

Social Support as a Moderator of Functional Disability's Effect on Depressive Feelings in Early Rheumatoid Arthritis: A Four-Year Prospective Study

Jozef Benka and Iveta Nagyova
P. J. Šafárik University

Jaroslav Rosenberger
P. J. Šafárik University and University Hospital L. P., Košice,
Slovak Republic

Anna Calfova, Zelmira Macejova, and
Ivica Lazurova
P. J. Šafárik University

Jitse P. van Dijk
P. J. Šafárik University and University Medical Centre
Groningen, University of Groningen

Johan W. Groothoff
University Medical Centre Groningen, University of Groningen

Objective: To examine associations of depressive feelings with disease-related variables and explore the moderating effect of social support on depressive feelings in individuals with early rheumatoid arthritis (RA) prospectively over 4 years. **Method:** Data were collected annually over 4 years. The sample consisted of 124 individuals with diagnosed RA (85.5% women; mean age 47.9 years; mean disease duration 22.2 months). The strength of cross-sectional and prospective associations of sociodemographic, disease-related variables and the direct and moderating effects of social support on depression were tested using correlations, multilevel models, and hierarchical linear regressions. **Results:** The study showed that emotional support moderated the influence of functional disability on depressive feelings in individuals with RA. This was not detected for instrumental support. Further prospective associations between functional status, marital status, and depressive feelings were also found. Overall, the strongest association was found between initial depressive feelings and depressive feelings over time. **Conclusions:** Initial depression seemed to be a risk factor in explaining later depressive feelings, but emotional support might be prospectively beneficial, especially for individuals with higher levels of disability. Early detection of individuals at risk for depression and providing interventions aimed at the specific functions of social support might help to decrease mental health problems.

Keywords: social support, rheumatoid arthritis, functional status, depressive feelings, moderation

Impact and Implications

● Although the role of moderating social support in rheumatoid arthritis has been previously addressed, the findings are thus far inconclusive. This study extends the findings by focusing specifically on emotional and instrumental types of support.

● The study contributes to the current knowledge by finding that emotional support can decrease the negative impact of functional disability on depression. However, it also shows that initial depression remains the main risk factor for experiencing depression later in the disease.

● Social support is relevant for patients' well-being and should be taken into consideration especially in the context of high functional disability.

Introduction

A number of studies have reported increased levels of depressive feelings in individuals with rheumatoid arthritis (RA) (Chaney et al., 2004; Covic, Tyson, Spencer, & Howe, 2006; Creed, 1990; Dickens, 2002; Lok, Mok, Cheng, & Cheung, 2010). Studies focusing on the prevalence of depression vary regarding the exact

This article was published Online First December 9, 2013.

Jozef Benka, Graduate School Košice Institute for Society and Health, Faculty of Medicine, and Department of Educational Psychology and Health Psychology, Faculty of Arts, P. J. Šafárik University, Košice, Slovak Republic; Iveta Nagyova, Graduate School Košice Institute for Society and Health, Faculty of Medicine and Institute of Public Health—Department of Social Medicine, Faculty of Medicine, P. J. Šafárik University, Košice, Slovak Republic; Jaroslav Rosenberger, Graduate School Košice Institute for Society and Health, Faculty of Medicine, Institute of Public Health—Department of Social Medicine, Faculty of Medicine, P. J. Šafárik University, Košice, Slovak Republic, and Transplantation Department, University Hospital L. P., Košice, Slovak Republic; Anna Calfova, Zelmira Macejova, and Ivica Lazurova, 1st Internal Clinic, Faculty of Medicine, P. J. Šafárik University, Košice, Slovak Republic; Jitse P. van Dijk, Graduate School Košice Institute for Society and

Health, Faculty of Medicine, P. J. Šafárik University, Košice, Slovak Republic and Department of Community & Occupational Health, University Medical Centre Groningen, University of Groningen, The Netherlands; Johan W. Groothoff, Department of Community & Occupational Health, University Medical Centre Groningen, University of Groningen, The Netherlands.

This work was supported by the Slovak Research and Development Agency under contracts APVV-20-038305 (20%) and APVV-0220-10 (60%). Furthermore, this work was partially supported by the Agency of the Slovak Ministry of the Education, Science, Research and Sport of the Slovak Republic for the Structural Funds of the EU under project ITMS: 26220120058 (20%).

Correspondence concerning this article should be addressed to Jozef Benka, PhD, Moyzesova 9, 04001 Košice, Slovak Republic. E-mail: jozef.benka@upjs.sk

level depending on the method and sociodemographic characteristics used, but a review of the literature suggests that individuals with RA are about twice as likely to suffer from depression in comparison with the normal population (Dickens, 2001; Martens, 2006; Sheehy, Murphy, & Barry, 2006).

