

# Quality of life in Ecuadorian patients with established rheumatoid arthritis

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Maria Intriago  
Genessis Maldonado  
Jenny Cardenas  
Carlos Rios

Rheumatology Department, Universidad  
Espiritu Santo, Guayaquil, Ecuador

**Purpose:** To evaluate quality of life in patients with established rheumatoid arthritis (RA) and identify the factors that negatively affect it.

**Methods:** This was a cross-sectional study with patients with established RA from a rheumatology center in Ecuador. The RA Quality of Life (RAQoL) questionnaire was used to assess QoL and the Health Assessment Questionnaire — disability index (HAQ-DI) questionnaire for functional capacity. In addition, demographics, clinical characteristics, and markers of disease activity were included. Data were analyzed using SPSS 22.

**Results:** Of 186 patients, 89.8% were women, with a mean age of 51 years, 86.6% had symmetrical polyarticular involvement, 40.3% erosions, 46.8% morning stiffness, 46.8% xerophthalmia, and 39.2% fatigue. Depression was the most frequent comorbidity — 42.5%. The mean HAQ-DI score was 0.8, and 26.9% had functional disability. The mean RAQoL score was 7.2. Xerophthalmia, xerostomia, fatigue, morning stiffness, and depression were related to higher scores in the RAQoL ( $p < 0.05$ ). The mean RAQoL was higher in patients with more disease activity and comorbidities ( $p < 0.05$ ). Likewise, patients with functional disability had a mean RAQoL score of 15.6 versus 4.1 in patients without disability ( $p < 0.05$ ). There were positive correlations between RAQoL and ESR, CRP, painful-joint count, swollen-joint count, VAS of pain, and physician assessment ( $p < 0.05$ ).

**Conclusion:** QoL is severely affected in patients with RA. Depression, fatigue, morning stiffness, pain, high disease activity, and disability have a negative effect on QoL in RA. Likewise, patients with more comorbidities and extraarticular manifestations show worse QoL.

**Keywords:** rheumatoid arthritis, quality of life, RaQoL, Ecuador

## Introduction

Rheumatoid arthritis (RA) is a chronic autoimmune disease characterized by joint inflammation that can ultimately lead to destruction and deformity.<sup>1</sup> RA is also a systemic disease, and most patients have extraarticular manifestations, such as weight loss, nodules, and fatigue, among others.<sup>2</sup> Disease-modifying drugs help to control disease progression; however, quality of life (QoL) in patients with RA is still severely affected.<sup>3</sup> Haroon et al<sup>4</sup> showed that patients with RA have worse QoL compared to normal controls. Other studies have shown that quality of life in patients with RA is lower than that of patients with other inflammatory diseases such as psoriatic arthritis, ankylosing spondylitis and systemic lupus erythematosus.<sup>5,6</sup> Overall, the physical component of QoL is the most affected in RA due to bodily pain and limitations in physical functioning.<sup>5</sup>

Groessl et al<sup>7</sup> showed that female sex, lower level of education, low socio-economic status, being unemployed, and being single were significantly associated

Correspondence: Genessis Maldonado  
Rheumatology Department, Universidad  
Espiritu Santo, Km 2.5 Vía la Puntilla  
Samborondón, Guayaquil, Ecuador  
Tel +593 1 786 342 4976  
Email gcmaldonado@uees.edu.ec

with lower QoL in patients with RA. In a study by Minkin,<sup>8</sup> the most important predictors of QoL were pain severity and depression. Another study showed a correlation between QoL and disease activity, duration of disease, functional capacity, and radiological damage.<sup>9</sup> Bedi et al<sup>10</sup> demonstrated extra-articular manifestations have greater impact on QoL. Likewise, a greater number of comorbidities have been associated with worse QoL in patients with RA.<sup>11</sup>

There are several scales to assess QoL. The most commonly used are the European QoL — 5 Dimensions, the Nottingham Health Profile, and the Short Form 36 Survey.<sup>12–14</sup> These questionnaires are meant to be applied in the general population, as they are not sensitive to changes in the clinical status of patients with RA.<sup>15</sup> Conversely, the RAQoL questionnaire has shown good reliability and sensitivity to discriminate between groups with varying severity of disease activity.<sup>16</sup> This questionnaire is scored 0–30 based on dimensions that include energy, mobility, self-care, emotion, mood, and physical contact, with a lower score indicating better QoL.<sup>17</sup>

The importance of studying QoL in patients with RA lies in its relationship with health care–resource utilization. Ethgen et al<sup>18</sup> demonstrated that RA patients in the worst quarter of QoL reported an increase in rheumatologist visits, general practitioner visits, and hospitalization rates. For this reason, the aim of this study was to analyze QoL in patients with established RA and factors that negatively affect it. In this way, clinicians can target these factors and work with patients to improve their QoL and clinical outcomes.

