

# The relationship between disease activity, quality of life, and psychological status in patients with rheumatoid arthritis: A cross-sectional study

Romatoid artritli hastalarda hastalık aktivitesi, yaşam kalitesi ve psikolojik durum arasındaki ilişki: Kesitsel bir çalışma

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## Abstract

**Objective:** Rheumatoid arthritis (RA) is a chronic, progressive inflammatory disorder predominantly affecting peripheral joints. Beyond its articular involvement, RA imposes substantial physical limitations and emotional challenges, adversely impacting patients' quality of life and contributing to a significant socioeconomic burden. This study was conducted to investigate the associations among disease activity, pain intensity, psychological well-being, and quality of life in individuals diagnosed with RA.

**Methods:** In this retrospective cross-sectional study, 64 patients fulfilling the 2010 American College of Rheumatology/European League Against Rheumatism classification criteria for RA were included. Disease activity was quantified using the disease activity score-28, and pain was assessed through the visual analog scale (VAS). Health-related quality of life was evaluated using the short form-12 (SF-12), which generates physical component summary (PCS) and mental component summary (MCS) scores. Participants were categorized based on disease activity levels, and the impact of both treatment modality and clinical response on quality of life was examined.

**Results:** The average age of the study population was 56.1 years (standard deviation  $\pm 11.82$ ). Most patients (71.9%) were receiving conventional disease-modifying antirheumatic drugs, while 18.8% were treated with biological agents. Patients with moderate to high disease activity exhibited significantly lower SF-12 PCS and MCS scores ( $p < 0.001$ ). VAS pain scores were substantially elevated in those with higher disease activity levels ( $p < 0.001$ ). Furthermore, a strong correlation was observed between psychological status, pain severity, and overall quality of life ( $p < 0.001$ ).

## Özet

**Amaç:** Romatoid artrit (RA), genellikle periferik eklemleri etkileyen, enflamatuvar, kronik ve ilerleyici bir hastalıktır. Prevalansı dünya genelinde %0,25 ile %1 arasında değişmekte olup, kadınlar erkeklerle göre 2-3 kat daha fazla etkilenmektedir. RA, önemli fiziksel ve duygusal engellerle ilişkilidir ve yaşam kalitesinde azalmaya yol açarak yüksek sosyoekonomik yük oluşturur. Erken tedavi edilmezse geri dönüşümsüz hasarlara neden olabilir. Bu çalışma, RA hastalarında hastalık aktivitesi, ağrı, psikolojik durum ve yaşam kalitesi arasındaki ilişkiyi değerlendirmeyi amaçlamaktadır.

**Yöntem:** Bu kesitsel çalışma, 2010 Amerikan Romatoloji Koleji/ Romatizmaya Karşı Avrupa Birliği tanı kriterlerine göre RA tanısı almış 64 hastayı içermektedir. Hastalık aktivitesi, hastalık aktivite skoru-28 ile, ağrı ise görsel analog ölçeği (GAÖ) ile ölçüldü. Yaşam kalitesi değerlendirilmesi için kısa form-12 (SF-12) ile hem fiziksel bileşen özeti (PCS) hem de zihinsel bileşen özeti (MCS) elde edildi. Hastalar hastalık aktivitesine göre gruplandırılarak tedavi ve hastalık yanıtlarının yaşam kalitesine etkileri analiz edildi.

**Bulgular:** Katılımcıların ortalama yaşı 57,5 yıl (minimum: 22, maksimum: 82) olup, hastaların %76,6'sı kadındı ve %23,4'ü erkekti. Hastaların çoğu (%71,9) hastalığı modifiye eden ajanlar kullanırken, %18,8'i biyolojik tedavi alıyordu. Yaşam kalitesi, SF-12 ile değerlendirildiğinde, orta ve yüksek hastalık aktivitesine sahip hastalarda ( $p < 0,001$ ) fiziksel ve zihinsel sağlık skorları anlamlı derecede düşük bulundu. GAÖ ile ölçülen ağrı, hastalık aktivitesi yüksek olan hastalarda belirgin şekilde daha yüksekti ( $p < 0,001$ ). Psikolojik durum, ağrı ve genel yaşam kalitesi ile güçlü bir şekilde ilişkilirdi ( $p < 0,001$ ).