Evidence exists that depression in individuals with RA is related to physical disability, pain and fatigue caused by the disease (Bazzichi et al., 2005; Smedstad, Moum, Vaglum, & Kvien, 1996). However, these disease-related variables alone are insufficient to fully explain these negative feelings (Covic et al., 2006; Evers, Kraaimaat, Geenen, & Bijlsma, 1998). Physical disability is undoubtedly an important indicator of restriction in daily functioning but is often only a crude reflection of an individual's actual functioning in his or her social environment (Doeglas et al., 1994; Hewlett, Smith, & Kirwan, 2002; Strating, van Schuur, & Suurmeijer, 2006). Associations between disease-related variables and depression have been analyzed further by a number of authors (Bazzichi et al., 2005; Smedstad et al., 1996; Katz, Morris, & Yelin, 2006). Katz has suggested a close connection between depressive feelings and the ability to perform valued activities. She claims that it is not necessarily the physical disability itself but rather the very specific limitations imposed by it that may lead to depression (Katz et al., 2006).

The positive effects of social support on health have been shown in many studies (Cohen & Wills, 1985; Stanton, Revenson, & Tennen, 2007; Trehan, Kitas, Lyons, & Booth, 2005). Regarding RA, elements of the social environment, such as social stresses and a lack of social support, may contribute considerably to an increase in depressive feelings (Dickens, 2003). Thus, the depressive feelings that individuals with RA experience may not only reflect the activity and disabling effect of arthritis, but also the social environment of the individual.

Functional disability imposes limitations which when appraised as exceeding an individual's resources can cause considerable stress to individuals with RA (Doeglas et al., 2004). As a consequence, social resources may become crucial for successful adaptation. According to classical theories of stress and coping, functional disability may pose a stressor that requires the initiation of coping actions, including the successful activation of social support (Folkman & Moskowitz, 2004; Lazarus & Folkman, 1984).

This study specifically addresses two types of social support. These are emotional and instrumental types of support which serve specific functions. The aim of the study is to address the moderating role of instrumental and emotional social support within the framework of the classical stress and coping theory as shown in Figure 1.

The findings concerning these specific functions of social support in individuals with RA have been found to be rather inconsistent in the current literature. A direct effect of social support has been demonstrated in the context of RA (Fyrand, Moum, Finset, & Glennås, 2002; Keefe et al., 2002; Strating, Suurmeijer, & van Schuur, 2006), but findings about its potential moderating effect seem to be less clear (Doeglas et al., 2004; Neugebauer, Katz, & Pasch, 2003).

The aim of the present study is twofold. First, the study aims to explore the associations between depressive feelings with disease-related variables (ESR, joint tenderness, functional disability) over time. Second, the study aims to address the potential moderating roles of emotional and instrumental support among individuals

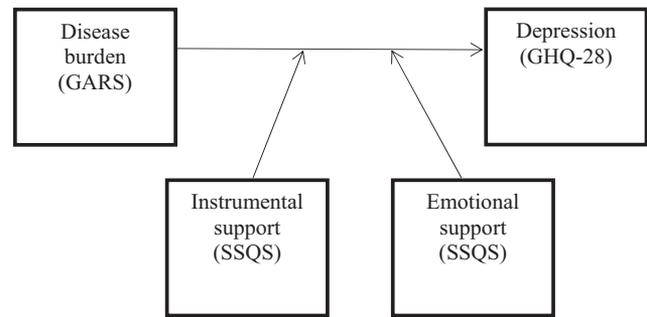


Figure 1. Theoretical model of the role of social support in coping with the burden of the disease.

with RA who experience depressive feelings related to disease-related disability. This study uses functional disability as an indicator of disease burden associated with RA. The goal is to examine whether emotional and instrumental support can ameliorate the negative impact of RA via a moderating effect.

Method

Sample and Procedure

This study is the Slovak part of the EURIDISS (European Research on Incapacitating Diseases and Social Support) project. Four waves of data collection were carried out during the years 1994–1998. Inclusion criteria for participating in the study were: age from 20 to 70 years at the beginning of the study, RA diagnosed no more than 4 years prior to the beginning of the study, fulfillment of at least four criteria of the American College of Rheumatology (ACR), and signing the informed consent form.