## Methods

A cross-sectional study was carried out from January 2016 to January 2017. We included patients who attended a rheumatology center in the city of Guayaquil according to:

1. established diagnosis of RA according to the criteria of the American College of Rheumatology (1987)
2. age >18 years
3. agreement to participate in the study.

Patients with other inflammatory diseases or disabilities were excluded. Prior to participating in the study, patients provided written informed consent.

Data were collected using surveys that were filled out by the patients. The survey included demographics, characteristics of joint disease, VAS for pain, extra-articular

manifestations, comorbidities, and treatment. A rheumatologist examined the patients to complete information about swollen- and painful-joint counts, presence of erosions on radiography, presence of rheumatoid nodules, and a VAS for general physician assessment.

Patients' medical records were reviewed to obtain the most recent levels of CRP and erythrocyte-sedimentation rate (ESR). Using these data, we calculated the disease-activity score (DAS) 28 — ESR using the program DAS28 Calculator version 1.1, available online at [https://www.das-score.nl/das28/DAScalculators/DAS28\\_3VAR.html](https://www.das-score.nl/das28/DAScalculators/DAS28_3VAR.html). Remission was defined as a DAS28 score <2.6, low disease activity <3.2, moderate activity 3.2–5.1, and high activity >5.1.

We assessed QoL using the Spanish version of the RAQoL questionnaire.<sup>19</sup> In addition, patients filled out two more questionnaires: the Health Assessment Questionnaire — disability index (HAQ-DI)<sup>20</sup> to assess functional capacity and the Patient Health Questionnaire 9 (PHQ9)<sup>21</sup> to assess depression. Functional disability was defined as an HAQ-DI score >1.25. For the PHQ9, scores of 0–4 were considered normal, 5–9 mild depression, 10–14 moderate depression, 15–19 moderately severe depression, and 20–27 severe depression.

Data were analyzed using SPSS 22. Percentages, means, and SDs were obtained. We used ANOVA and Student's *t*-test to compare the mean RAQoL scores between groups. We used the Pearson correlation coefficient to assess the correlation between numerical variables, given normal distribution of the data, which was evaluated by the Kolmogorov–Smirnov test with Lilliefors correction. Statistical significance was set at <0.05.

## Results

A total of 186 patients completed the surveys: 89.8% were women and 10.2% men, with a mean age of 51±13.8 years. Regarding marital status, 49.5% patients were married, 17.2% free union, 16.1% single, 9.1% widow, and 8.1% divorced. Most patients (86%) came from urban areas. The main occupation was housework (52.7%), 42.5% had other jobs, and 4.8% didn't work, while 28% of patients were graduates, 11.3% undergraduates, and 60.7% had only school instruction.

Mean disease duration was 8.8±6.3 years. The main type of articular involvement was polyarticular symmetrical (86.6%) of patients, 40.3% were erosive, and 10.2% had rheumatoid nodules, while 46.8% were referred for morning stiffness >1 hour. Extra-articular manifestations

comprised xerophthalmia (46.8%), xerostomia (41.9%), fatigue (39.2%), loss of appetite (23.1%), weight loss (17.2%), fever (17.2%), and Raynaud's phenomenon 1.1%, while 87.1% of patients had some comorbidity, with a mean of  $2.3 \pm 1.6$  comorbidities per patient, 48.9% had dyslipidemia, 38.2% hypertension, 25.3% gastritis, 24.7% osteoporosis, 17.2% hypothyroidism, and 8.1% diabetes mellitus. Based on PHQ9 scores, 42.5% had depression.

The mean ESR was  $37.1 \pm 15.8$  mm/h and CRP  $14.5 \pm 12.8$  mg/L. The mean DAS28 score was  $3.1 \pm 1.4$ , and 42.5% patients were in remission, 16.7% had low disease activity, 33.9% moderate activity, and 7.0% high activity. As for other markers of disease activity, the mean painful-joint count was  $2 \pm 4$ , swollen joints  $2 \pm 4$ , VAS for pain  $3.4 \pm 2.8$ , and physician's assessment  $2.7 \pm 2.5$ .

