

# A BIOPSYCHOSOCIAL PERSPECTIVE ON HEALTH-RELATED QUALITY OF LIFE IN RHEUMATOID ARTHRITIS



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## SUMMARY

*Background and aims:* Rheumatoid Arthritis (RA) is a chronic autoimmune inflammatory disease, often resulting in adverse physical, social, and psychological outcomes. This study aims to comprehensively examine the contribution of psychosocial variables to health-related quality of life in RA patients, after controlling for demographic and disease-related variables.

*Methods:* This is a cross-sectional study. Participants were 63 RA patients ages 20–67 recruited from two voluntary associations for rheumatic diseases in Israel. Assessments included socio-demographics and disease-related information, RAND-36 Health survey, Posttraumatic Growth Inventory, Hospital Anxiety and Depression Scale, Multidimensional Scale of Perceived Social Support, and Emotion Regulation Questionnaire. *Results:* In the fully adjusted regression models, pain severity, depression, income, and physical comorbidity were significant predictors of physical health-related quality of life, and pain severity and depression were significant predictors of mental health-related quality of life. The most potent predictor of physical health-related quality of life was pain severity. In predicting mental health-related quality of life, pain severity and depression were the primary predictors. *Discussion:* Findings support the application of a more comprehensive approach to RA management. Healthcare for RA patients should extend beyond traditional rheumatologic approaches to a comprehensive rehabilitative approach focusing on pain and depression. Pain and depression in RA may be best addressed by means of pharmacological treatment in conjunction with other therapies such as cognitive behavioral therapy and self-management interventions.

*Keywords:* Rheumatoid arthritis, health-related quality of life, depression, pain

## INTRODUCTION

Rheumatoid Arthritis (RA) is a chronic autoimmune inflammatory disease with a prevalence of approximately 0.5% to 1% in de-

veloped countries (see Gabriel & Michaud, 2009). RA is systemic disease predominantly characterized by persistent synovial joint inflammation (Firestein, 1996). The disease course of RA is usually progressive, often re-

sulting in high levels of disability and functional dependence (Lipsky, 2001). Since a causal treatment for RA is not yet available, RA treatment aims to reduce joint inflammation and pain, maximize joint function, diminish joint damage and prevent systemic involvement (Lipsky, 2001). Nonetheless, many RA patients are still afflicted with considerable functional limitations and pain (Pollard et al., 2005). RA manifestations also engender adverse social, cognitive (Krol et al., 1993; Lütze & Archenholtz, 2007) and psychological outcomes such as depression (Pollard et al., 2005). Thus, RA patients face multiple daily challenges, and the development of effective therapies is warranted (Fishman & Bar-Yehuda, 2010).

The term *health-related Quality of Life* (QoL) refers to the subjective assessment of the impact of disease and its treatment across physical, mental, social, and somatic domains of functioning and well-being (Nicassio et al., 2011). Significant impairments in health-related QoL in RA patients have been reported (e.g., Rupp et al., 2006; Tander et al., 2008). Highlighting the importance of health-related QoL in RA, it has been suggested that health-related QoL in RA determines treatment outcomes such as patients' demand for care, compliance levels, and satisfaction with treatment (Guillemin, 2000).

The biopsychosocial model of disease highlights the role of behavioral, psychological, and social factors (Engel, 1977). Accordingly, Engel's (1977) biopsychosocial model of disease takes into consideration factors contributing to illness and disease such as the patient's history, the social context in which the patient lives, and the complementary system devised by society to deal with the limiting elements of the disease. In doing so, the biopsychosocial model can

account for individual differences in disease experiences such as those displayed by RA patients with similar levels of physician-based disease status and joint damage (Nicassio et al., 2011). Indeed, in a study of the relationships between physical, psychological, and social factors and health-related QoL and disability among RA patients, findings indicated that psychosocial factors and self-reported disease activity were significant predictors of disability and health-related QoL, whereas physician-based disease activity scores did not correlate with any of these outcomes (Nicassio et al., 2011).