According to the above-mentioned criteria, 176 individuals from eastern Slovakia were found to be eligible, of which 16 refused to participate. Thus, the first wave (T1) consisted of 160 individuals. In the second wave (T2) nine individuals were lost and in the third wave (T3) an additional 18 individuals ceased participation. An additional nine individuals were lost in the fourth wave (T4). The overall response rate of the study was thus 77.5%, with 124 individuals participating in the fourth wave. The dropouts from the study and the individuals participating in the fourth wave were compared in order to ascertain whether they differed in characteristics obtained at the beginning of the study. Sex, age, disease duration in months, depressive feelings and functional disability were compared and no significant differences were found.

The data were collected at annual intervals via administration of the same set of questionnaires during a semistructured interview conducted by a trained interviewer and lasting about 90 minutes. Medical information about the individuals was retrieved from their medical files.

Measures

Sociodemographic variables were collected via a separate questionnaire, which provided basic information about the age, sex, marital status, residence, and overall living conditions of the individuals. Further detailed information about the disease was retrieved from individual medical files.

Depressive feelings were measured using the General Health Questionnaire (GHQ-28; Goldberg & Hillier, 1979). In this instrument the individual was asked about his recent health status and answered each question on a 4-point Likert scale. Items have four possible response categories: *not at all*, *no more than usual*, *rather more than usual*, *much more than usual*. The depression subscale consists of 7 items, and its total score ranges from 7 to 28, with a higher score indicating stronger depressive feelings (Goldberg & Hillier, 1979). This instrument has been frequently used to evaluate psychological functioning in individuals with RA (Doeglas et al., 2004; Strating, Suurmeijer, & van Schuur, 2006). Cronbach's alpha of the scale assessed at the baseline was 0.83.

Disease activity was assessed via Erythrocyte Sedimentation Rate (ESR) during the first hour, and joint tenderness was assessed using the Ritchie Articular Index (RAI). This examination was performed by a rheumatologist. Firm pressure to each joint is applied and the individual's reaction was recorded on a 4-point scale ranging from *no pain*, *pain complaint*, *complaint and wince* and *withdrawal*.

Functional disability was measured using the Groningen Activity Restriction Scale (GARS) (Suurmeijer et al., 1994). This scale consists of 18 items divided into two subscales. The first subscale represents Activities of Daily Living and the second subscale represents Instrumental Activities of Daily Living. Individuals were asked to answer each question on a 4-point Likert scale indicating how difficult the activity was for them to perform. Scores range from 18–72, with higher scores indicating higher levels of functional disability. This instrument has been frequently used to measure functional disability among individuals with RA due to its excellent psychometric characteristics with a high sensitivity (Szilasióvá et al., 1998; Doeglas et al., 2004). In this study, this measure of functional disability was used as a proxy for assessing the disease burden caused by RA (Doeglas et al., 2004). Cronbach's alpha at the baseline was 0.95 for this scale.

Social support was measured using the Satisfaction with Social Support Questionnaire (SSQS) (Doeglas et al., 1994). In our study, two subscales from this measure were applied to assess emotional support satisfaction (ESS) and instrumental support satisfaction (INS). The discrepancy between the received and the desired amount of social support was considered to be the indicator of satisfaction with the social support. Individuals answered each question on a 3-point Likert scale. Scores for emotional support range from 11 to 33 and for instrumental support from 7 to 21, with a higher score indicating more satisfaction with the supportive transactions (Doeglas et al., 1996). Cronbach's alpha at the baseline of this study was 0.86 for emotional support, and 0.76 for instrumental support.

All measures were administered in the Slovak language. Prior to the beginning of the study, all measures were translated by experts with proficiency in English language using the forward-backward translation method (Nagyova et al., 2009).

Statistical Methods

The prospective data set was first analyzed using descriptive statistics. Then cross-sectional correlation coefficients were computed to explore associations at each wave (T1—first wave, T2—second wave, T3—third wave, T4—fourth wave). In the next step, multilevel analysis was performed by building six hierarchi-

cal models. This allowed the exploration of a joint contribution of all measured variables as well as statistical control for relevant variables. Furthermore, multilevel analysis was chosen to effectively address the level of variance within persons and time in order to explore the associations of the studied variables with levels of depression over time. In addition, the interaction of social support and functional status on depressive feelings was tested in order to explore the possible moderating effect. This analysis was further followed by individual hierarchical linear regression analyses conducted separately for every point of measurement to explore the moderation effect of social support. A significant effect of the interaction between social support and the functional disability after controlling for the direct effect of both of these variables on depressive feelings was considered as proof of the moderating assumption. This was followed by testing the significance of simple slopes (Aiken & West, 1991; Holmbeck, 2002). Data were centered to avoid the effects of colinearity prior to exploring the interaction variables. All data were analyzed using SPSS, version 20.

