Is Coping Self-Efficacy Related to Psychological Distress in Early and Established Rheumatoid Arthritis Patients?

**Jozef Benka · Iveta Nagyova · Jaroslav Rosenberger ·
Zelmira Macejova · Ivica Lazurova · Jac Van der Klink ·
Johan Groothoff · Jitse Van Dijk**

Abstract The study aimed to explore associations between coping self-efficacy and psychological distress in early and established rheumatoid arthritis (RA) patients. Two samples differing in disease duration were collected at outpatient rheumatology clinics in Eastern Slovakia. The first sample consisted of 146 established patients with disease duration of 12 years or more (age=58.02 SD=10.38 years; disease duration=16.08 SD=3.60 years; 86 % women) and the second sample consisted of 102 early RA patients with disease duration of 4 years or less (age=53.25 SD=12.32 years; disease duration = 2.8 SD=1.23 years; 75 % women). The patients underwent a routine rheumatology check and completed questionnaires regarding functional disability, neuroticism and extraversion, coping self-efficacy and psychological distress. The data were analyzed using hierarchical linear regression models. Coping self-efficacy was significantly negatively associated with psychological distress in both samples with the strongest association with anxiety in the early RA group. These associations remained significant after controlling for sociodemographic, disease related and personality variables. Psychological distress was

J. Benka (✉) · I. Nagyova · J. Rosenberger · J. Van Dijk
Graduate School Kosice Institute for Society and Health, Safarik University, Kosice, Slovak Republic
e-mail: jozef.benka@upjs.sk

J. Benka
Department of Educational Psychology and Health Psychology, Faculty of Arts, Safarik University, Kosice, Slovak Republic

I. Nagyova · J. Rosenberger
Institute of Public Health - Department of Social Medicine, Medical Faculty, Safarik University, Kosice, Slovak Republic

J. Rosenberger
Transplantation Department, University Hospital Kosice, Kosice, Slovak Republic

Z. Macejova · I. Lazurova
1st Internal Clinic, Faculty of Medicine, Safarik University, Kosice, Slovak Republic

J. Van der Klink · J. Groothoff · J. Van Dijk
Department of Community & Occupational Health, University Medical Center Groningen, University of Groningen, Groningen, the Netherlands

further associated with disease activity, functional disability, neuroticism and extraversion. However, different patterns in respect to anxiety and depression with the duration of RA was observed. Coping self-efficacy accounted for a unique variance in psychological distress even after controlling for the influence of disease activity, functional status and personality traits. The strongest association was observed with anxiety in early RA patients. As a result, management and intervention programs increasing self-efficacy for coping strategies might be beneficial for reducing anxiety and depression especially during the early phase of the disease.

Keywords Rheumatoid arthritis · Anxiety · Depression · Coping self-efficacy

Introduction

The importance of coping resources have been well recognized in the current research in chronic diseases and especially those involving chronic pain and functional disability such as rheumatoid arthritis (RA) (Bisschop et al. 2004; Chapin 2009; Keefe and Somers 2010; Rao 2009; Sturgeon and Zautra 2010). RA patients are often confronted with functional deterioration and physical disability so coping resources might become essential for managing the tasks of everyday life (Hill et al. 2007; Lok et al. 2010; Michaud and Wolfe 2007; Strand and Khanna 2010; T. P. Suurmeijer et al. 2001; Van Dyke et al. 2004). Findings throughout the literature generally suggest that the population affected by RA is about twice as likely to suffer from increased psychological distress in comparison with the normal population (Dickens et al. 2002; Dickens et al. 2003; Martens et al. 2006; Sheehy et al. 2006). The determinants of psychological distress are not yet fully understood but in addition to the aspects of the disease such as pain, functional disability, and disease activity, coping resources have been shown to be associated with psychological distress, explaining additional variance in distress (Evers et al. 2003a, b; Krol et al. 1995; Nagyova et al. 2005; Zautra 1996).

