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(CAASS)  
University Business Academy in Novi Sad, Faculty of  
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# **BOOK OF PROCEEDINGS**

Editor: Dr Branko Savić, professor

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International Multidisciplinary Conference  
"Challenges of Contemporary Higher Education" - CCHE 2024  
Kopaonik January 29th - February 3rd 2024  
Vol\_2



**Challenges of  
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## THE QUALITY OF LIFE AND DISEASE ACTIVITY IN PEOPLE WITH RHEUMATOID ARTHRITIS

Šimpraga Ljiljana<sup>1</sup>, Potić Srećko<sup>2</sup>, Sretenović Ivana<sup>3</sup> & Ilić Milan<sup>1</sup>

**Abstract:** The goal of the research was to determine the impact of disease activity on the quality of life in people with rheumatoid arthritis. The sample consisted of 60 subjects of both sexes with rheumatoid arthritis. To assess the quality of life, the Rheumatoid Arthritis Quality of Life (RAQoL) questionnaire was used, while disease activity was assessed using the Clinical Disease Activity Index (CDAI). The research results show that there is a connection between the activity of diseases and the quality of life in people with rheumatoid arthritis. The application of modern treatment protocols is important in the rehabilitation approach in order to reduce disease activity and the extent of expected damage due to arthritis, which directly affects the maintenance of the quality of life of the affected people.

**Key words:** rheumatoid arthritis, quality of life, disease activity, biological therapies

### INTRODUCTION

According to the simplified classification of rheumatic diseases [1], rheumatoid arthritis belongs to inflammatory rheumatic diseases, a group of idiopathic arthritis (in addition to metabolic arthropathies and infectious arthritis). In the division of idiopathic arthritis into primary joint diseases and systemic connective tissue diseases, rheumatoid arthritis belongs to primary joint diseases, along with rheumatic fever, juvenile idiopathic arthritis, and spondyloarthropathies.

Rheumatoid arthritis (hereafter RA) is a chronic inflammatory disease characterized by progressive damage to joints and synovial sheaths with variable extra-articular manifestations [2]. RA is an autoimmune systemic disease, the basis of which is the occurrence of inflammatory polyarthritis. The symmetrical proliferation of the synovium of the joints, accompanied by tenderness of the joints, especially the small joints of the hands and feet, as well as the emergence of morning stiffness that lasts for more than an hour, is characteristic of this. The presence of RF (rheumatoid factor, RF) or RF and ACPAs (anti-citrullinated protein antibodies) together (immunoglobulin that binds the Fc region of the IgG molecule, anti-citrullinated peptide antibodies) in the blood indicates RA (occurs in 80% of patients). The presence of rheumatoid nodules, or nodules in characteristic regions of the extremities (found in 20% of patients), is also indicative of RA. The aforementioned signs of symmetrical swelling and tenderness of the small joints of the hand and fingers lasting several weeks, morning stiffness, and positive RF or ACPA are diagnostic indicators of RA [3].

When decisions are made about RA treatment strategies, the disease activity, degree of joint damage, and functional capacity are considered, where all three determinants are part of the most important outcome - quality of life. Health is only one factor relating to quality of life. There are other factors that have an impact on an individual's quality of life that are not tied to the medical field, such as education, culture, religion, and financial status [4]. Thus, quality of life related to health includes only those factors that are part of an individual's health and therefore represents a subjective assessment of the state of one's health, as well as one's ability to lead a fulfilling life [5]. On a broader level, in addition to the examination of biological and clinical characteristics, measuring the quality of life determines the general success of the interventions and therapies undertaken in relation to the health and well-being of the person being rehabilitated [6].

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In addition to numerous examples in literature and different aspects of observation, the World Health Organization [7] defines quality of life as a state of complete physical, mental, and social well-being.