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## Abstract

**Conclusion:** These findings underscore the importance of addressing both pain and psychological well-being in RA management. Improving quality of life requires more than symptom control-it necessitates a comprehensive and multidisciplinary therapeutic approach tailored to the physical and emotional needs of patients.

**Keywords:** Rheumatoid arthritis, quality of life, disease activity, SF-12, VAS

## Introduction

Rheumatoid arthritis (RA) is a chronic, progressive autoimmune condition that primarily targets the peripheral joints.<sup>[1]</sup> The global prevalence of RA exhibits notable variability, ranging from approximately 0.25% to 1%.<sup>[2]</sup> Although it is more frequently observed in individuals over 40 years of age, the disease can manifest at any age. Women are disproportionately affected, with incidence rates reported to be two to three times higher than in men.<sup>[3]</sup>

RA is marked by both articular involvement and systemic manifestations, which are thought to result from a complex interaction of genetic predisposition and environmental influences. Clinically, it typically presents as a symmetrical, erosive polyarthritis, predominantly involving the small joints of the hands and feet. Key features often include morning stiffness exceeding one hour, rest-related joint pain, visible swelling, deformities, reduced mobility, and consequently, a decline in quality of life (QoL).<sup>[1]</sup> In the absence of effective treatment, up to 80-85% of patients may develop chronic joint pain, structural damage, and systemic complications. This progression is commonly associated with increased morbidity, reduced life expectancy, and substantial socioeconomic consequences.<sup>[4]</sup>

According to the World Health Organization, health-related QoL (HRQoL) reflects an individual's perceived position in life, contextualized by their cultural setting, value system, goals, expectations, and social environment. This multidimensional concept encompasses physical health, psychological well-being, functional independence, interpersonal relationships, spiritual beliefs, and environmental factors.<sup>[4]</sup> The general negative impacts of RA significantly affect patients' QoL.<sup>[5]</sup> Studies have shown that RA has substantial effects on both physical and mental health, affirming that QoL should be a critical goal in RA management.<sup>[6]</sup>

The short form-12 (SF-12) health survey is a widely utilized, abridged instrument for assessing health status, offering physical and mental health summary scores. As a streamlined version of the SF-36, it allows for more efficient health evaluations in clinical and research settings.<sup>[7]</sup> The

## Öz

**Sonuç:** Çalışmamız, RA hastalarının yaşam kalitesini iyileştirmede ağrı yönetimi ve psikolojik desteğin kritik bir rol oynadığını ortaya koymaktadır. Sonuçlar, hastalık aktivitesinin yalnızca fiziksel semptomların kontrol altına alınmasıyla iyileşemeyeceğini, bütüncül bir tedavi yaklaşımının gerektiğini vurgulamaktadır.

**Anahtar Kelimeler:** Romatoid artrit, yaşam kalitesi, hastalık aktivitesi, SF-12, VAS

visual analog scale (VAS), on the other hand, is employed to quantify subjective symptoms such as pain and discomfort.

For optimal treatment guidance in RA, the use of standardized composite indices is preferred over isolated clinical judgments or single variables. The disease activity score-28 (DAS-28) and clinical disease activity index are the primary tools recommended by the American College of Rheumatology (ACR) and the European League Against Rheumatism (EULAR) for routine practice.<sup>[8]</sup> DAS-28 integrates tender and swollen joint counts, acute phase reactants, and patient global health assessments into a continuous metric of disease activity.

The present study aims to examine the influence of disease activity on both QoL and psychological status in individuals with RA. For this purpose, disease activity will be assessed using the DAS-28, while general well-being will be evaluated through SF-12 and VAS scores. Additionally, the study seeks to explore the relationship between disease control, treatment response, and daily functional capacity.