Results

Descriptive Statistics

The sample was predominantly female (85.5%) and married (77.4%) with a mean age of 47.9 ($SD = 12.53$) and mean disease duration of 22.2 ($SD = 16.03$) months. The means and standard deviations of depressive feelings, functional status, disease activity, emotional support and instrumental support are displayed in Table 1.

Cross-Sectional Analysis

The cross-sectional relationships between functional disability, social support scales, and depressive feelings were investigated by means of correlation coefficients over the 4-year period. Statistically significant associations (not displayed in the table) between functional disability and depressive feelings were found in every wave $r = .27$ at T1, $r = .46$ at T2, $r = .48$ at T3, $r = .44$ at T4, all statistically significant ($p < .001$).

The association between emotional support and depressive feelings was not significant in the first two waves but became significant in the following years, with levels of correlation at $r = -0.31$ at T3 and $r = -0.40$ at T4, both significant ($p < .001$). The direction of the associations showed that greater satisfaction with emotional support was connected with experiencing fewer depressive feelings during the progression of the disease. However, instrumental support presented a different pattern of correlations, showing a significant association in the first wave at $r = -0.23$ ($p < .05$), failing to be significant in the second wave and being significant for the last two waves at $r = -0.17$ ($p < .05$) and $r = -0.34$ ($p < .001$). These associations were also negative, which mean that lower satisfaction with instrumental support was connected with greater depressive feelings.

Multilevel Analysis

Multilevel analysis was performed with a baseline model followed by six successive models, which are presented in Table 2.

Table 1
Displayed Values as Means and Standard Deviations of Depression, Disease Activity, Functional Disability and Social Support Over Four Years in Individuals With RA

	Score range	T1 Mean (<i>SD</i>) baseline	T2 Mean (<i>SD</i>) 12 months	T3* Mean (<i>SD</i>) 24 months	T4 Mean (<i>SD</i>) 36 months
Depression	7–28	9.8 (3.3)	9.1 (3.2)	9.4 (3.3)	9.6 (3.9)
ESR	1–150	26.4 (18.4)	23.0 (17.5)	23.1 (17.7)	25.9 (18.2)
RAI	0–72	13.5 (7.3)	12.8 (9.1)	12.4 (9.4)	11.5 (8.9)
GARS	18–72	32.4 (11.1)	32.1 (10.6)	34.6 (11.4)	35.8 (12.7)
ESS	11–33	29.4 (4.0)	29.9 (4.0)	30.7 (3.5)	30.7 (3.8)
INS	7–21	19.3 (2.5)	19.7 (2.4)	19.6 (2.6)	19.7 (2.6)

Note. GARS = Groningen Activity Restriction Scale; RAI = Ritchie Articular Index; ESR = Erythrocyte Sedimentation Rate; ESS = Emotional Support Satisfaction Scale; INS = Instrumental Support Satisfaction Scale.

* Eight individuals failed to participate at T3 so means and *SD* were calculated only from 116 respondents.

These models gradually included sociodemographic variables, initial levels of depression, disease activity (erythrocyte sedimentation rate and sensitive joints) functional disability, and social support (instrumental and emotional) as well as the interaction terms of social support and functional disability. The first model included sex, age, marital status, and disease duration although only marital status was found to be significant in the subsequent models. In the second model, the initial level of depression was added to the analysis and significantly improved the model. In the next model, the Erythrocyte Sedimentation Rate and the Ritchie Articular Index were included but did not significantly improve the model. Nor were they found to be significant in the further analysis. The fourth presented model showed that functional disability significantly contributed to the model and improved its explanatory power. Finally, two additional models were built by adding emotional social support and instrumental social support (Model 5) and their interactions with functional disability (Model 6, the final model). While the contribution of social support measures to the model was statistically weaker, the interaction term of emotional support and functional disability was found to be significant. This suggests a moderation effect that was not observed regarding instrumental support. Overall, the statistically strongest model was Model 4, which indicated that the initial levels of depression served as the strongest explanatory variable and thus showed that initial depression was the greatest risk factor for depression later in the disease.