Disease activity, in addition to functional damage, reveals the underlying process and severity of the disease, and is among the basic elements of the pathobiology of RA. Defined cut-off points of assessment instruments, in this case the CDAI (Clinical Disease Activity Index), enable the quantification of disease activity and guide the selection of treatment approaches. According to current therapeutic approaches, the effects of "treat to target", or adjusting the therapy as needed, leads to an improvement in the disease activity index of at least 50% within three months in order to reach a low level of disease activity or remission during six months. Therefore, the effects of therapy can be monitored by measures of disease activity (CDAI), where the absence of remission or low disease activity leads to changes in therapy, in accordance with treatment recommendations towards a set goal [8]. A time period of three months constitutes a critical period for achieving the therapeutic goal - clinical remission in early RA or low disease activity in chronic, established arthritis [9].

## 1. METHODOLOGY

The aim of this research was to determine the relationship between quality of life and disease activity in people with rheumatoid arthritis. The research sample consists of 60 respondents with rheumatoid arthritis, with 16 (27%) being male and 44 (73%) being female, all aged over 18 years. The respondents in our research are patients with rheumatoid arthritis undergoing rehabilitation at the Institute of Rheumatology in Belgrade. The sample includes people with different durations of the disease, activity of the disease, and method of treatment, as detailed in the database and medical documentation of the institution. The distribution of respondents according to gender is given in Table 1.

*Table 1 – Structure of the sample in relation to the sex of the respondents*

Gender	N	%
Men	16	26.7
Women	44	73.3
Total	60	100.0

Table 1 demonstrates that the sample consisted of 44 female respondents and 16 male respondents. The age of the respondents ranged from 20 to 77 years, and the average was 53.17 years (SD = 14.14). The average age of male respondents was 55.81 years (SD = 14.63), and the average age of female respondents was 51.48 years (SD = 13.74). However, the statistical significance of the difference in the age of the subjects in relation to gender was not confirmed using the Mann-Whitney U-test (male, Mdn = 62.50, IQR = 20.25; female, Mdn = 52.50, IQR = 17.75; U = 242.500, z = -1.832, p = 0.067, r = 0.24).

*Table 2 – Structure of the sample in relation to the duration of the disease*

Duration of illness	N	%
Early RA	8	13.3
Late RA	51	85.0
Missing data	1	1.7
Total	60	100.0

The structure of the sample in relation to the duration of the disease is given in Table 2. The largest number of respondents, 51 of them (85%), had late RA.

*Table 3 – Sample structure in relation to current disease activity*

Disease activity	N	%
Low activity	10	16.7
Moderate activity	10	16.7
High activity	2	3,3
Remission	38	63,3

Table 3 demonstrates that more than half of the subjects have RA that is in remission, while 16.7% of respondents have low or moderate RA activity. When it comes to the method of treatment, according to an examination of the health documentation at the time of conducting the research, 31 (52%) respondents used standard therapy, while 29 (48%) respondents were on standard and biological therapy. A questionnaire designed for research purposes was used to collect sociodemographic data and data related to rheumatoid arthritis.

We collected data on the duration of the disease (early, late RA), disease activity (in remission, in exacerbation) and the method of treatment (standard, biological therapy) by accessing the database and reviewing the medical documentation of the health institution where the respondent is undergoing treatment or rehabilitation.

The Rheumatoid Arthritis Quality of Life questionnaire, RAQoL, was used to assess the quality of life. This instrument is intended to assess the quality of life specifically in people with RA. The instrument assesses the quality of life from the point of view of patients with rheumatoid arthritis about specific activities in their daily lives through social integration and an emotional component. To determine the reliability of the instrument, Cronbach's reliability coefficient  $\alpha$  was used, which for the applied instrument has satisfactory internal agreement (Cronbach's alpha coefficient had a value of 0.882).

The disease activity of the subjects in this research was assessed using the Clinical Disease Activity Index, CDAI. The Clinical Disease Activity Index is a composite index obtained by the simple numerical addition of four clinical variables: the total number of painful and swollen joints during the examination, and the patient's and the doctor's assessment of disease activity on the pain scale (VAS). Considering that it does not require laboratory values, it is considered an available and applicable instrument in clinical measurements related to RA.

Table 4 shows descriptive indicators of respondents' achievements on the RAQoL questionnaire. According to the results, the average RAQoL score is 4.23 (SD = 4.66), ranging from 0.00 to 19.00 out of a possible maximum of 30.