Numerous studies have examined the predictors of health-related QoL in RA patients. With regards to socio-demographics, in a review of 49 studies it was reported that older age, lower levels of education, lesser wealth, being unemployed, and female gender were significantly associated with lower health-related QoL in RA patients (Groessler et al., 2006). With regards to disease-related variables, pain and disease severity have been found to predict physical health-related QoL (Karimi et al., 2013; Lu et al., 2008), mental health-related QoL (Courvoisier et al., 2012), or both (Alishiri et al., 2008). Findings on the relationship between RA duration and health-related QoL are inconclusive (Lu et al., 2008; Rupp et al., 2006; West & Jonsson, 2005).

The relationship between depression, anxiety, and specific components of health-related quality of life (i.e., physical, mental) in RA is inconclusive. Some have reported associations between anxiety and depression and both physical and mental health-related QoL (Bazzichi et al., 2005; Ozcetin et al., 2007). However, others have associated mental health indicators (e.g., depression) with either physical health-related QoL (Alishiri et al., 2008) or mental health-related QoL

(Kojima et al., 2009; Rupp et al., 2006), but not with both. For example, in a study of Dutch RA patients, mental health-related QoL was significantly associated with depressive symptoms, and was significantly predicted by change in depressive symptoms at 2-year follow up, whereas no significant associations between physical health-related QoL and depressive symptoms were found (Rupp et al., 2006). These findings underscore the need to further investigate the contribution of depression and anxiety to specific components of health-related QoL in RA.

Social support has been long recognized a factor that positively and causally affects physical health, mental health, and longevity (see Thoits, 2011). Studies have shown that social support had a positive impact on RA patients' psychological and physical outcomes (Evers et al., 2003; Strating et al., 2006). Thus, social support may be associated with RA patients' health-related QoL. To our knowledge, studies of this association thus far related to individual aspects of health-related QoL and not to health-related QoL as a whole.

Emotion regulation processes enables individuals to affect how, when, and which emotions they experience and express (Gross, 1998b; Thompson, 1994). Cognitive reappraisal is an antecedent-focused strategy that intervenes before the emotion response has been fully produced (Gross & John, 2003). Expressive suppression is a response-focused strategy that is in use after the emotion has been generated and detected, involving inhibition of emotion-expression behavior (Gross, 1998a). Due to the unpredictable nature of flares and remissions in RA, emotion regulation skills may be important in maintaining QoL following periods of increased pain. Indeed, associations between emotion regulation strategies and variables related to

health-related QoL such as quicker recovery, pain, and social benefits have been reported (Connelly et al., 2007; Hamilton et al., 2005; van Middendorp et al., 2005). To our knowledge, no studies have examined the associations between emotion regulation strategies and health-related QoL as a whole in RA patients.

Posttraumatic growth is a cognitive process that is initiated to cope with traumatic events that impose an extreme cognitive and emotional burden (Tedeschi & Calhoun, 1998). Positive outcomes of posttraumatic growth include greater appreciation of life and recognizing new life-paths (Tedeschi & Calhoun, 1996). Being diagnosed with a major disease such as RA is often experienced as a traumatic event (Barskova & Oesterreich, 2009; Danoff-Burg & Revenson, 2005). Posttraumatic growth in RA patients has been associated with higher levels of function, increased positive mood, social support and pain reduction (Danoff-Burg & Revenson, 2005; Dirik & Karanci, 2008; Evers et al., 2001; Tennen et al., 1992). This suggests that posttraumatic growth may be associated with health-related QoL in RA. Evidence of the association between posttraumatic growth and health-related QoL as a whole is limited to a single study of cancer patients (see Barskova & Oesterreich, 2009; Schwarzer et al., 2006).