Regarding treatment, 68.8% used steroids, 66.7% methotrexate, 49.5% nonsteroidal anti-inflammatory drugs, 15.6% hydroxychloroquine, 8.1% biologics, 7% sulfasalazine, and 4.8% leflunomide. The mean HAQ-DI score was  $0.8 \pm 0.8$  and mean RAQoL score  $7.2 \pm 7.8$ . The prevalence of functional disability was 26.9%. There were no significant differences in RAQoL scores in relation to demographics, as shown in Table 1.

Patients with erosive disease had a mean RAQoL score of  $9.6 \pm 8$ . In contrast, patients without erosions had a mean RAQoL score of  $5.6 \pm 6$  ( $p < 0.05$ ). Likewise, patients with morning stiffness  $> 1$  hour had a higher mean RAQoL score ( $8.5 \pm 8$ ) than those without morning stiffness ( $6.0 \pm 6$ ;  $p < 0.05$ ). We also found significant differences in RAQoL scores for xerophthalmia ( $8.5 \pm 8$  with vs  $5.9 \pm 7$  without,  $p < 0.05$ ), xerostomia ( $8.6 \pm 8$  with vs  $6.1 \pm 7$  without,  $p < 0.05$ ), fever ( $9.9 \pm 8$  with vs  $6.6 \pm 7$  without,  $p < 0.05$ ), and fatigue ( $9.9 \pm 8$  with vs  $5.4 \pm 6$  without,  $p < 0.05$ ).

RAQoL scores increased in relation to the number of comorbidities, as shown in Figure 1 ( $p < 0.05$ ). Patients with depression had a higher mean RAQoL score ( $12.4 \pm 8.7$ ) than those without depression ( $3.4 \pm 4.2$ ;  $p < 0.05$ ; Figure 2). RAQoL scores were higher in patients with higher disease activity (Figure 3). Patients in remission had a mean RAQoL score of  $3.7 \pm 5.2$  versus  $9.8 \pm 8.5$  for those with active disease ( $p < 0.05$ ). Patients with functional disability had a mean RAQoL score of  $15.6 \pm 8.3$  versus  $4.1 \pm 4.8$  in patients without disability ( $p < 0.05$ ). RAQoL scores also showed positive correlations with ESR, CRP, painful-joint count, swollen-joint count, VAS for pain and physician assessment ( $p < 0.05$ ).

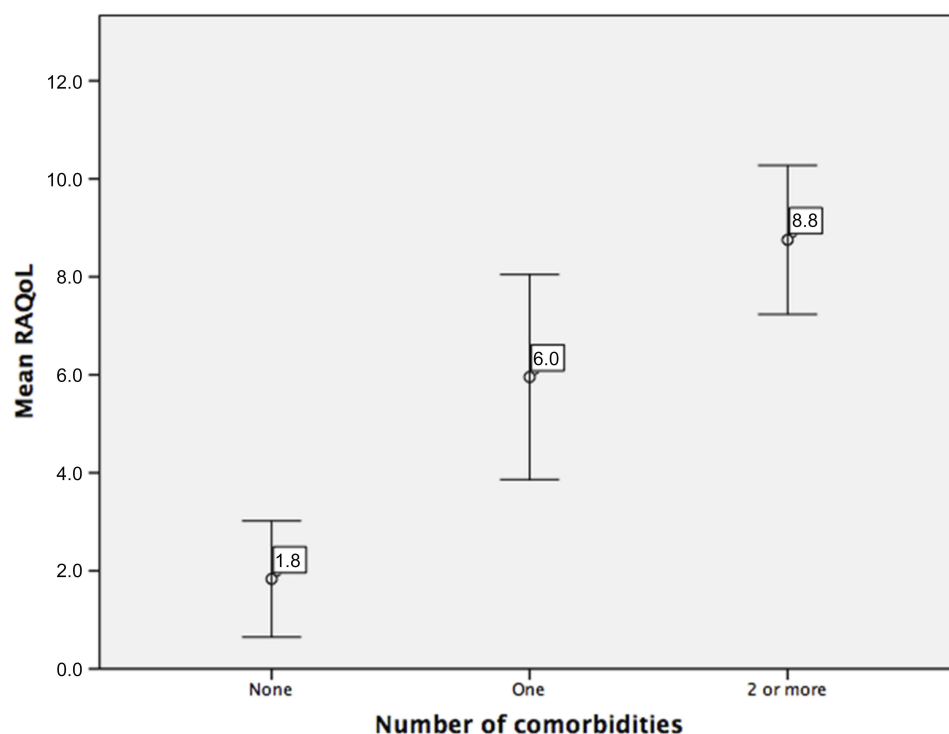
**Table 1** Mean RAQoL according to demographics