## Materials and Methods

### Study Design and Patient Selection

This study utilized a retrospective cross-sectional design. Individuals aged 18 years and older who had been diagnosed with RA and were under follow-up at the rheumatology outpatient clinic were evaluated. A total of 64 patients who agreed to participate and completed the questionnaire during face-to-face interviews with the rheumatology specialist were included in the final analysis. Data regarding comorbidities such as hypertension (HT), diabetes mellitus (DM), asthma, and coronary artery disease were extracted from patient medical records and assessed accordingly.

Inclusion criteria comprised patients fulfilling the 2010 classification criteria of the ACR and the EULAR for RA,<sup>[9]</sup> who had been receiving regular treatment and follow-up care for at least six months, and who provided informed consent to complete the survey. Exclusion criteria involved patients who did not meet the 2010 ACR/EULAR criteria, those diagnosed with concomitant autoimmune conditions (e.g.,



overlap syndromes, primary Sjögren's syndrome, systemic sclerosis, inflammatory myopathies), individuals under the age of 18, those who refused to participate in the survey, and those with severe cognitive or psychiatric disorders that could impair their ability to respond. Additionally, patients with active infections, malignancies, or severe organ dysfunction (e.g., advanced heart failure or end-stage renal disease) were excluded from the study.

The study received ethical approval from the Ethics Committee of Kırıkkale University (approval number: 19, dated: 09.04.2025) and was conducted in compliance with the ethical principles outlined in the 1964 Declaration of Helsinki and its subsequent revisions.

### Data Collection

Demographic and clinical information was obtained through structured face-to-face interviews and a review of patient medical records. Recorded variables included age, sex, comorbid conditions, disease duration, and perceived overall QoL.

Disease activity was evaluated using the DAS-28, while pain intensity over the preceding week was assessed via the VAS. HRQoL was measured using the SF-12 questionnaire, which provides both a mental component score (SF-12 mental) and a physical component score (SF-12 physical).

Considering the potential influence of disease activity on QoL, participants were stratified into two groups based on DAS-28 scores. Group 1 comprised patients in remission or with low disease activity (DAS-28  $\leq 3.2$ ), whereas group 2 included those exhibiting moderate to high disease activity (DAS-28  $> 3.2$ ). This classification facilitated the comparison of clinical and QoL outcomes across disease activity levels.

### Statistical Analysis

All statistical procedures were conducted using IBM SPSS Statistics for Windows, version 22.0 (IBM Corp., Armonk, NY, USA). The distributional characteristics of continuous variables were examined through the Shapiro-Wilk test, complemented by visual assessments including histograms and Q-Q plots. As the distributions of DAS-28, SF-12 mental, and SF-12 physical scores deviated from normality, non-parametric statistical methods were employed for subsequent analyses.

Descriptive statistical methods were applied to summarize the demographic profiles and clinical characteristics of the study population. Categorical variables -such as sex, presence of comorbidities, and types of pharmacological treatment- were presented as frequencies and percentages. Continuous variables, including age and disease duration, were reported

using measures of central tendency and dispersion, such as means, medians, ranges, and standard deviations.

To evaluate the association between treatment modalities and disease activity categories (based on DAS-28 scores), the chi-square ( $\chi^2$ ) test was utilized. Given the non-normal distribution of disease activity data, the Mann-Whitney U test was applied to compare DAS-28 scores across different treatment groups.

The relationship between disease duration and disease activity was examined using Spearman's rank-order correlation, owing to the ordinal characteristics of the variables involved. Additionally, comparisons of QoL scores (SF-12 physical and mental components) between DAS-28-defined activity groups were performed using the Mann-Whitney U test, as the data did not meet normality assumptions.

The association between VAS pain scores and disease activity was analyzed using Spearman's rank-order correlation. Similarly, the relationship between age and QoL was examined using Spearman's correlation, based on the distributional properties of the variables.