The objective of the present study is to examine health-related QoL in RA patients from a biopsychosocial perspective (Engel, 1977). Accordingly, health-related QoL will be examined, taking into account demographic variables, disease-related factors, and psycho-social variables in a sample of RA patients. While previous studies have examined the contribution of demographic, psychosocial, and disease-related variables to health-related QoL (e.g., Groessl et al., 2006;

Table 1. Participants' demographic and health characteristics (N = 63)

	M	SD
Demographics		
Age	43.56	14.19
Education (in years)	14.65	2.69
	n	%
Gender (female)	53	84.1
Income		
Much below average	19	30.2
Below average	21	33.3
Average	11	17.5
Above average	11	17.5
Much above average	1	1.6
Religious orientation		
Secular	42	66.7
Traditional	14	22.2
Religious	7	11.1
Health		
	M	SD
Years since RA diagnosis	9.25	9.88
Pain severity <sup>b</sup>	3.9	1.07
	n	%
Psychological comorbidity (no)	57	90.5
Psychological diagnosis		
Depression/anxiety	4	6.3
Posttraumatic Stress Disorder	2	3.2
Physical comorbidity (yes)	32	50.8

Rupp et al., 2006), a comprehensive examination of potential predictors of health-related QoL in RA is warranted. Novel aspects of the current investigation include the examination of the contribution of depression and anxiety to specific components of health-related QoL, and the associations between physical and mental components of health-related QoL, and perceived social support, emotion regulation strategies, and posttraumatic growth in RA patients. Understanding which factors affect mental and physical health-related QoL is expected to promote practitioners' ability to improve RA disease outcomes.

Based on the literature reviewed above, we hypothesize that among RA patients, after controlling for demographic and disease-related variables, health-related QoL would

be 1) positively associated with perceived social support, posttraumatic growth, and cognitive reappraisal; and 2) negatively associated with depression, anxiety, and expressive suppression.

## METHOD

### Participants and recruitment

Participants were 63 RA patients ages 20-67, and were mostly female (84.1%). Participants were recruited from two voluntary associations for rheumatic diseases in Israel, namely, „Young Joings“ ( $n = 44$ ) and „Inbar“ ( $n = 19$ ). Non-probability sampling was used. Participants' demographic and health characteristics are presented in *Table 1*.

## Procedure

The study was approved by the Ethical Committee of Eötvös Loránd University.

A cross-sectional survey design was used. We contacted the heads of two RA associations, who consented to contacting their members. During October to December, 2013, a recruitment ad was e-mailed on three occasions to organizations' members by their heads, and was posted on „Facebook“ page of „Young Joint“ association (visible to 499 members only). Of the 1,000 “Inbar” members contacted, 19 members agreed to participate. Forty-four “Young Joints” members were recruited by e-mail and Facebook. Overall, 63 participants completed self-administered assessments online after being informed in writing that participation is voluntary and anonymous.

### Measurements

*Socio-demographic information* included age, gender, years of education, income, and religious orientation.

*Disease-related information* included years elapsed since RA diagnosis, psychological and physical comorbidity (yes/no; specific diagnosis). *Perceived pain severity* was measured by two items rated on a 1 to 5 scale (none to severe, never to every day, respectively): 1. „during the past month, how would you describe the arthritis pain you usually had?“ (adopted from Meenan and Mason, 1992); and 2. „during the past month, how often did you have to take extra medication for your arthritis (in addition to your routinely medications)“. The total perceived pain severity score is the mean score of the two items.

*RAND 36-item health survey 1.0* (Hays et al., 1993) was used to assess health-related

QoL. The RAND is comprised of 36 items tapping health across eight domains including physical functioning (10 items; limited a lot, limited a little, not limited at all), physical role functioning (four items; yes/no), pain (two items on a 1-6 scale; e.g., „How much bodily pain have you had during the past 4 weeks?“), general health (five items on a 1-5 scale), energy/fatigue (four items on a 1-6 scale), social functioning (two items on a 1-5 scale), emotional role functioning (three items; yes/no), and emotional well-being (five items on a 1-6 scale). Scores on each domain are the sum of items' ratings. The first four domain scores are averaged to a Physical Component Score (PCS), and the latter four domain scores are averaged to a Mental Component Score (MCS). These scores are transformed into a domain score ranging 0 to 100, with a higher score representing higher levels of health-related QoL. An additional item taps health change and is not integrated into PCS or MCS scores. The items of the RAND 36-item health survey 1.0 and of the Medical Outcome Study Short-Form (SF-36; Ware Jr & Sherbourne, 1992) are identical, and so are scoring procedures excluding the domains of pain and general health. For the pain domain, a correlation of 0.99 between scores on the two instruments has been reported. Differences in scoring procedures of the general health domain had minimal effects in a longitudinal panel (Hays et al., 1993). Cronbach's alpha coefficients were 0.81 for PCS and 0.82 for MCS.