	Mean RAQoL $\pm$ SD
<b>Age (<math>p=0.073</math>)</b>	
Under 45 years	$5.4 \pm 6$
Between 45–60 years	$8.3 \pm 8$
Over 60 years	$7.7 \pm 8$
<b>Sex (<math>p=0.056</math>)</b>	
Male	$4.0 \pm 7$
Female	$7.5 \pm 6$
<b>Marital status (<math>p=0.771</math>)</b>	
Married	$6.8 \pm 6$
Free union	$6.3 \pm 6$
Single	$7.7 \pm 7$
Widow	$8.0 \pm 7$
Divorced	$9.2 \pm 8$
<b>Occupation (<math>p=0.289</math>)</b>	
Housework	$8.3 \pm 8$
Other job	$6.1 \pm 6$
Do not work	$5.3 \pm 7$
<b>Education (<math>p=0.533</math>)</b>	
School	$7.4 \pm 8$
Undergraduate	$8.7 \pm 9$
Graduate	$5.7 \pm 6$
<b>Area (<math>p=0.214</math>)</b>	
Urban	$7.4 \pm 7$
Rural	$5.4 \pm 7$
<b>Disease duration (<math>p=0.270</math>)</b>	
$< 5$ years	$6.2 \pm 7$
$\geq 5$ years	$7.6 \pm 7$

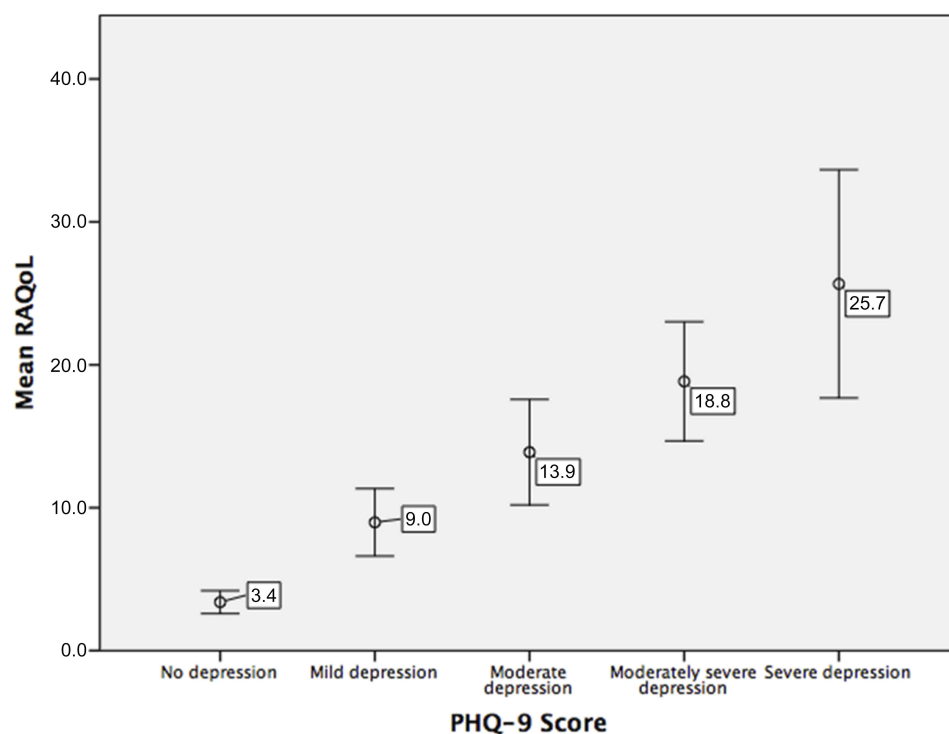
## Discussion

This study showed that QoL in patients with RA is affected by many factors, such as pain, disease activity, disability, depression, fatigue, extra-articular manifestations, and comorbidities, as shown in previous literature.<sup>7–11</sup> The mean RAQoL score in our population was similar to that found in another study carried out in Ecuador and in other studies from other Latin American countries.<sup>22–24</sup>

Though we did not find associations between demographics and QoL, other authors have. Aurrecoechea et al<sup>25</sup> found that women had worse QoL than men. This is not surprising, as women tend to experience more pain,<sup>26</sup> show higher disease activity,<sup>27</sup> and have higher rates of disability,<sup>28</sup> all of which influence QoL. Wallenius et al<sup>29</sup> reported that a higher level of education was associated with better QoL, which could illustrate the role of patient knowledge and understanding about their condition in their ability to cope