Along with the medical treatment, it is eventually and inevitably up to the individual patient to cope and manage different aspects of the disease (Amirkhan et al. 1995; Barlow et al. 1996; Barlow et al. 1996; Barlow 1998; Long and Sangster 1993; Lowe et al. 2008; Persson et al. 1999; Ramjeet et al. 2008). Coping resources and especially coping styles have often been explored in order to understand why some patients are more negatively affected by their chronic condition than others (Evers et al. 2003b; Zautra 1996). Evers et al. (2003b) found that active coping with pain in RA was negatively associated with functional status prospectively and active coping with stress was associated with lower psychological distress in early RA patients. Further, avoidant coping was found to be positively related to fatigue and passive coping was positively related to anxiety and depression (Scharloo et al. 1999). In addition, coping has been found to be a significant predictor of psychological distress prospectively (Zautra and Manne 1992). A recent study conducted by Dirik and Karanci (2010) shows that especially when the disease progresses a depletion of coping resources among RA patients can be observed. This is highly relevant for the future adaptation to the disease.

In addition to the differences of coping styles, the concept of self-efficacy as an important coping resource has also been successfully applied when studying different health related behaviors and self-management techniques. The research on self-efficacy in

the RA context has so far focused mostly on the aspects of pain, functional disability or specific task performance (Gyurcsik et al. 2009; Lowe et al. 2008; Somers et al. 2010).

However, while self-efficacy concerning symptom relief has been addressed by a number of studies (Barlow et al. 1996; Barlow 1998; Lowe et al. 2008) the self-efficacy of coping behavior has been less frequently explored. The concept of coping self-efficacy is based on an integration of two well established theories within health research: the self-efficacy theory of Bandura (1999) and the coping theory of Lazarus and Folkman (1984). In the framework of these theories, coping-self efficacy addresses the second phase of coping which represents how an individual patient reacts to a stressful situation and most importantly which coping strategy he or she will apply based on the perceived self-efficacy. Few studies have so far addressed this concept but those that have, showed that it was found to be associated with psychological adjustment in ageing and well-being in the context of chronic diseases (Chesney et al. 2006; Kraaij et al. 2002; Pisanti 2012). This way is coping self-efficacy highly relevant in the context of disease related stress in RA as being self-efficacious in one's coping abilities promotes adaptive coping responses especially during a prolonged period of chronic stress often present in RA (Dirik and Karanci 2010).

As well as to coping resources, personality traits such as neuroticism and extraversion have been found to be strongly related to psychological distress in RA (Long and Sangster 1993; Persson et al. 1999). It can be argued that the effect of these personality traits should be controlled in order to address the specific effect of other personal resources such as coping self-efficacy which is proposed in this study. Personality differences, especially in neuroticism, have been shown to significantly affect the overall psychological adjustment to RA and particularly the aspects of psychological functioning (Suurmeijer et al. 2005). Personality traits are understood to be generally stable even in the context of a long term chronic disease. Thus, the focus in this study is on neuroticism which is a general predisposition to experiencing negative affective states and is closely related to psychological distress. However, personality traits cannot be easily modified and within this study will be used specifically to control for their influence when studying the association between coping self-efficacy and psychological distress.

While individual differences in personality and coping styles as well as specific self-efficacy have been addressed by previous studies in the RA context, this study aims to focus on the role of self-efficacy in using coping resources. It is hypothesized that coping self–efficacy will be negatively associated with depression and anxiety. It is also expected that after controlling for sociodemographic variables, disease related variables and especially individual differences in neuroticism and extraversion, coping self-efficacy will demonstrate a significant negative association with psychological distress. This association will be analyzed and tested in two samples consisting of patients at the early and established stages of RA.

Methods

Participants and Procedure

The study samples were recruited at rheumatology outpatient clinics in Eastern Slovakia. There were two separate samples which consisted of early RA patients with

a disease duration of four years or less and established RA patients with a disease duration of 12 years or more. Essential inclusion criteria were the fulfillment of at least four criteria of the American College Rheumatology Criteria (ACR) (Arnett et al. 1988), diagnosis within the above specified range of time and absence of other serious chronic diseases. The study was approved by the local Ethics Committee and the patients gave informed consent prior to participation in the study. Participating patients underwent routine examination by a rheumatologist, participated in a structured interview and were asked to complete self report questionnaires.

In the established RA group, 222 patients were approached and 157 (71 %) agreed to participate. However, 11 patients were omitted from the current study due to missing data leaving 146 patients (age=58.02; SD=10.38 years; disease duration = 16.08 years; SD=3.60 years; 86 % women), 84.1 % were on disease modifying anti-rheumatic drugs (DMARDs) and 22.3 % on biologic response modifiers (biologics). In the early patient group, 143 patients were approached and 112 (78 %) agreed to participate. From this, ten patients were excluded due to missing data leaving 102 patients (age=53.25; SD=12.32 years; disease duration = 2.81 years; SD=1.23 years; 75 % women) from which 90.3 % were on DMARDS and 22.1 % on biologics.