Moderation Analysis

In the next step, the interaction term of emotional support and functional disability was further tested individually as a predictor of depressive feelings at the three subsequent waves (T2, T3, and T4), controlling for the main effect of functional disability and emotional support. As shown in Table 3, all interactions were found to be statistically significant. The analysis showed the same pattern over time although both main effects and the interaction were found to be significant only in predicting depressive feelings at the fourth wave ($p \leq .001$). Interactions were subsequently tested for the significance of simple slopes (Aiken et al., 1991). Low emotional support slopes were shown to be significant ($p < .001$) suggesting that the patients with low emotional support and

high functional disability experienced more depressive feelings prospectively. The interaction predicting depressive feelings at T4 is shown in Figure 2.

Discussion and Conclusion

Discussion

The aim of the present study was to explore the associations of disease-related variables with depressive feelings over time. Furthermore, the aim focused on the moderating role of emotional support and instrumental support on depressive feelings when facing functional disability as a result of RA.

Emotional support was found to be moderately related to depressive feelings over time. This association remained significant throughout the four waves of data collection. However, the multilevel analysis showed that initial depression played the most important role in predicting later depression (Coyne, Pepper, & Flynn, 1999). This finding is in line with other studies that also found a close association between emotional support and depressive feelings cross-sectionally (Covic et al., 2006; Demange et al., 2004) and longitudinally (Evers, Kraaimaat, Geenen, Jacobs, & Bijlsma, 2002; Strating, Suurmeijer, & van Schuur, 2006). The results also suggest that emotional support may have a moderating effect on depressive feelings prospectively where individuals with low levels of emotional support were found to experience more depressive feelings when facing higher functional disability. Studies investigating the moderating effect of social support in populations of the chronically ill have demonstrated similar results (Jump et al., 2005; Olstad, 2001). However, studies in the context of RA have so far failed to provide clear evidence (Doeglas et al., 2004; Neugebauer & Katz, 2004).

The association between instrumental support and depressive feelings was found to be much weaker, and no direct or moderating effect could be detected. Studies investigating the role of instrumental support in individuals with RA have found stronger associations with functional disability within a specific area (Katz et al., 2006; Neugebauer et al., 2003). This may be due to the fact that instrumental support is less directly related to depressive feelings and, as Neugebauer and Katz (2004) suggest, it is rather more

Table 3
Hierarchical Regression Analysis of Baseline Functional Disability, Emotional Support and Their Interaction Effect on Depressive Feelings Measured in Annual Intervals

	Depression T2 12 months	Depression T3 24 months	Depression T4 36 months
1. GARS T1	0.336***	0.395***	0.319***
2. ESS T1	-0.119	-0.133	-0.274***
3. ESS T1 × GARS T1	-0.162*	-0.261**	-0.271***

Note. GARS = Groningen Activity Restriction Scale; ESS = Emotional Support Satisfaction Scale. Displayed values are standardized β coefficients.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

closely related to valued activities that may affect psychological functioning. The present analysis focused on the impact of general functional disability rather than on limitations in specific activities. Instrumental support as a practical aid or assistance is undoubtedly important, if not essential, for some individuals, yet it seems that individuals from this sample adapted to physical limitations well in regard to depression. Rather, their psychological functioning was more greatly determined by their social environment. Finally, it should be mentioned that the relationship between the social environment and an individual is very complex and other moderating or mediating variables might be important to address. By this, personality variables such as self-concept or self-efficacy could provide a deeper understanding of this relationship and also functional aspects of social support.

Functional disability significantly predicted depressive feelings and explained a considerable amount of the variance. This result is in line with other studies showing this association (Evers, Kraaimaat, Geenen & Bijlsma, 1997). The course of depressive feelings in the population under study was observed to be relatively stable, and no substantial differences were found in the level of depression between consecutive measure-

ments. The analysis showed that depressive feelings experienced during previous years were a very important variable in predicting depression later in the disease (Coyne et al., 1999). Similar results were found in the study conducted by Strating, Suurmeijer, & van Schuur, 2006). This means that individuals who have elevated levels of depressive feelings at the onset of RA, or even before, are naturally at a greater risk of elevated levels of depression as the disease progresses (Doeglas et al., 2004; Strating, Suurmeijer, & van Schuur, 2006). This is also in line with the concept of Coyne et al. (1999), who showed that pre-morbid depression was the most powerful risk factor for depression in other chronic disease.