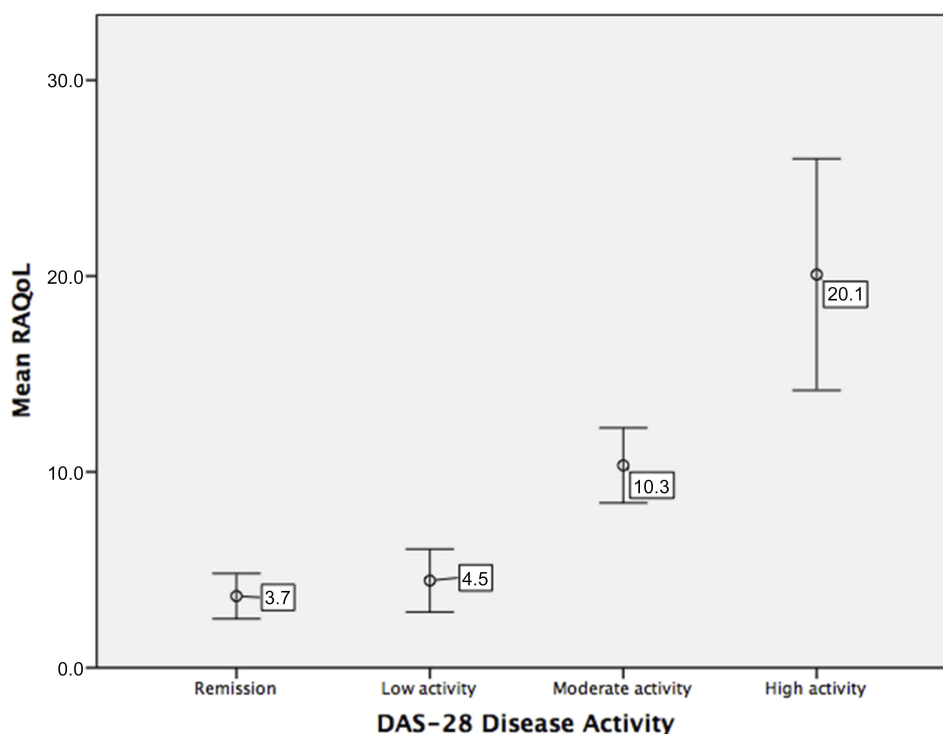
**Figure 1** RAQoL according to the number of comorbidities.



**Figure 2** RAQoL according to severity of depression.

with it. Purabdollah et al<sup>30</sup> reported a significant relationship between marital status and QoL, highlighting the role of social and family support in the management of the disease.

Likewise, Chorus et al<sup>31</sup> demonstrated that work positively influences QoL in patients with RA, as it can provide social support and distraction.



**Figure 3** RAQoL according to disease activity.

It has been established that physical function decreases with age<sup>32</sup> and that advanced age is related to lower QoL in patients with RA.<sup>33</sup> Conversely, Matcham et al<sup>34</sup> reported that higher mean age was associated with better QoL. This paradoxical association might be due to the impact that chronic diseases have on various aspects of life. Studies have shown that the effects of different diseases on work capacity, self-esteem, and maintenance of relationships are more debilitating to experience as a young adult.<sup>35,36</sup> Unfortunately, in this study we did not find any association with age.

A similar situation was found when analyzing the relation between disease duration and QoL. Several studies have linked longer disease duration with lower QoL.<sup>6,37</sup> Matcham et al<sup>34</sup> found the opposite association, which could be explained by the fact that patients who experience symptoms for a longer time have a higher level of acceptance of their condition. In patients with RA, illness acceptance has been associated with lower anxiety and depression, and pain acceptance has been associated with better well-being.<sup>38,39</sup>

Disease activity, pain, disability, and QoL are interconnected factors. Carr et al<sup>40</sup> found that pain was the most influential factor in QoL in RA patients, especially during

relapses. The pain accompanying RA contributes to patients becoming irritated, uncomfortable, anxious, and even isolated. Patients with higher disease activity usually have higher pain levels, which in turn is associated with higher rates of disability.<sup>41</sup> Marra et al<sup>42</sup> estimated that an increase of 0.25 in HAQ-DI score was associated with an increase of 2.0 on the RAQOL. The relationship between disability and QoL may be because patients with RA have greater physical dependence, which limits their ability to carry out normal activities and interact with their family, friends, and environment as they did before the disease.