*Posttraumatic Growth Inventory* (PTGI; Tedeschi & Callhoun, 1996) was used to assess posttraumatic growth. It is comprised of 21 items tapping the degree to which specific positive changes are attributed to the struggle with trauma. We modified the PTGI to tap changes attributed to living with RA rather

than trauma in general. The PTGI taps the domains of relating to others (seven items), new opportunities (five items), personal strength (four items), spiritual change (two items), and appreciation for life (three items). A sample item is „I discovered that I am stronger than I thought I was“. Items are rated on a 0 („I did not experience this change as a result of my crisis“) to 5 („I experienced this change to a very great degree as a result of my crisis“) scale. The total score is the sum of ratings, ranging 0-105. Cronbach’s alpha was 0.93.

*Hospital Anxiety and Depression Scale* (HADS; Zigmond & Snaith, 1983) was used to assess anxiety and depression. The HADS is comprised of 14 items. Seven items comprise the anxiety scale (HADS-A; e.g., „I get a sort of frightened feeling like ‘butterflies’ in the stomach“) and seven items comprise the depression scale (HADS-D; „I have lost interest in my appearance“). Participants rated their feeling during the previous week on a scale from 0 to 3. The score of each subscale ranges 0-21 with a higher score representing higher levels of depression or anxiety. Subscales scores for depression and anxiety are the sum of the corresponding seven items. On each subscale, a score of 0–7 is classified as ‘non-cases’, a score of 8-10 indicates a possible clinical anxiety or depression, and a score >10 indicates a probable clinical anxiety or depression (Zigmond & Snaith, 1983). Cronbach’s alpha coefficients were 0.84 (HADS-A) and 0.77 (HADS-D).

*Multidimensional Scale of Perceived Social Support* (MSPSS; Zimet et al., 1988) was used to assess perceived social support. It is comprised of 12 items assessing the perceived availability and adequacy of instrumental and emotional social support from family (four items; e.g., “my family really tries to help me”), friends (four items), and

significant others (four items). Items are rated on a 1 (very strongly disagree) to 7 (very strongly agree) scale. The total score is the sum of all items ranging 12-84, with higher scores representing higher levels of perceived social support. Cronbach’s alpha was 0.93.

*Emotion Regulation Questionnaire* (ERQ; Gross & John, 2003) was used to assess emotion regulation strategies. It is comprised of 10 items tapping the typical use of expressive suppression (four items; e.g., “I keep my emotions to myself”) versus cognitive reappraisal (six items; e.g., “When I want to feel less negative emotion, I change the way I’m thinking about the situation”). Each item is rated on a scale of 1 (strongly disagree) to 7 (strongly agree). Cognitive reappraisal and expressive suppression scores is the mean score of the items on each scale, respectively. A higher score represents higher levels of each emotion regulation strategy. Cronbach’s alpha coefficients were 0.81 (cognitive reappraisal) and 0.72 (expressive suppression).

#### *Statistical analysis*

We conducted two hierarchical regression analyses, one with PCS health-related QoL and one with MCS health-related QoL as the dependent variable. The independent variables were chosen based on their correlations and theoretical association with the dependent variables and/ or the other research variables. Demographic and disease-related variables were entered in step 1 (categorical variables were transformed into dichotomous): age, pain severity, physical comorbidity, psychological comorbidity, income, religious orientation, and years since diagnosis. Next, research variables were entered: perceived social support (step 2); anxiety and depression (step 3); posttraumatic growth (step 4); and emotion regulation strategies (step 5).

