goal Management, in which disengagement is hypothesized to be one of the facets of the adjustment of goals. The data revealed a moderate positive correlation between goal adjustment and goal disengagement and showed that the strategy of goal disengagement explained almost no variance of adaptation, which could point to a high level of shared variance with the strategy of goal adjustment. This finding supports the idea that goal disengagement is an element of goal adjustment and not an independent goal management strategy, thus supporting the Integrated Model of Goal Management described earlier in this paper. As discussed in the next paragraph, the reliability of the subscale disengagement is low and therefore caution is appropriate in interpreting the results. Furthermore, longitudinal studies are needed to clarify the relations between the strategies adjustment and disengagement of goals and to validate the Integrated Model of Goal Management.

The strategy disengagement of goals could explain little of the variance of the adaptation outcomes in this study, which is in common with earlier findings [31]. However, the low reliability of the disengagement subscale in the present study, despite careful forward/backward translation of the items, might have partly influenced the results. Although the scale consists of only four items, in earlier research sufficient alphas of .76–.84 were found [26,31]. Inspection of the items of the scale revealed some inconsistency about the meaning of disengagement. Two items reflected the reduction of effort towards a goal (behaviour) and two other items the relinquishment of commitment towards a goal (mental acceptance) [26]. We believe the acceptance of surrendering a goal to be necessary for well-being and adaptation. However, when the reduction of goal-directed behaviour is not accompanied by acceptance, there can be a negative influence on both well-being and adaptation. Additional analyses including the omission of one or more items could not increase the reliability. Also, the regression analyses showed no other results with the use of a subset of the items. However, the interpretation of the items could have caused the low reliability of the scale, the results should therefore be interpreted carefully.

The tendency to engage in new goals showed less association with adaptation than expected; in the final model, reengagement

only had small relations with the indicators of adaptation. A possible explanation for the small role of reengagement might be the relatively high age of the participants. Reengagement may be of decreasing importance for well-being when people grow older, due to fewer opportunities, failing physical health and a shorter future perspective in comparison with younger or middle-aged adults [36]. More research is needed to clarify the relation between age, reengagement and well-being.

Since adaptation and the use of goal management strategies may be related to the seriousness of disease symptoms, co-morbidities, and demographic characteristics, we included these variables in the regression analyses. The mean scores on functional limitations and levels of pain and fatigue showed that patients did experience limitations and adverse symptoms caused by their polyarthritis. The disease-related features contributed to the explanation of the adaptation of arthritis. But still, the goal management strategies that we studied revealed a meaningful independent contribution to the outcome measures.

Self-efficacy added 2–5% to the explained variance of the outcome measures. Furthermore, self-efficacy only partly mediated some relationships between goal management strategies and adaptation, showing that both concepts are to a large degree distinct. Earlier research pointed to the essential role of arthritis related self-efficacy for study outcomes of arthritis [17,37,38]. However, the results of the current study revealed that, at least for the outcomes examined here, goal management strategies accounted for a high proportion of the explained variance (7–27%).

There were no associations between adaptation outcomes and the combination of functional limitations with specific goal management strategies, indicating that for people with various disease impact the tendency to use goal management has similar outcomes for adaptation. Nor were specific combinations of goal management strategies related to adaptation. As there were no meaningful interaction effects for the combinations of goal management strategies nor for the combinations of functional limitations with goal management strategies, we decided to not discuss the interactions at length.

Some remarks have to be made regarding the measurement of constructs. As a result of the use of generic measures for the goal management strategies, there is no knowledge about specific goals participants had in mind. Further research could complement the present research by the use of other methods such as interviews, to clarify the complex goal management constructs.

Pain and fatigue were each measured with one item in VAS or NRS format.. Although not a multidimensional assessment methods, those were chosen to limit the length of the questionnaire and for their frequent use in rheumatology research [39]. Moreover, pain and fatigue are not key outcomes in this study and use of the questions satisfactory serves the purpose for our examination.

The indicators of adaptation differ in their association with the disease-related variables, thereby indicating the necessity of focusing on both distress and well-being, as mentioned in Section 1. Fatigue and functional limitations showed relations with anxiety, depression and participation in the regression analysis, thus displaying the negative influence that rheumatic symptoms can have on successful adaptation to polyarthritis. The four disease variables together explained a great deal of the variance in anxiety and depression, and could almost explain 40% of the variance in participation and work participation. Participation thus seemed to have the same pattern of relations with the disease related variables as the key indicators of distress: anxiety and depression. As positive affect and purpose in life are weaker related to the severity of pain, fatigue and functional limitations, those indicators can probably have a buffering effect against adverse disease symptoms. This hypothesis for positive affect is already supported by earlier research [11,40].

In the current study, pain could not explain any of the variance of the adaptation indicators. This was in line with earlier research that showed that pain was not the most important stressor for patients with arthritis [20,41]. By contrast, fatigue had a strongly negative relation with adaptation. The relations between fatigue, severity of polyarthritis and well-being seem both intertwined and complex [42,43]. The findings in the present study highlight fatigue once more as an important symptom and stressor for patients with polyarthritis, and therefore one that should receive sufficient attention and monitoring in treatment [44,45].

4.2. Conclusions

The tendency to adjust threatened personal goals came out as especially important, followed by the tendency to maintain striving for goals that are perceived as attainable. Subsequently, if a goal should demand too much precious energy, searching and striving for an alternative goal can alleviate the sense of loss. We conclude that flexibility in the management of goals came out as especially important, by which we mean the competencies to adjust threatened goals downward and to substitute goals that are clearly unattainable with those personally vital goals that one wishes to continue pursuing. Future longitudinal studies will further clarify the causal connection between goal management and adaptation, and give input to psychosocial intervention programs.

4.3. Practice implications

This study highlighted the importance of effective goal management for people who experience difficulties attaining their goals as a result of polyarthritis. Most intervention programs aimed at improving the adaptation of patients to polyarthritis have focused on increasing self-efficacy. In contrast, this study demonstrated the importance of goal management for successful adaptation. Therefore, designing interventions that focus on the effective management of goals may help people to adapt successfully to polyarthritis.

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