However, it is important to acknowledge the limitations to this study. The level of depressive feelings among individuals in the sample was relatively low but was comparable with similar studies employing GHQ-28 (Doeglas et al., 2004). Similarly, the level of functional disability as measured by GARS can be related to findings in other studies (Strating, Suurmeijer, & van Schuur, 2006; Doeglas et al., 2004). At the time these data were collected, individuals were not able to benefit from the application of biological agents as the main treatment, which has become an important means of decreasing the impact of RA. Furthermore, functional disability was chosen as the stressor similarly to the study conducted by Doeglas et al. (2004) because it summarizes the impact of many symptoms caused by RA such as pain, destruction of the joints, and overall disability. However, this does not in itself necessarily reflect all of the stress imposed on individuals by RA. Other or additional variables exploring the moderating effect of social support could enhance the understanding of its function and especially controlling for personality variables (Suurmeijer et al., 2005). Social support was assessed only by self-report measures operationalized by reported satisfaction with a number of supporting transactions. It must be mentioned that this creates certain limitations regarding the theoretically assumed causality of the moderating effect by a possible overlap of the self-reported assessment of social support and depression. It may be very useful for future research to acquire information from relatives or caregivers, especially partners of the individuals mapping their social environment more efficiently and providing extra information beyond the self-report measures (Strating, Suurmeijer, & van Schuur, 2006).

Conclusion

This study was based on longitudinal data, which allowed the building of a relatively strong predictive model. The chosen mul-

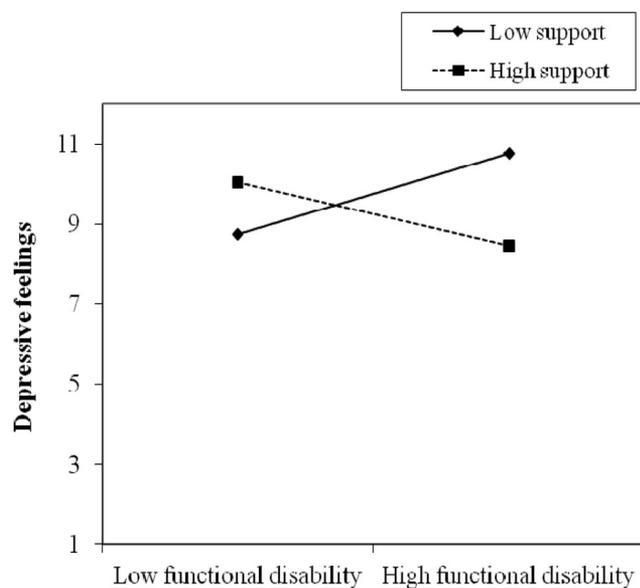


Figure 2. Interaction of baseline emotional support and functional disability on depressive feelings at T4.