Table 2. Means and standard deviations of the research variables (N = 63)

	M (SD)
Health-related quality of life	
Physical Component Score	39.07 (22.75)
Mental Component Score	51.82 (19.72)
Anxiety	8.37 (4.42)
Depression	6.25 (4.02)
Posttraumatic growth	40.75 (23.88)
Perceived social support	64.13 (15.04)
Emotion regulation	
Cognitive reappraisal	4.42 (1.29)
Expressive suppression	3.29 (1.44)

Table 3. Correlations between the research, demographic, and disease-related variables (N = 63)

	1	2	3	4	5	6	7	8	9
1. PCS	-								
2. MCS	0.80***	-							
3. Anxiety	-0.24†	-0.35**	-						
4. Depression	-0.59***	-0.62***	0.50***	-					
5. PTGI	0.17	0.16	-0.08	-0.23†	-				
6. MSPSS	0.29*	0.32*	-0.33**	-0.52***	0.24†	-			
7. Cognitive reappraisal	-0.01	-0.14	-0.06	-0.08	0.21†	0.16	-		
8. Expressive suppression	-0.04	-0.05	-0.01	0.15	-0.14	-0.38**	-0.02	-	
9. Age	0.31*	0.32*	-0.30*	-0.16	0.06	0.11	-0.04	0.02	-
10. Religious orientation <sup>a</sup>	0.30*	0.26*	-0.16	-0.25*	-0.07	0.41**	0.14	0.02	0.08
11. Income <sup>b</sup>	0.48**	0.44**	-0.18	-0.22†	-0.19	0.10	-0.35**	0.08	0.415**
12. Years since diagnosis	0.25*	0.20	-0.34**	-0.23†	0.21	0.14	0.13	0.06	-0.46***
13. Psychological comorbidity (1 = yes)	0.04	-0.06	0.08	-0.02	-0.27*	-0.07	-0.15	0.00	0.09
14. Physical comorbidity (1 = yes)	-0.20	-0.17	0.08	0.05	0.06	0.02	-0.03	-0.11	0.25*
15. Pain severity <sup>c</sup>	-0.77***	-0.66***	0.15	0.45**	-0.09	-0.21	0.08	-0.01	-0.23†

\*  $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ , †  $0.05 < p < 0.10$ .

PCS = Physical Component Score; MCS = Mental Component Score; PTGI = Posttraumatic Growth Inventory; MSPSS = Multidimensional Scale of Perceived Social Support.

Note. Categorical variables were transformed to dichotomous variables; a 0 = non-secular 1 = secular, b 0 = below average 1 = average or above, c Calculated as the standardized mean of reported pain severity and extra medications intake frequency

## RESULTS

### Descriptive statistics

Means and standard deviations of the research variables are presented in Table 2. Participants had a moderate mean MCS score and a low mean PCS score. Most of the par-

ticipants (56%) met criterion for classification as possible anxiety cases and approximately a third (32%) met criterion for classification as possible depression cases.

### Associations between research, demographic and disease-related variables

Correlations between the research, demographic, and disease-related variables are presented in Table 3.

Table 4. Hierarchical regression analysis predicting physical and mental health-related quality of life (N = 63)

	Step 1		Step 2		Step 3		Step 4		Step 5	
	PCS	MCS	PCS	MCS	PCS	MCS	PCS	MCS	PCS	MCS
	B									
Age	0.13	0.19	0.13	0.18	0.16d	0.19d	0.15	0.18†	0.14	0.20d
Pain severity	-0.63c	-0.54c	-0.62c	-0.51c	-0.51c	-0.39c	-0.50c	-0.39c	-0.51c	-0.38c
Physical comorbidity (1 = yes)	-0.14d	-0.13	-0.14d	-0.13	-0.16a	-0.13	-0.17a	-0.13	-0.17a	-0.14
Psychological comorbidity (1 = yes)	-0.02	-0.12	-0.01	-0.10	-0.03	-0.11	0.01	-0.09	0.01	-0.10
Income (1 = average or above)	0.16d	0.15	0.17d	0.16	0.16d	0.14	0.19a	0.15	0.21a	0.09
Religiousness (1 = secular)	0.12	0.10	0.08	0.03	0.09	0.04	0.11	0.05	0.11	0.09
Years since diagnosis	0.03	-0.02	0.03	-0.03	0.02	-0.07	-0.01	-0.09	-0.01	-0.07
Perceived social support	-	-	0.10	0.16	-0.02	-0.01	-0.04	-0.02	-0.07	-0.03
Anxiety	-	-	-	-	0.10	-0.03	0.08	-0.04	0.07	-0.03
Depression	-	-	-	-	-0.33b	-0.38b	-0.30b	-0.37b	-0.29b	-0.38b
Posttraumatic growth	-	-	-	-	-	-	0.12	0.07	0.11	0.08
Cognitive reappraisal	-	-	-	-	-	-	-	-	0.05	-0.14
Expressive suppression	-	-	-	-	-	-	-	-	-0.05	-0.02
R2	0.68	0.53	0.69	0.55	0.74	0.645	0.75	0.65	0.76	0.665