Measures

Clinical Data

Disease activity was assessed by the Disease Activity Score (DAS 28) which includes Erythrocyte Sedimentation Rate (ESR), which was assessed during the first hour and a tender as well as swollen joint count and patients own assessment on a visual analogue scale. The total DAS 28 score was calculated according to the standard procedure.

Functional Disability

Functional disability was measured using the Groningen Activity Restriction Scale (GARS) developed by Suurmeijer et al. (Kempen and Suurmeijer 1990; Suurmeijer et al. 1994). This scale consists of 18 items which can be divided into two subscales. The first subscale represents Activities of Daily Living and the second subscale represents Instrumental Activities of Daily Living. Respondents were asked to answer each question on a four-point Likert scale indicating how difficult it is for them to perform each activity. The total score consists of both subscales and ranges from 18 to 72 with higher scores indicating higher levels of functional disability. This instrument has been frequently used to measure functional disability among RA patients due to its excellent psychometric characteristics and sensitivity to the impact of RA on everyday activities. Cronbach's alpha in both samples yielded 0.96.

Personality

Neuroticism and Extraversion were assessed by the Eysenck's Personality Questionnaire revised short scale (EPQ-RSS) (Sanderman et al. 2012). In this instrument, patients were asked to answer 12 items with a yes/no response and the sum score was calculated to provide a single score for neuroticism and extraversion with a range of 12–24. A higher

score indicated more neuroticism and more extraversion. Cronbach's alpha in the studied samples reached values of 0.85 and 0.88 for extraversion and 0.82 and 0.85 for neuroticism.

Coping Self-Efficacy

Coping self-efficacy was measured by the Coping Self-Efficacy scale (CSE) (Chesney et al. 2006). It is a 26-item measure of self-efficacy when coping with a challenge or threat. Patients were asked to answer each item of this questionnaire with the instruction: 'When things are not going well for you, or when you're having problems, how confident or certain are you that you can do the following'. Then the patients were asked to rate on an 11-point scale the extent to which they believe they could perform each coping behavior. The instrument originally consists of three subscales measuring self-efficacy for the use of problem focus coping strategies, the ability to stop unpleasant emotions and thoughts and the ability to get support from friends and family with a higher score indicating better coping self-efficacy within each domain (Chesney et al. 2006). Firstly, a mean score was calculated for each subscale. However, due to high inter-correlations between the individual subscales (correlation coefficients ranged from 0.74 to 0.89 in the early group and from 0.86 to 0.92 in the established group) a single summary score of all subscales was calculated for the purposes of the analysis to avoid the problem of multi-colinearity. Cronbach's alpha based on these samples for the whole scale was 0.96 and 0.97.

Psychological Distress

The Hospital Anxiety and Depression Scale (HADS) was applied to measure psychological distress. In this instrument patients were asked to answer questions assessing the level of recent depression or anxiety symptoms on a four-point Likert type scale. The score of each scale ranged from 0 to 21 and a higher score indicated more anxiety or more depression (Zigmond and Snaith 1983). The scale was found to be sufficiently reliable with Cronbach's alpha of 0.80 and 0.79 for anxiety and 0.82 and 0.65 for depression.

Statistical Analysis

First, the means and frequencies in all measured variables of the early and established RA patients were compared using independent t-tests and chi-square tests to detect differences. Next, the associations were analyzed using Pearson correlation coefficients. Finally, the data were entered into hierarchical linear regression models in order to explore the association between coping self-efficacy and psychological distress. This was done after the influence of relevant disease related variables as well as neuroticism and extraversion were controlled. Hierarchical regression models were built using five steps applying the enter method. In the first step gender, age and disease duration were entered. The second step consisted of disease activity (DAS 28) and functional disability. In the third step personality variables, neuroticism and extraversion were added and in the fourth step coping self-efficacy was entered into the model. The fifth step consisted of the interaction term of coping self-efficacy and functional disability to detect a possible moderation. The data were analyzed using SPSS, version 16.