level model was able to control for relevant sociodemographic variables and for the initial level of depression. The findings of this study suggest that emotional support moderates the burden of functional disability imposed by the symptoms of RA. It can thus serve in early RA as an indicator of an individual's vulnerability to depression, which can be useful for devising intervention programs aimed specifically at this subtype of social support. In conclusion, it should be stressed that checking for depression and its treatment in RA patients at or early after diagnosis may favorably influence the overall quality of life in this patient group.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. London, UK: SAGE
- Bazzichi, L., Maser, J., Piccinni, A., Rucci, P., Del Debbio, A., Vivarelli, L., . . . Dell'Osso, L. (2005). Quality of life in rheumatoid arthritis: Impact of disability and lifetime depressive spectrum symptomatology. *Clinical and Experimental Rheumatology*, *23*, 783–788.
- Chaney, J. M., Mullins, L. L., Wagner, J. L., Hommel, K. A., Page, M. C., & Doppler, M. J. (2004). A longitudinal examination of causal attributions and depression symptomatology in rheumatoid arthritis. *Rehabilitation Psychology*, *49*, 126–133. doi:10.1037/0090-5550.49.2.126
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, *98*, 310–357. doi:10.1037/0033-2909.98.2.310
- Covic, T., Tyson, G., Spencer, D., & Howe, G. (2006). Depression in rheumatoid arthritis patients: Demographic, clinical, and psychological predictors. *Journal of Psychosomatic Research*, *60*, 469–476. doi:10.1016/j.jpsychores.2005.09.011
- Coyne, J. C., Pepper, C. M., & Flynn, H. (1999). Significance of prior depression episodes of depression in two patient populations. *Journal of Consulting and Clinical Psychology*, *67*, 76–81. doi:10.1037/0022-006X.67.1.76
- Creed, F. (1990). Psychological disorders in rheumatoid arthritis: A growing consensus? *Annals of the Rheumatic Diseases*, *49*, 808–812. doi:10.1136/ard.49.10.808
- Demange, V., Guillemin, F., Baumann, M., Suurmeijer, T. P., Moum, T., Doeglas, D., . . . van den Heuvel, W. J. (2004). Are there more than cross-sectional relationships of social support and support networks with functional limitations and psychological distress in early rheumatoid arthritis? The European Research on Incapacitating Diseases and Social Support Longitudinal Study. *Arthritis and Rheumatism: Arthritis Care & Research*, *51*, 782–791. doi:10.1002/art.20694
- Dickens, C. (2001). The burden of depression in patients with rheumatoid arthritis. *Rheumatology*, *40*, 1327–1330. doi:10.1093/rheumatology/40.12.1327
- Dickens, C. (2002). Depression in rheumatoid arthritis: A systematic review of the literature with meta-analysis. *Psychosomatic Medicine*, *64*, 52–60.
- Dickens, C. (2003). Association of depression and rheumatoid arthritis. *Psychosomatics*, *44*, 209–215. doi:10.1176/appi.psy.44.3.209
- Doeglas, D., Suurmeijer, T., Briancon, S., Moum, T., Krol, B., Bjelle, A., . . . van den, H. W. (1996). An international study on measuring social support: Interactions and satisfaction. *Social Science & Medicine*, *43*, 1389–1397. doi:10.1016/0277-9536(96)00036-6
- Doeglas, D., Suurmeijer, T., Krol, B., Sanderman, R., van Rijswijk, M., & van Leeuwen, M. (1994). Social support, social disability, and psychological well-being in rheumatoid arthritis. *Arthritis & Rheumatism*, *7*, 10–15. doi:10.1002/art.1790070104
- Doeglas, D. M., Suurmeijer, T. P., van den Heuvel, W. J., Krol, B., van Rijswijk, M. H., van Leeuwen, M. A., & Sanderman, R. (2004). Functional ability, social support, and depression in rheumatoid arthritis. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation*, *13*, 1053–1065.
- Evers, A. W., Kraaimaat, F. W., Geenen, R., & Bijlsma, J. W. (1997). Determinants of psychological distress and its course in the first year after diagnosis in rheumatoid arthritis patients. *Journal of Behavioral Medicine*, *20*, 489–504. doi:10.1023/A:1025555600896
- Evers, A. W., Kraaimaat, F. W., Geenen, R., & Bijlsma, J. W. (1998). Psychosocial predictors of functional change in recently diagnosed rheumatoid arthritis patients. *Behaviour Research and Therapy*, *36*, 179–193. doi:10.1016/S0005-7967(98)00019-9
- Evers, A. W., Kraaimaat, F. W., Geenen, R., Jacobs, J. W., & Bijlsma, J. W. (2002). Longterm predictors of anxiety and depressed mood in early rheumatoid arthritis: A 3 and 5 year followup. *The Journal of Rheumatology*, *29*, 2327–2336.
- Folkman, S., & Moskowitz, J. T. (2004). Coping: Pitfalls and promise. *Annual Review of Psychology*, *55*, 745–774. doi:10.1146/annurev.psych.55.090902.141456
- Fyrand, L., Moum, T., Finset, A., & Glennås, A. (2002). The impact of disability and disease duration on social support of women with rheumatoid arthritis. *Journal of Behavioral Medicine*, *25*, 251–268. doi:10.1023/A:1015380711375
- Goldberg, D. P., & Hillier, V. F. (1979). A scaled version of the General Health Questionnaire. *Psychological Medicine*, *9*, 139–145. doi:10.1017/S0033291700021644
- Hewlett, S., Smith, A. P., & Kirwan, J. R. (2002). Measuring the meaning of disability in rheumatoid arthritis: The personal impact health assessment questionnaire (PI HAQ). *Annals of the Rheumatic Diseases*, *61*, 986–993. doi:10.1136/ard.61.11.986
- Holmbeck, G. N. (2002). Post-hoc probing of significant moderational and mediational effects in studies of pediatric populations. *Journal of Pediatric Psychology*, *27*, 87–96. doi:10.1093/jpepsy/27.1.87
- Jump, R. L., Robinson, M. E., Armstrong, A. E., Barnes, E. V., Kilbourn, K. M., & Richards, H. B. (2005). Fatigue in systemic lupus erythematosus: Contributions of disease activity, pain, depression, and perceived social support. *The Journal of Rheumatology*, *32*, 1699–1705.
- Katz, P. P., Morris, A., & Yelin, E. H. (2006). Prevalence and predictors of disability in valued life activities among individuals with rheumatoid arthritis. *Annals of the Rheumatic Diseases*, *65*, 763–769. doi:10.1136/ard.2005.044677
- Keefe, F. J., Smith, S. J., Buffington, A. L. H., Gibson, J., Studts, J. L., & Caldwell, D. S. (2002). Recent advances and future directions in the biopsychosocial assessment and treatment of arthritis. *Journal of Consulting and Clinical Psychology*, *70*, 640–655. doi:10.1037/0022-006X.70.3.640
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.
- Lok, E. Y. C., Mok, C. C., Cheng, C. W., & Cheung, E. F. C. (2010). Prevalence and determinants of psychiatric disorders in patients with rheumatoid arthritis. *Psychosomatics*, *51*, 338–338e8. doi:10.1176/appi.psy.51.4.338
- Martens, M. P. (2006). Development of a shortened center for epidemiological studies depression scale for assessment of depression in rheumatoid arthritis. *Rehabilitation Psychology*, *51*, 135–139.
- Nagyova, I., Benka, J., Chylova, M., Dijk Van, J. P., Dubayova, T., Havlikova, E., . . . Vargova, H. (2009). *Measuring health and quality of life in the chronically ill*. Košice, Slovak Republic: EQUILIBRIA.
- Neugebauer, A., & Katz, P. P. (2004). Impact of social support on valued activity disability and depressive symptoms in patients with rheumatoid arthritis. *Arthritis and Rheumatism*, *51*, 586–592.
- Neugebauer, A., Katz, P. P., & Pasch, L. A. (2003). Effect of valued activity disability, social comparisons, and satisfaction with ability on depressive symptoms in rheumatoid arthritis. *Health Psychology*, *22*, 253–262. doi:10.1037/0278-6133.22.3.253