The effects of gender and employment status on QoL scores were evaluated using independent samples t-tests when normality assumptions were met, and Mann-Whitney U tests when data deviated from normal distribution.

Patient satisfaction with treatment and their psychological status were also assessed. For categorical variables such as satisfaction levels and psychological well-being, descriptive statistics -namely frequencies and percentages- were reported. The correlation between psychological well-being and VAS pain scores was further analyzed using Spearman's correlation, in accordance with the distribution of the data.

All analyses were performed using SPSS software (version 22), and statistical significance was defined as  $p < 0.05$ .

## Results

### Demographic Characteristics

A total of 64 patients were included, with a mean age of 56.1 years (standard deviation  $\pm 11.82$ ). Of the patients, 49 (76.6%) were female and 15 (23.4%) were male. Patients were categorized into four groups based on disease duration. Accordingly, 12 patients (18.8%) had been diagnosed with RA within the past year, 19 patients (29.7%) had a disease duration between 1 and 5 years, 7 patients (10.9%) had a duration between 5 and 10 years, and 26 patients (40.6%) had been diagnosed more than 10 years ago. A family history of rheumatic diseases was present in 22 patients (34.4%). At least one



comorbidity was identified in 34 patients (53.1%) (Table 1). The most common comorbid condition was HT, present in 20 patients (58.8% of those with comorbidity), followed by DM in 12 patients (35.3%), asthma in 9 patients (26.5%), and coronary artery disease in 5 patients (14.7%).

### Disease Characteristics and Quality of Life

An evaluation of the pharmacological treatments currently administered revealed that 46 patients (71.9%) were being treated exclusively with conventional disease-modifying antirheumatic drugs (DMARDs). A total of 12 patients (18.8%) were receiving biological therapies, which included agents targeting CD20, tumor necrosis factor-alpha, interleukin-6, or Janus kinase pathways. Four individuals (6.3%) were undergoing combination therapy involving both conventional DMARDs and biologic agents. Notably, two patients (3.1%) were not receiving any form of pharmacological treatment at the time of evaluation.

Participants were stratified into two categories according to disease activity levels: Remission or low disease activity [group 1 (n=47)] and moderate to high disease activity [group 2 (n=17)]. When treatment regimens were analyzed in relation to disease activity, 33 patients (71.7%) receiving DMARD monotherapy and 9 patients (75%) treated exclusively with biologic agents were classified within group 1. Statistical analysis revealed no significant association between DAS-28-defined disease activity groups and the type of pharmacological treatment administered ( $p=1.000$ ).

**Table 1.** Demographic characteristics of RA patients

Mean age (years)	56.1±11.82
Gender, n, %	
Female	49 (76.6%)
Male	15 (23.4%)
Disease duration, n, %	
<1 year	12 (18.8%)
1-5 years	19 (29.7%)
5-10 years	7 (10.9%)
>10 years	26 (40.6%)
Family history of rheumatic disease, n, %	22 (34.4%)
At least one comorbidity, n, %	34 (53.1%)
HT	20 (58.8%)
DM	12 (35.3%)
Asthma	9 (26.5%)
Coronary artery disease	5 (14.7%)
Treatment, n, %	
DMARDs only	46 (71.9%)
Biologic therapy only	12 (18.8%)
Combination therapy	4 (6.3%)
No current treatment	2 (3.1%)

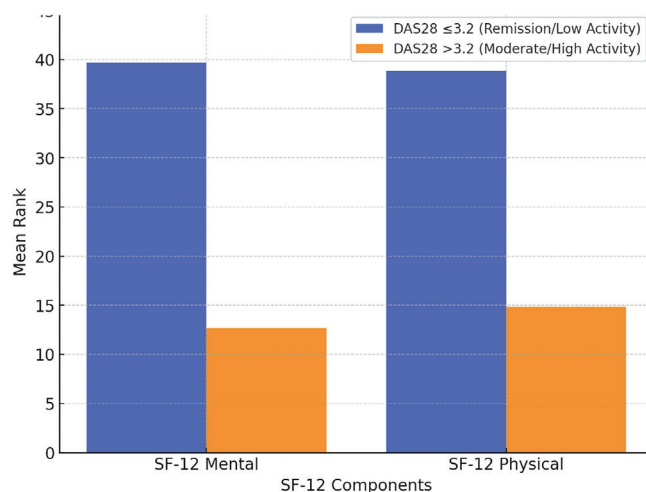
DM: Diabetes mellitus, DMARDs: Disease-modifying antirheumatic drugs, HT: Hypertension, RA: Rheumatoid arthritis