Table 1 Comparison of the early and the established RA patient groups in measured variables

	Early RA (Disease duration ≤ 4 years)		Established RA (Disease duration ≥ 12 years)		p-value
	Mean/N	SD/%	Mean/N	SD/%	
Age	53.25	12.32	58.02	10.38	0.001
Disease duration (in years)	2.81	1.23	16.08	3.60	0.000
Gender (female)	76	75 %	126	86 %	0.019
Married (or living with a partner)	74	73 %	99	69 %	0.445
Living alone	10	10 %	20	14 %	0.339
Depression (HADS)	5.54	3.81	4.96	3.01	0.182
Anxiety (HADS)	7.12	3.81	6.38	3.77	0.131
Disease activity (DAS 28)	4.16	1.27	4.09	1.37	0.747
FW (mm/1st hour)	27.43	19.05	23.58	16.76	0.093
Swollen joints	3.25	4.63	2.98	3.83	0.614
Sensitive joints	10.22	8.36	11.16	8.45	0.385
VAS (disease activity)	5.30	2.25	5.15	2.07	0.588
Functional status (GARS)	32.31	12.01	34.03	11.25	0.251
Neuroticism (EPQ-RS)	19.27	3.52	19.61	3.20	0.431
Extraversion (EPQ-RS)	16.69	3.34	16.38	3.24	0.463
Coping self – efficacy (CSE)	20.58	5.23	19.34	5.54	0.075

Components of DAS28 are displayed in italics

Differences in means and frequencies were checked by independent t-tests and chi-square tests

Results

Firstly, descriptive statistics were computed for the samples of the early and established RA patients and were checked for differences in means and frequencies of the measured variables as shown in Table 1. The established group was found to be older, predominantly female but did not significantly differ in other measured variables.

Table 2 presents correlations of psychological distress in the two samples separately for anxiety and depression. In the early RA patient sample anxiety was associated with gender, worse functional disability, higher disease activity, higher neuroticism and lower coping self-efficacy. While depression showed a similar pattern of associations, it was found to be also associated with extraversion but was not associated with disease activity. In the established sample, both anxiety and depression were associated with higher disease activity, higher neuroticism and lower coping self-efficacy while functional disability was associated only with depression. Lastly, neuroticism was found to be strongly and positively related to depression and anxiety in both samples.

Two regression analyses were conducted in order to explore the associations of anxiety and depression with coping self-efficacy controlling for sociodemographic, disease related and personality variables. Hierarchical regression models were built for both patient groups separately entering an identical set of variables in both samples.

Gender, age and disease duration were entered in the first step and did not produce significant associations with anxiety. In the following steps, functional disability and

Table 2 Correlates of depression and anxiety for early and established groups

	Recent RA		Established RA	
	Depression	Anxiety	Depression	Anxiety
Age	0.06	0.10	−0.07	−0.12
Disease duration (in years)	0.03	0.11	0.16	0.04
Gender (female)	−0.20*	−0.20*	−0.10	−0.09
Disease activity (DAS 28)	0.15	0.31**	0.24**	0.18*
FW (mm/1st hour)	0.11	0.13	0.17*	0.04
Swollen joints	0.07	0.13	0.04	0.22**
Sensitive joints	0.13	0.33***	0.21**	0.13
VAS (disease activity)	0.29**	0.17	0.24**	0.19*
Functional disability (GARS)	0.34***	0.32***	0.32**	0.11
Neuroticism (EPQ-RSS)	0.49***	0.63***	0.38***	0.56***
Extraversion (EPQ-RSS)	−0.29**	−0.11	−0.10	−0.12
Coping self – efficacy (CSE)	−0.45***	−0.59***	−0.47***	−0.40***

Components of DAS28 are displayed in italics

*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$

disease activity were found to be positively associated with anxiety in the early patient sample. However, this association was not found to be significant among the established patients. Disease activity remained positively associated with anxiety in the fourth and fifth steps only in the early RA sample. Neuroticism explained about the same amount of variance in both models and served as the most robust variable. Extraversion was not found to be significant throughout the whole model.

After controlling for the previously entered variables, coping self-efficacy was found to be negatively associated with anxiety in both models but explained relatively more variance in the early RA sample. Next, the interaction term of coping self-efficacy and functional disability was found to be significantly negatively associated with anxiety among the early RA patients but this was not found in the established RA patients. The highest explained variance was observed among the early RA patients in anxiety (Adj. $R^2 = 0.59$) while the model in established RA patients explained relatively less variance (Adj. $R^2 = 0.32$) (Table 3).