The effect of comorbidities on QoL depends on the number and type of comorbid conditions. Ranganath et al<sup>11</sup> demonstrated that each comorbidity decreases QoL in patients with RA by 28%. In Rupp et al,<sup>43</sup> the comorbidities with greatest impact on QoL were gastrointestinal, pulmonary, and cardiovascular diseases. Ozcetin et al<sup>44</sup> showed that psychiatric disorders, such as depression and anxiety, also have a significant influence on QoL. In this study, depression was the only comorbidity with a significant impact on QoL. The factors that contribute to depression in patients with RA are pain, suffering from somatic symptoms, and functional limitations.<sup>45</sup> In turn, the presence of depression has been shown to be associated with worse health status and QoL.<sup>46</sup>



Many studies have analyzed QoL in patients with RA from a quantitative point of view, but very few have described QoL from the patient's point of view. Malm et al<sup>47</sup> conducted a qualitative study based on interviews with patients with RA to describe how individuals experience QoL. It was found that patients consider three main factors: independence, empowerment, and social participation. Patients considered that independence was the ability to maintain physical functionality without bodily symptoms. Empowerment included being able to manage situations of daily life, use strategies to take care of oneself, and learning to live with the disease. Patients also reported that in order to have good QoL, they needed to participate in different social contexts, belong to a family, and have friends. All these factors highlight the importance for patients with RA to have an active, independent life.

## Conclusion

QoL is severely affected in patients with RA. Depression, fatigue, morning stiffness, pain, disease activity, and disability have a negative effect on QoL in RA. Improvement in these factors plays an important role in improving QoL in RA. The RAQoL constitutes an adequate questionnaire in patients with RA, and could easily be implemented in regular rheumatologist visits. Clinicians should facilitate patients with psychological and social support, in order to improve clinical outcomes.

The main limitation of this study was that most studies on QoL used other questionnaires, such as the SF36. As these other questionnaires have different scales, it is difficult to compare scores with the RAQoL. In addition, there is still no cutoff point to define good or bad QoL using the RAQoL.

## Disclosure

The authors report no conflicts of interest in this work.

## References

- Helmick CG, Felson DT, Lawrence RC, et al. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part I. *Arthritis Rheum*. 2008;58(1):15–25. doi:10.1002/art.23794
- Maldonado-Cocco J, Citera G. *Reumatología*. 1era. Edic. *Azurras*. 2010;1:234–254.
- Smolen JS, Landewé R, Bijlsma J, et al. EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2013 update. *Ann Rheum Dis*. 2014;73(3):492–509. doi:10.1136/annrheumdis-2013-204573
- Haroon N, Aggarwal A, Lawrence A, Agarwal V, Misra R. Impact of RA on quality of life. *Mod Rheumatol*. 2007;17(4):290–295. doi:10.1007/s10165-007-0604-9
- Salaffi F, Carotti M, Gasparini S, Intorcchia M, Grassi W. The health-related quality of life in rheumatoid arthritis, ankylosing spondylitis, and psoriatic arthritis: a comparison with a selected sample of healthy people. *Health Qual Life Outcomes*. 2009;7:25. doi:10.1186/1477-7525-7-25