Likewise, no significant correlations were observed between treatment type and SF-12 mental component ( $p=0.68$ ) or physical component ( $p=0.08$ ) scores.

Patients were grouped into four categories according to disease duration:  $\leq 1$  year (n=12, 18.8%), 1-5 years (n=19, 29.7%), 5-10 years (n=7, 10.9%), and >10 years (n=26, 40.6%). Analysis of the relationship between disease duration and disease activity revealed no significant correlation, indicating that disease duration did not have a measurable effect on DAS-28 scores (Spearman's  $\rho=-0.008$ ,  $p=0.949$ ). Similarly, no statistically significant associations were identified between disease duration and SF-12 mental component ( $p=0.64$ ) or physical component ( $p=0.95$ ) scores.

When QoL was compared between the DAS-28 disease activity groups, both SF-12 mental and physical scores were significantly lower in patients with moderate to high disease activity (group 2) ( $p<0.001$ ) (Figure 1). Furthermore, evaluation of VAS pain scores in relation to DAS-28 categories showed that individuals in group 2 exhibited substantially higher VAS scores compared to those in group 1 (Spearman's  $\rho=0.816$ ,  $p<0.001$ ) (Figure 2).

The effect of age on patients' QoL was examined, and no significant relationship was found between age and SF-12 mental scores (Spearman's  $\rho=-0.196$ ,  $p=0.124$ ) or SF-12 physical scores (Spearman's  $\rho=0.000$ ,  $p=1.000$ ). When evaluating the impact of gender on QoL, no significant difference was observed between groups in terms of SF-12 physical scores ( $p=0.054$ ). However, SF-12 mental scores were found to be worse in males, with a statistically significant difference between male and female groups ( $p=0.027$ ).



**Figure 1.** Comparison of SF-12 mental and SF-12 physical scores by DAS-28 groups. This visualization shows that patients in the remission/low activity group (DAS-28  $\leq 3.2$ ) have significantly higher SF-12 mental and physical scores than those in the moderate/high activity group (DAS-28  $> 3.2$ ).  
DAS-28: Disease activity score-28, SF-12: Short form-12



The impact of employment status on QoL was also evaluated. Accordingly, individuals who were not employed had significantly better SF-12 physical health scores compared to those who were employed ( $p=0.030$ ). However, no significant difference was observed between the two groups in terms of SF-12 mental scores.

When evaluating patients' treatment satisfaction, 43 patients (67.2%) reported being satisfied with their current treatment, while 7 patients (10.9%) stated they were not satisfied. When treatment satisfaction was analyzed based on the type of medication, patients using conventional DMARDs were found to be more satisfied with their treatment compared to those receiving biological therapy ( $p=0.012$ ).

16 patients (25%) stated that their disease did not affect their lives at all, whereas the remaining 48 patients (75%) reported that the disease affected their daily lives to some extent. Additionally, 27 patients (42.2%) reported that their overall QoL was high. 28 patients (43.8%) stated that there had been no changes in their participation in social activities.