<sup>a</sup>  $p < 0.05$ , <sup>b</sup>  $p < 0.01$ , <sup>c</sup>  $p < 0.001$ , <sup>d</sup>  $0.05 < p < 0.10$ .

PCS = Physical Component Score; MCS = Mental Component Score

#### Regression analysis predicting PCS health-related quality of life

The fully adjusted model (step 5) accounted for 76% of the variance in PCS,  $F(13, 62) = 11.71$ ,  $p < 0.001$ . A significant negative association between PCS and depression was found ( $\beta = -0.29$ ,  $p < 0.01$ ). Significant negative associations were found between PCS and pain severity ( $\beta = -0.51$ ,  $p < 0.001$ ), and PCS and physical comorbidity ( $\beta = -0.17$ ,  $p < 0.05$ ). Higher income was positively associated with PCS on a statistically significant level ( $\beta = 0.21$ ,  $p < 0.05$ ) (Table 4).

#### Regression analysis predicting MCS health-related quality of life

The fully adjusted model (step 5) accounted for 66.5% of the variance in MCS,  $F(13, 62) = 7.47$ ,  $p < 0.001$ . A significant negative association was found between depression and MCS ( $\beta = -0.38$ ,  $p < 0.01$ ). A significant negative association was found between pain severity and MCS ( $\beta = -0.38$ ,  $p < 0.001$ ). Also, a marginally significant positive association between MCS and age ( $\beta = 0.20$ ,  $p = 0.076$ ) was found (Table 4).



## DISCUSSION

This study examined the associations between psycho-social factors and physical and mental health-related QoL in a sample of 63 Israeli RA patients. The fully adjusted models accounted for 76% and 66.5% of the variability in physical and mental health-related QoL, respectively. In the fully adjusted regression models, it was found that pain severity, depression, income, and physical comorbidity were significant predictors of physical health-related QoL, and that pain severity and depression were significant predictors of mental health-related QoL. The most potent predictor of physical health-related QoL was pain severity. In predicting mental health-related QoL, pain severity and depression were equally potent primary predictors. Secondary predictors of physical health-related QoL were income, physical comorbidity and depression.

Higher pain severity was significantly associated with lower physical and mental health-related QoL in the fully adjusted models. This finding corroborates previous evidence (Alishiri et al., 2008; Lu et al., 2008). The extent to which current RA treatments effectively reduce pain is inconclusive. While pharmacological RA treatments are mostly effective in decelerating patients' functional deterioration and the progression of joint damage (Aletaha et al., 2010), existing treatment of RA is insufficient in terms of pain relief from the patients' perspective (Taylor et al., 2010). Current findings highlight the need for more effective pain relief treatment in RA, which may result in improvement in patients' both physical and mental health-related QoL. One avenue for achieving this aim may be that of Cognitive Behavioral Therapy (CBT). Multiple studies have shown

that CBT interventions resulted in significant reductions in pain behavior and disease activity in patients with well-established RA. However, long-term effects of CBT on pain and its efficacy in patients with less established RA are unclear (see Bradley et al., 2003).

Depression was a significant negative predictor of both physical and mental health-related QoL in the fully adjusted models. This is in line with our hypothesis and with previous reports (Bazzichi et al., 2005; Ozcetin et al., 2007), and supports the notion that focusing on alleviating depression in RA treatment may be beneficial to patients' physical and mental health-related QoL. Due to our cross sectional design, causality in the relationship between depression and health-related QoL could not be inferred. While according to a growing consensus, the relationship between self-reported disability, pain and depression may be bidirectional in RA, the question of whether depression in RA patients is a reaction to the disease outcomes (e.g., disability, pain) or whether primary depression adds to the disease outcomes of RA warrants further investigation (Bazzichi et al., 2005). Various factors may contribute to the strong relationship between depression and pain (Walker et al., 1999). For example, elevated levels of proinflammatory cytokines (in RA) as well as disease-related psychosocial losses may contribute to depression (Chapman & Gavrin, 1999). Future longitudinal studies are needed in order to examine the causality of the relationship between depression and health-related QoL in RA.