The same statistical procedure used for regressions on anxiety was repeated for depression. However, depression showed a different pattern of associations. After controlling for gender, age and disease duration, functional disability was relatively consistently related to depression in both samples. While neuroticism was relatively strongly and positively associated with depression in both models, extraversion was negatively associated with depression only among the early RA patients. Similarly to the anxiety model, coping self-efficacy was found to be negatively associated with depression in both groups when previous steps controlled for the influence of the entered variables. The strength of neuroticism was somewhat reduced in the established group when coping self-efficacy was introduced in the model. The interaction term of coping self-efficacy and functional disability was not significant in either of the

Table 3 Associations of anxiety in early and established RA patient group (hierarchical regression analysis)

		Early RA patients					Established RA patients				
		Step1	Step2	Step3	Step4	Step 5	Step1	Step2	Step3	Step4	Step 5
1.	Gender	0.090	0.054	0.108	0.067	0.058	-0.141	-0.158	-0.029	-0.040	-0.038
	Age	-0.181	-0.082	-0.009	-0.028	0.003	-0.103	-0.063	-0.024	-0.015	-0.012
	RA duration	0.072	0.162	0.119	0.089	0.103	0.055	0.024	-0.019	-0.036	-0.036
2.	DAS 28		0.227*	0.147	0.237**	0.230**		0.147	0.119	0.126	0.131
	GARS		0.228*	0.117	0.052	0.078		0.087	0.021	-0.037	-0.034
3.	Neuroticism			0.561***	0.377***	0.352***			0.553***	0.473***	0.464***
	Extraversion			-0.026	0.015	-0.001			0.049	0.076	0.075
4.	CSE				-0.426***	-0.404***				-0.214*	-0.227**
5.	CSExGARS					-0.174**					0.045
	R²change %	5.3	13	28.2	13.4	2.7	2.8	3.3	27.1	3.2	0.2
	Total R² %	5.3	18.3	46.5	59.9	62.7	2.8	6.2	33.3	36.5	36.6
	Adj. R² %	2.4	14	42.5	56.5	59.0	0.08	2.8	29.9	32.8	32.5
	F	1.820	4.288**	11.665***	17.381***	17.148***	1.368	1.837	9.829***	9.831***	8.742***
	Df1, Df2	3,98	5,96	7,94	8,93	9,92	3,142	5,140	7,138	8,137	9,136

Displayed values are betas (β)

DAS28 disease activity score, *GARS* functional disability, *CSE* coping self-efficacy

*p≤0.05; **p≤0.01; ***p≤0.001

models. The final model on depression was similarly relatively more efficient when based in the early RA patients (Adj. $R^2 = 0.36$) than in the established RA patients (Adj. $R^2 = 0.28$) (Table 4).

Discussion and Conclusion

Firstly, it was hypothesized that coping self–efficacy would be negatively associated with psychological distress and that such a relationship would remain even when relevant variables were controlled for. The results provided support for the hypothesis and showed that coping self-efficacy was found to be negatively related to both anxiety and depression. Evidence for this was found in both samples of early and established RA even when the socio-demographic variables, disease related variables, and personality variables (neuroticism, extraversion) were controlled for. This study has generally found that patients reporting higher self-efficacy to carry out different coping behaviors reported less anxiety and less depression irrespective of the differences in disease related variables or personality differences. This was especially evident in the early RA patients where a large portion of their anxiety was explained by coping self-efficacy.

Secondly, the analysis suggests that coping-self efficacy may play a moderating role and reduce anxiety when faced with high functional disability in early RA. However, it has to be stressed that this was shown only in one model and further research is required to support this. Yet, the findings of this study are in line with other studies concerning RA patients that have provided empirical support of the benefits of active coping in relation to psychological distress (Perrot et al. 2008; Strating et al. 2006; Zyrianova et al. 2011). The present findings are also in line with studies where the concept of self-efficacy has been applied to coping behaviors (Barlow et al. 1996; Barlow et al. 2002; Lowe et al. 2008; Taylor and Stanton 2007). This study presents a relatively newly introduced construct and shows that self-efficacy in coping behavior is significantly associated with psychological distress among both early and established RA patients.

Thirdly, it is especially worth noting that the relatively strongest association was found in the early RA patient group between coping self-efficacy and anxiety. While depression has been addressed quite extensively in RA in the previous research, our findings divert the attention to the relevance of anxiety as a relevant problem at the early stage of RA and its associations with coping self-efficacy.