A total of 37 participants (57.8%) reported experiencing a satisfactory level of psychological well-being. In contrast, 13 individuals (20.3%) indicated poor psychological status, while 14 participants (21.9%) expressed ambivalence regarding their psychological state. A statistically significant and strong positive correlation was identified between psychological distress and VAS pain scores ( $p<0.001$ ), indicating that individuals who reported feeling psychologically unwell also exhibited higher levels of pain (Figure 3). In other words, as psychological well-being deteriorated, perceived pain severity increased. Moreover, a similarly strong and

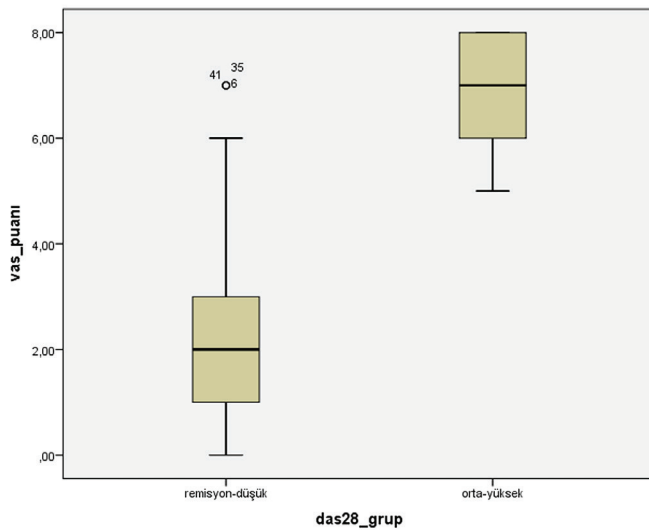
statistically significant positive association was observed between psychological well-being and overall QoL ( $p<0.001$ ). Participants with poorer psychological status tended to report markedly reduced QoL.

## Discussion

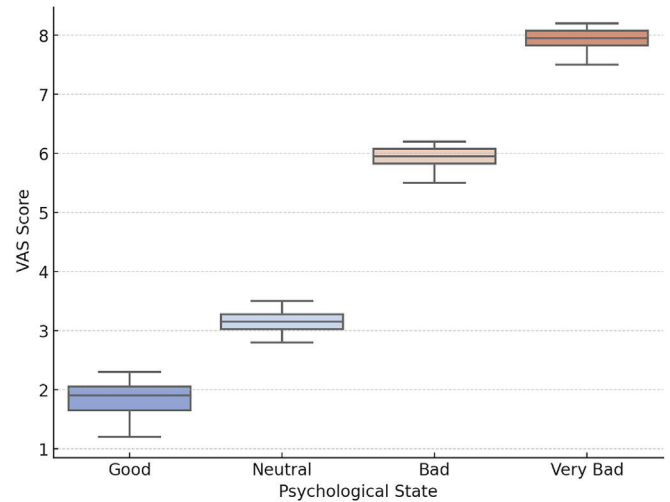
In our study, we evaluated the relationships between demographic characteristics, treatment types, disease activity, pain levels, psychological status, and QoL parameters in patients with RA. Our findings revealed that patients with moderate to high disease activity had significantly lower physical and mental health scores ( $p<0.001$ ). Similarly, VAS pain scores were notably higher in patients with higher disease activity ( $p<0.001$ ). In line with these findings, psychological status was found to be strongly associated with both pain and overall QoL ( $p<0.001$ ).

Our findings were consistent with data in the literature. The most significant factors determining QoL in RA patients were pain perception (VAS score), DAS-28 disease activity indices, and psychological status. In contrast, age, disease duration, and the type of treatment used did not have a significant impact.<sup>[9,10]</sup>

RA is frequently associated with symptoms such as pain, fatigue, reduced physical function, and emotional distress. In the absence of timely and effective treatment, the disease may progress to cause irreversible structural and functional impairments. These consequences not only diminish patients' HRQoL but also contribute to a substantial economic burden at the societal level.<sup>[11]</sup> Accordingly, the primary aim of treatment should extend beyond achieving clinical remission to include improvements in HRQoL and



**Figure 2.** Distribution of VAS scores according to DAS-28 disease activity groups. As disease activity increases, patients' pain levels (VAS) also increase. DAS-28: Disease activity score-28, VAS: Visual analog scale



**Figure 3.** VAS scores by psychological state. Accordingly, patients who felt psychologically well had low VAS scores, while patients who felt bad or very bad had high VAS scores. VAS: Visual analog scale



physical capabilities, thereby reducing the overall impact of RA on both individuals and the healthcare system.