- Darvish N, Hadi N, Aflaki E, et al. Health-related quality of life in patients with systemic lupus erythematosus and rheumatoid arthritis compared to the healthy population in Shiraz, Iran. *Shiraz E-Med J*. 2017;18(3):e39075. doi:10.17795/senj39075
- Groessl E, Ganiats TG, Sarkin AJ. Sociodemographic differences in quality of life in rheumatoid arthritis. *Pharmacoeconomics*. 2006;24(2):109–121. doi:10.2165/00019053-200624020-00002
- Minkin T. A biopsychosocial perspective on health-related quality of life in rheumatoid arthritis. *Alkalmazott Pszichologia*. 2014;14(4):133–148.
- Garip Y, Eser F, Bodur H. Health-related quality of life in rheumatoid arthritis: comparison of RAQoL with other scales in terms of disease activity, severity of pain, and functional status. *Rheumatol Int*. 2011;31(6):769–772. doi:10.1007/s00296-009-1353-1
- Bedi GS, Gupta N, Handa R, Pal H, Pandey RM. Quality of life in Indian patients with rheumatoid arthritis. *Qual Life Res*. 2005;14:1953–1958. doi:10.1007/s11136-005-4540-x
- Ranganath VK, Maranian P, Elashoff DA, et al. Comorbidities are associated with poorer outcomes in community patients with rheumatoid arthritis. *Rheumatology (Oxford)*. 2013;52(10):1809–1817. doi:10.1093/rheumatology/ket224
- Augustovski FA, Irazola VE, Velazquez AP, Gibbons L, Craig BM. Argentine valuation of the EQ-5D health states. *Value Health*. 2009;12(4):587–596. doi:10.1111/j.1524-4733.2008.00468.x
- Houssien DA, McKenna SP, Scott DL. The nottingham health profile as a measure of disease activity and outcome in rheumatoid arthritis. *Br J Rheumatol*. 1997;36(1):69–73.
- Augustovski FA, Lewin G, Elorrio EG, Rubinstein A. The Argentine-Spanish SF-36 health survey was successfully validated for local outcome research. *J Clin Epidemiol*. 2008;61(12):1279–1284. doi:10.1016/j.jclinepi.2008.05.004
- Cooper JK, Kohlmann T, Michael JA, Haffer SC, Stevic M. Health outcomes. New quality measure for medicare. *Int J Qual Health Care*. 2001;13(1):9–16. doi:10.1093/intqhc/13.1.9
- Whalley D I, McKenna SP, de Jong Z, van der Heijde D. Quality of life in rheumatoid arthritis. *Br J Rheumatol*. 1997;36(8):884–888.
- Tijhuis GJ I, de Jong Z, Zwinderman AH, et al. The validity of the Rheumatoid Arthritis Quality of Life (RAQoL) questionnaire. *Rheumatology (Oxford)*. 2001;40(10):1112–1119. doi:10.1093/rheumatology/40.10.1112
- Ethgen O, Kahler KH, Kong SX, Reginster J, Wolfe F. The effect of health-related quality of life on reported use of health care resources in patients with osteoarthritis and rheumatoid arthritis: a longitudinal analysis. *J Rheumatol*. 2002;29:1147–1155.
- Pacheco-Tena C, Reyes-Cordero G, McKenna SP, et al. Adaptation and validation of the Rheumatoid Arthritis Quality of Life Scale (RAQoL) to Mexican Spanish. *Reumatol Clin*. 2011;7(2):98–103. doi:10.1016/j.reuma.2010.02.002
- Cardiel M, Abello-Banfi M, Ruiz-Mercado R, Alarcon-Segovia D. How to measure health status in rheumatoid arthritis in non-english speaking patients: validation of a Spanish version of the Health Assessment Questionnaire Disability Index (Spanish HAQ-DI). *Clin Exp Rheumatol*. 1993;11(2):117–121.
- Diez-Quevedo C, Rangil T, Sánchez-Planell L, Kroenke K, Spitzer R. Validation and utility of the patient health questionnaire in diagnosing mental disorders in 1003 general hospital Spanish inpatients. *Psychosom Med*. 2001;63(4):679–686.