No significant association was found between anxiety and either physical or mental health-related QoL after controlling for demographics, disease-related variables, and social support. This is in contrast to our

hypothesis. Nonetheless, anxiety was significantly associated with PCS and associated with MCS on a level approaching statistical significance prior to control for the above variables. Of the variables that were controlled, pain severity was the most potent predictor of health-related QoL. Accordingly, it may be that anxiety was not a significant predictor of health-related QoL after controlling pain severity because of shared variance with pain severity. Indeed, associations between dimensions of anxiety about pain (e.g., physiological anxiety, fear appraisal) and dimensions of functioning (e.g., emotional, social) have been reported in RA patients (Strahl et al., 2000). According to Strahl et al. (2000), several episodes of RA-related pain may create a conditioned emotional response in which pain triggers the physiological element of anxiety. This co-activation of pain and anxiety supports the above notion that these two constructs predict shared portions of the variance of health-related QoL in RA patients.

Perceived social support was significantly associated with physical and mental health-related QoL. However, in contrast to our hypothesis, this association did not persist after controlling for demographics and disease-related variables. Of the latter variables, pain severity was the most potent predictor of health-related QoL, which suggests shared variance between social support and pain severity. In line with this, it has been suggested that social support may function as coping assistance that engender more adaptive pain coping and less social withdrawal and thus positively affect long-term functional disability and pain (Thoits, 1986). Indeed, higher levels of social support consistently predicted lower pain levels in RA patients at 3- and 5-year follow-ups (Evers et

al., 2003). Future longitudinal investigations are needed in order to examine the associations between social support and health-related QoL in RA patients over time.

No significant association was found between posttraumatic growth and physical or mental health-related QoL. This is in contrast to our hypothesis, and to previous evidence on associations between posttraumatic growth and positive outcomes in RA (Danoff-Burg & Revenson, 2005; Dirik & Karanci, 2008; Evers et al., 2001; Tennen et al., 1992). Conversely, findings are in line with evidence from studies of various subpopulations of no association between benefit-finding and global QoL (Helgeson et al., 2006). Similarly, no significant associations between benefit finding and health-related QoL were reported in a longitudinal study of cancer patients (Schwarzer et al., 2006). However, in the same study, an increase in benefit finding between pre-surgery and 1-year follow-up predicted health-related QoL at 1-year follow-up (Schwarzer et al., 2006). Therefore, it may be that in order to detect the effect of posttraumatic growth on health-related QoL in RA, assessment across multiple points in time is needed.

No significant associations were found between emotion regulation strategies and either mental or physical health-related QoL. This is in contrast to our hypothesis. Of note, expressive suppression was negatively associated with perceived social support. This finding corroborates previous evidence on the beneficial effect of emotion regulation strategies (i.e., expression and control) on RA patients' social functioning (i.e., mutual visits, perceived support and actual support) (van Middendorp et al., 2005). Accordingly, it may be that emotion regulation strategies, though not directly associated with health-

related QoL, affect perceived social resources that may contribute to health-related QoL in RA patients.

Some methodological limitations are noteworthy. First, the sample was relatively small, which limits the effect sizes and generalizability. Second, participants were volunteers recruited from the community and thus may not represent RA patients from medical settings. Third, the online design required participants to be physically able to use a computer for approximately 25 minutes. Since joint function, mainly of the hands, is usually negatively affected in RA even in its early stages, findings may not generalize to RA patients with a severe disease status. Fourth, some items of the mental component of the RAND-36 overlap with the items of the depression scale in the current research. It might explain why other variables did not contribute to the explained variance of the mental component of the RAND-36 significantly. Fifth, the current study is cross sectional and undertaking a longitudinal perspective in future studies is warranted considering the progressive course of RA. Finally, future studies are needed in order to examine the possibility that there are complex relationships between the research variables in the current study that are not captured by its analytic design. These limitations notwithstanding, this study utilized a comprehensive framework for understanding health-re-

lated QoL in RA that included multiple novel aspects. Overall, findings suggest healthcare for RA patients should extend beyond traditional rheumatologic approaches to a comprehensive rehabilitative approach that focuses on patients' psychological and physical functioning.