Clinical and laboratory markers are commonly used to assess disease activity. However, the patient's own perspective on disease worsening or flares is a highly important metric.

<sup>[9]</sup> Since data such as the impact of the disease on daily life can only be obtained directly from the patient, some researchers consider patient-reported outcomes to be even more important than clinician-reported measures.

<sup>[12]</sup> The SF-12 is a 12-item questionnaire derived from the SF-36, used to calculate physical component summary and mental component summary scores.<sup>[13]</sup> SF-12 has been studied in various patient populations and has shown strong correlations with SF-36.<sup>[14,15]</sup> Therefore, it is widely used for assessing QoL in various rheumatic diseases.<sup>[16,17]</sup>

Similarly, a study by Rosa-Gonçalves et al.<sup>[9]</sup> emphasized that higher disease activity negatively affects HRQoL and functional capacity, with an interesting finding that SF-36 showed stronger correlations with measures of disability and pain (such as HAQ and VAS-P) than with traditional disease process indicators like erythrocyte sedimentation rate, C-reactive protein, and joint count.

The findings obtained from our QoL assessment using the SF-12 indicate that the factors affecting QoL in RA patients are not limited to disease activity alone; pain and psychological well-being also play significant roles. A recent systematic review investigating HRQoL determinants in RA patients identified disease duration, disease activity, and physical function as the most frequently evaluated factors.

<sup>[18]</sup> The review found that higher disease activity and poorer physical function were consistently associated with worse HRQoL, whereas the association between longer disease duration and HRQoL was inconsistent. Additionally, psychosocial factors such as anxiety and depression showed strong negative associations with HRQoL. These findings are consistent with the present study, which also demonstrated that disease activity and pain were major contributors to reduced QoL. This highlights that disease management requires more than just controlling physical symptoms. To improve patients' QoL, it is essential to incorporate multidimensional approaches such as pain management and psychological support into treatment plans. Furthermore, the significantly lower physical and mental health scores observed in patients with high disease activity underscore that these individuals may not benefit adequately from treatments targeting disease activity alone, emphasizing the need for a multidisciplinary treatment strategy. These findings suggest that a more comprehensive approach should be adopted in the management of RA.

## Study Limitations

Our study has several limitations. The main limitations of our study are the lack of a control group. Another limitation of our study is the small number of samples. The study design is cross-sectional, which prevents us from assessing changes in QoL as the disease progresses and the factors impacting these changes. Additionally, it is not possible to establish the directionality of interpretation, meaning it is unclear whether the group of patients in remission and with low disease activity showed better SF-12 scores compared to when they presented higher levels of disease activity. A further limitation is that the joint damage was not assessed.

## Conclusion

Although clinical practice often focuses on disease activity, our findings highlight that pain management and psychological support are also critical for improving QoL. The significantly lower physical and mental health scores observed in patients with moderate to high disease activity indicate that controlling disease activity alone is not sufficient. This emphasizes the need for a holistic treatment approach. Therefore, in the management of RA, comprehensive strategies should be developed that address not only inflammation but also pain perception and mental health.

## Ethics

**Ethics Committee Approval:** The study received ethical approval from the Ethics Committee of Kırıkkale University (approval number: 19, dated: 09.04.2025) and was conducted in compliance with the ethical principles outlined in the 1964 Declaration of Helsinki and its subsequent revisions.

**Informed Consent:** Retrospective study.

## Footnotes

### Authorship Contributions

Surgical and Medical Practices: Ö.K., Concept: Ö.K., A.E., Design: M.A., Data Collection and Processing: M.A., Analysis or Interpretation: Ö.K., Literature Search: M.A., A.E., Writing: Ö.K., A.E.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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