- Olstad, R. (2001). The Finnmark Study. A prospective population study of the social support buffer hypothesis, specific stressors and mental distress. *Social Psychiatry and Psychiatric Epidemiology*, *36*, 582–589.
- Sheehy, C., Murphy, E., & Barry, M. (2006). Depression in rheumatoid arthritis - underscoring the problem. *Rheumatology*, *45*, 1325–1327. doi:10.1093/rheumatology/ke1231
- Smedstad, L. M., Moum, T., Vaglum, P., & Kvien, T. K. (1996). The impact of early rheumatoid arthritis on psychological distress. A comparison between 238 patients with RA and 116 matched controls. *Scandinavian Journal of Rheumatology*, *25*, 377–382. doi:10.3109/03009749609065649
- Stanton, A. L., Revenson, T. A., & Tennen, H. (2007). Health psychology: Psychological adjustment to chronic disease. *Annual Review of Psychology*, *58*, 565–592. doi:10.1146/annurev.psych.58.110405.085615
- Strating, M. M., Suurmeijer, T. P., & van Schuur, W. H. (2006). Disability, social support, and distress in rheumatoid arthritis: Results from a thirteen-year prospective study. *Arthritis and Rheumatism*, *55*, 736–744. doi:10.1002/art.22231
- Strating, M. M., van Schuur, W. H., & Suurmeijer, T. P. (2006). Contribution of partner support in self-management of rheumatoid arthritis individuals: An application of the theory of planned behavior. *Journal of Behavioral Medicine*, *29*, 51–60. doi:10.1007/s10865-005-9032-5
- Suurmeijer, T. P., Doeglas, D. M., Moum, T., Briancon, S., Krol, B., Sanderman, R., . . . van den Heuvel, W. J. (1994). The Groningen Activity Restriction Scale for measuring disability: Its utility in international comparisons. *American Journal of Public Health*, *84*, 1270–1273. doi:10.2105/AJPH.84.8.1270
- Suurmeijer, T. P. B. M., Van Sonderen, F. L. P., Krol, B., Doeglas, D. M., Van den Heuvel, W. J. A., & Sanderman, R. (2005). The relationship between personality, supportive transactions and support satisfaction, and mental health of individuals with early rheumatoid arthritis. Results from the Dutch part of the Euridiss Study. *Social Indicators Research*, *73*, 179–197. doi:10.1007/s11205-004-0562-y
- Szilasiová, A., Macejová, Z., Kovárová, M., Nagyová, I., Trejbal, D., Pramuk, I., & Beresová, A. (1998). The Groningen Activity Restriction Scale (GARS) in the evaluation of severity of rheumatoid arthritis. *Vnitřní Lekarství*, *44*, 195–200.
- Tretharne, G. J., Kitas, G. D., Lyons, A. C., & Booth, D. A. (2005). Well-being in rheumatoid arthritis: The effects of disease duration and psychosocial factors. *Journal of Health Psychology*, *10*, 457–474. doi:10.1177/1359105305051416

Received February 2, 2011

Revision received May 22, 2013

Accepted July 26, 2013 ■