The efficacy of current RA pain relief treatment is questionable (Taylor et al., 2010). Similarly, the efficacy of antidepressants in providing pain relief, decreasing depression and improving health-related QoL in RA is inconclusive (Richards et al., 2011). Additional avenues for achieving RA treatment gains include CBT interventions and RA-specific self-management programs. The former may engender physical benefits as well as manage depression in RA by thwarting negative illness perceptions and promoting a sense of control (Parker et al., 2003; Sharpe et al., 2003). Self-management programs aim to promote patients' sense of control of their disease and have demonstrated positive physical and psychological health outcomes (Barlow et al., 2000). Finally, nonpharmacological interventions such as exercise may yield functional benefits and reduce pain (Hurkmans et al., 2009). Pain and depression in RA may be best addressed by means of pharmacological treatment in conjunction with the above therapies. This study may be another important step towards improving RA patients' health-related QoL.

## ÖSSZEFOGLALÓ

AZ EGÉSZSÉGGEL ÖSSZEFÜGGŐ ÉLETMINŐSÉG BIOPSZICHOSZOCIÁLIS SZEMLÉLETE  
SOKÍZÜLETI GYULLADÁSBAN

*Háttér és célkitűzések:* A sokízületi gyulladás (rheumatoid arthritis; RA) egy olyan krónikus gyulladással autoimmun betegség, amely gyakran társul negatív fizikai, szociális és pszichológiai következményekkel. A vizsgálat célja, hogy feltárja, hogy a pszichoszociális változók milyen módon állnak kapcsolatban RA-ban az egészséggel kapcsolatos életminőséggel a demográfiai és betegséggel kapcsolatos jellemzők kontrollálása mellett. *Módszerek:* Vizsgálatunk keresztmetszeti jellegű volt, melyben 63, 20–67 év közötti sokízületi gyulladásban szenvedő beteg vett részt, akik két önkéntes alapon működő izraeli, reumatikus betegekkel foglalkozó szervezet tagjai voltak. Információt gyűjtöttünk a betegek szociodemográfiai és betegséggel kapcsolatos jellemzőire vonatkozóan, a kérdőívek közül pedig a *RAND-36 Health survey-t*, a *Posttraumatic Growth Inventory-t*, a *Hospital Anxiety and Depression Scale-t*, a *Multidimensional Scale of Perceived Social Support*-ot és az *Emotion Regulation Questionnaire-t* alkalmaztuk. *Eredmények:* Regressziós modellünkben a fájdalom súlyossága, a depresszió, a kereset és az egyéb szomatikus betegségekkel való komorbiditás bizonyultak a fizikai életminőség szignifikáns magyarázóváltozóinak, míg a fájdalom súlyossága és a depresszió a mentális életminőség szignifikáns magyarázóváltozóinak. A fizikai életminőség legerősebb magyarázóváltozója a fájdalom súlyossága, a mentális életminőségé pedig a fájdalom súlyossága és a depresszió voltak. *Megvitatás:* Eredményeink megerősítik, hogy átfogóbb megközelítésre van szükség a betegség kezelésében. Az RA betegek egészségügyi ellátása a tradicionális reumatológiai megközelítésen túl ki kell hogy terjedjen egy komplexebb, olyan rehabilitációs szempontokat is magába foglaló irányba, amely a fájdalomra és depresszióra fókuszál. A fájdalom és a depresszió kezelése sokízületi gyulladásban valószínűleg a farmakológiai kezelés és egyéb terápiás lehetőségek – mint kognitív viselkedés terápia, az önmenedzselést segítő intervenciók – kombinációjával válhat hatékonyabbá. *Kulcsszavak:* Rheumatoid arthritis, sokízületi gyulladás, egészséggel kapcsolatos életminőség, depresszió, fájdalom

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