Regarding personality variables, neuroticism was positively associated with psychological distress in both studied samples as would generally be expected. When neuroticism was entered into the model, it was the most robust variable explaining a relatively high and comparable amount of variance in both samples. This is in line with other findings on RA samples (Persson et al 1999; Lorig and Holman 1982). Neuroticism as emotional instability has been shown to be associated with less adaptive coping styles and thus related to experiencing more psychological distress (Suurmeijer et al. 2005). Extraversion was found to be negatively associated with depression only moderately and only in the early RA sample. This might imply that extraversion might serve as a protective factor at an early stage but no further evidence was found for this in the established group.

Generally, few differences were observed in medical variables and disease related variables when the two groups were compared. No significant differences in disease activity markers were detected in spite of the significant difference in disease duration.

Table 4 Associations of depression in early and established RA patient group (hierarchical regression analysis)

		Early RA patients					Established RA patients				
		Step1	Step2	Step3	Step4	Step 5	Step1	Step2	Step3	Step4	Step 5
1.	Gender	0.051*	0.012	0.058	0.034	0.028	−0.107	−0.155	−0.083	−0.100	−0.102
	Age	−0.195	−0.170	−0.114	−0.125	−0.107	−0.105	−0.055	−0.036	−0.023	−0.026
	RA duration	−0.007	0.026	−0.025	−0.043	−0.035	0.168*	0.110	0.087	0.060	0.060
2.	DAS 28		−0.036	−0.064	−0.011	−0.015		0.136	0.116	0.126	0.120
	GARS		0.343**	0.252**	0.214*	0.229*		0.283**	0.246**	0.160*	0.156
3.	Neuroticism			0.393***	0.284**	0.270*			0.317***	0.198*	0.209*
	Extraversion			−0.221*	−0.197*	−0.206*			−0.002	−0.042	−0.042
4.	CSE				−0.252**	−0.239*				−0.317***	−0.302***
5.	CSE×GARS					−0.100					−0.050
	R^2change %	4.1	10.6	21.1	4.7	0.9	4.5	11.1	9.3	7.0	0.2
	Total R^2 %	4.1	14.7	35.9	40.6	41.5	4.5	15.6	25.0	32.0	32.2
	Adj. R^2 %	1.2	10.3	31.1	35.5	35.8	2.5	12.6	21.2	28.0	27.7
	F	1.399	3.321**	7.516***	7.944***	7.249***	2.221	5.188***	6.557***	8.050***	7.175***
	Df1, Df2	3,98	5,96	7,94	8,93	9,92	3,142	5,140	7,138	8,137	9,136

Displayed values are betas (β)

*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$

When the early RA patients were included in the study they had already been medically treated which might have contributed to the relative stability of their condition. Prospective studies conducted on representative samples have reported similar findings when the patients were followed from 4 up to 13 years (Strating et al. 2006). Further, patients with early RA did not show higher coping self-efficacy than the established patients. While the data did not show differences in coping self-efficacy they showed that different patterns of associations existed for early and established patients regarding two aspects of psychological distress, anxiety and depression.

The present study has explored the research question on two separate samples of RA patients with different disease duration. The fact that the models were significant at both early and established stages of the disease provides support for the validity of the findings. Furthermore, the present analysis also allowed for the controlling of disease related variables and eliminating the influence of differences in personality traits when exploring the specific effect of coping self-efficacy on psychological distress. However, it also must be said that the findings are based on cross-sectional analyses which creates limitations for drawing causal conclusions. Furthermore, the appointed selection criteria for the length of disease duration for early and established patients was chosen rather arbitrarily even though based on substantial previous research focusing on the social and psychological aspects of adaptation to RA where application of similar criteria can be found (Doeglas et al. 2004; Strating et al. 2006; Suurmeijer et al. 2001). However, this study applied a relatively new measure of coping self-efficacy which requires further methodological exploration.

Coping self-efficacy can be improved by psychological interventions and can be addressed in RA patients by training programs or as a part of the disease management programs. Monitoring such programs in the future might improve the understanding of the pathways of the relationships between coping self-efficacy and psychological distress. It might also be useful to screen patients for coping self-efficacy or their level of confidence to cope and manage the threats imposed directly or indirectly by RA. Based on the findings of this study the results are most relevant for the levels of anxiety in the early years of the disease.

Patients who reported higher self-efficacy or confidence in performing coping behaviors showed lower psychological distress in both samples of early and established RA even when differences in disease related variables and personality were controlled. Overall, the strongest associations were detected in the early patient sample between coping self-efficacy and anxiety. These findings imply that the coping self-efficacy concept could be useful in further research in the context of RA and subsequently applied to patient care.

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