22. Cruz-Castillo Y, Montero N, Salazar-Ponce R, et al. Calidad de vida en pacientes ecuatorianos con artritis reumatoide: un estudio transversal. *Reumatol Clin*. 2017. doi:10.1016/j.reuma.2017.08.012
23. Prada DM, Hernández C, Gómez JA, et al. Evaluación de la calidad de vida relacionada con la salud en pacientes con artritis reumatoide en el Centro de Reumatología. *Rev Cuba Reum*. 2015;17:48–60.
24. Vinaccia S, Fernández H, Moreno E, Pedro S, Padilla GV. Aplicación de la versión española del cuestionario Quality of life Measure for Rheumatoid Arthritis (QOL-RA) en Colombia. *Rev Colomb Reumatol*. 2006;13:264–270.
25. Aurrecochea E, Ilorcadiaz J, Diezlizuain ML, McGwin G, Calvo-alen J. Impact of gender in the quality of life of patients with rheumatoid arthritis. *J Arthritis*. 2015;4:160. doi:10.4172/2167-7921.1000160
26. Bingefors K, Isacson D. Epidemiology, co-morbidity, and impact on health-related quality of life of self-reported headache and musculoskeletal pain—a gender perspective. *Eur J Pain*. 2004;8(5):435–450. doi:10.1016/j.ejpain.2004.01.005
27. Intriago M, Maldonado G, Cárdenas J, Ríos C. Clinical characteristics in patients with rheumatoid arthritis: differences between genders. *Sci World J*. 2019. doi:10.1155/2019/8103812
28. Karpouzas GA, Dolatabadi S, Moran R, Li N, Nicassio PM, Weisman MH. Correlates and predictors of disability in vulnerable US Hispanics with rheumatoid arthritis. *Arthritis Care Res*. 2012;64:1274–1281. doi:10.1002/acr.v64.9
29. Wallenius M, Skomsvoll JF, Koldingsnes W, et al. Comparison of work disability and health-related quality of life between males and females with rheumatoid arthritis below the age of 45 years. *Scand J Rheumatol*. 2009;38(3):178–183. doi:10.1080/03009740802400594
30. Purabdollah M, Lakdzaji S, Rahmani A, Hajalilu M, Ansarin K. Relationship between sleep disorders, pain and quality of life in patients with rheumatoid arthritis. *J Caring Sci*. 2015;4(3):233–241. doi:10.15171/jcs.2015.024
31. Chorus AM, Miedema HS, Boonen A, Van Der Linden S. Quality of life and work in patients with rheumatoid arthritis and ankylosing spondylitis of working age. *Ann Rheum Dis*. 2003;62(12):1178–1184. doi:10.1136/ard.2002.004861
32. Hillsdon MM, Brunne EJ, Guralnik JM, Marmot MG. Prospective study of physical activity and physical function in early old age. *Am J Prev Med*. 2005;28:245–250. doi:10.1016/j.amepre.2004.12.008
33. Jakobsson U, Hallberg IR. Pain and quality of life among older people with rheumatoid arthritis and/or osteoarthritis: a literature review. *J Clin Nurs*. 2002;11(4):430–443.
34. Matcham F, Scott IC, Rayner L, et al. The impact of rheumatoid arthritis on quality-of-life assessed using the SF-36: a systematic review and meta-analysis. *Semin Arthritis Rheum*. 2014;44(2):123–130. doi:10.1016/j.semarthrit.2014.05.001
35. Schane RE, Woodruff PG, Dinno A, Covinsky KE, Walter LC. Prevalence and risk factors for depressive symptoms in patients with chronic obstructive pulmonary disease. *J Gen Intern Med*. 2008;23:1757–1762. doi:10.1007/s11606-007-0501-0
36. Kay C, Davies J, Gamsu D, Jarman M. An exploration of the experiences of young women living with type I diabetes. *J Health Psychol*. 2009;14:242–250. doi:10.1177/1359105308100208
37. Monjamed Z, Varaci SH, Kazemnejad A, Razavian F. Quality of life in rheumatoid arthritis patients. *J Hayat*. 2007;13(3):57–66.
38. Barlow JH, Cullen LA, Rowe IF. Comparison of knowledge and psychological well-being between patients with a short disease duration ( $\leq 1$  year) and patients with more established rheumatoid arthritis ( $\geq 10$  years duration). *Patient Educ Couns*. 1999;38(3):195–203. doi:10.1016/S0738-3991(98)00144-X.
39. Viane I, Crombez G, Eccleston C, et al. Acceptance of pain is an independent predictor of mental well-being in patients with chronic pain: empirical evidence and reappraisal. *Pain*. 2003;106:65–72. doi:10.1016/S0304-3959(03)00291-4
40. Carr A, Hewlett S, Hughes R, et al. Rheumatology outcomes: the patient's perspective. *J Rheumatol*. 2003;30:880–883.
41. Hakkinen A, Kautiainen H, Hannonen P, Ylinen J, Arkela-Kautiainen M, Sokka T. Pain and joint mobility explain individual subdimensions of the health assessment questionnaire (HAQ) disability index in patients with rheumatoid arthritis. *Ann Rheum Dis*. 2005;64(1):59–63. doi:10.1136/ard.2003.019935
42. Marra CA, Woolcott JC, Kopec JA, et al. A comparison of generic, indirect utility measures (the HUI2, HUI3, SF-6D, and the EQ-5D) and disease-specific instruments (the RAQoL and the HAQ) in rheumatoid arthritis. *Soc Sci Med*. 2005;60(7):1571–1582. doi:10.1016/j.socscimed.2004.08.034
43. Rupp I, Boshuizen HC, Jacobi CE, Dinant HJ, Bos G. Comorbidity in patients with rheumatoid arthritis: effect on health-related quality of life. *J Rheumatol*. 2004;31:58–65.
44. Ozcetin A, Ataoglu S, Kocer E, et al. Effects of depression and anxiety on quality of life of patients with rheumatoid arthritis, knee osteoarthritis and fibromyalgia syndrome. *West Indian Med J*. 2007;56(2):122–129.
45. Geenen R, Newman S, Bosseman E, Vriezckolk J, Boelen P. Psychological interventions for patients with rheumatic diseases and anxiety or depression. *Best Pract Res Clin Rheumatol*. 2012;26(3):305–319. doi:10.1016/j.berh.2012.05.004
46. Maldonado G, Ríos C, Paredes C, et al. Depresión en artritis reumatoide. *Revista Colombiana De Reumatología*. 2017;24(2):84–91. doi:10.1016/j.rcreu.2016.12.001
47. Malm K, Bergman S, Andersson M, Bremander A, Larsson I. Quality of life in patients with established rheumatoid arthritis: a phenomenographic study. *SAGE Open Med*. 2017. doi:10.1177/2050312117713647

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