*Table 4 – Descriptive measures of respondents' achievements on the Rheumatoid Arthritis Quality of Life (RAQoL) questionnaire*

Rheumatoid Arthritis Quality of Life (RAQoL) score	M	SD	SE	Mdn	IQR	Min	Max
	4.23	4.66	0.60	3.00	5.00	0.00	19.00

*Note: A higher score indicates a lower quality of life*



The distribution of respondents according to the CDAI value is given in Table 5. According to the results, the largest number of respondents, 36 (60%), belong to the category of remission, while 19 (32%) of the respondents are classified into the category of low activity.

Table 5 – Distribution of subjects according to CDAI value

CDAI – Clinical Disease Activity Index	N	%
Low activity	19	31.7
Moderate activity	4	6.7
High activity	1	1.7
Remission	36	60.0

A comparison of the overall achievement of the respondents on the RAQoL questionnaire in relation to disease activity is given in Table 6. Using the Kruskal-Wallis test, a statistically significant difference was determined at the  $p < 0.01$  level. Post hoc comparisons using the Mann-Whitney U-test showed that statistical significance with a Bonferroni correction of 0.017 was reached by the difference between the median RAQoL scores of subjects with moderate disease activity and subjects with remission (7.00 vs. 2.00;  $p = 0.002$ ). On the other hand, the difference between the median values of the RAQoL score of subjects with low disease activity and subjects with remission did not reach a statistical significance (3.00 vs. 2.00;  $p = 0.181$ ), nor did the difference between subjects with low disease activity and subjects with moderate disease activity. (3.00 vs. 7.00;  $p = 0.322$ ).

Table 6 – Comparison of subjects' achievements on the Rheumatoid Arthritis Quality of Life (RAQoL) questionnaire in relation to disease activity

RAQoL		M	SD	Mdn	IQR	Comparison
Total	Low	6.40	7.28	3.00	14.50	$\chi^2 = 9.581, df = 2, p = 0.008$
	Moderate	6.10	2.77	7.00	4.50	
	Remission	2.66	2.94	2.00	4.00	

## DISCUSSION

The aim of this research was to determine the relationship between the quality of life and disease activity in people with rheumatoid arthritis. According to the results of the conducted research, we found that in the comparison between the total achievement of the respondents on the questionnaire related to the quality of life in rheumatoid arthritis and disease activity, there is a statistically significant difference in the scores of respondents with moderate disease activity and those in remission (7.00 vs. 2.00;  $p = 0.002$ ).

Furthermore, we observed that the results of the conducted research and the collected data on the current general state of health from the respondents' point of view obtained using the questionnaire are in accordance with the clinical results on disease activity taken from the database of the institution where we conducted the research. The rate of disease activity was assessed using the Clinical Disease Activity Index, CDAI, where the largest number of respondents, 60% of them, belonged to the category of remission, while 32% of respondents were classified into the category of low disease activity. These results are comparable to the results of The Disease Activity Score, a DAS28 assessment instrument, which also assesses disease activity and was available in the database for several subjects.

The assessment instrument that was the source of data on disease activity in this research is a standard approach and one of the most used measures in monitoring disease development in RA [10], [11], [12]. Bearing this in mind, we found that the results of certain studies [13] indicate that the remission rate and lower disease activity depend on the instruments used (28 joint Disease Activity Score - DAS28, Clinical Disease Activity Index - CDAI, Simple Disease Activity Index - SDAI, Routine Assessment of Patient Index Data - RAPID3). In the study from 2012 [14] instruments were used that were also represented in our research, including CDAI and DAS28 as which are most often applied in clinical trials according to the recommendations of ACR and EULAR 2011 for use in clinical practice (DAS28, CDAI, RAPID3). The conclusion of the study [15] was that the rate of remission of the disease, in relation to both the male and female gender, depends on the choice of measures to assess the activity of the disease.

In accordance with modern therapeutic approaches when it comes to treatment, at the time of conducting our research, 52% of respondents were only on standard therapy, while 48% of respondents were on standard and biological therapy. Considering RA as a chronic, inflammatory disease that, through progression and destructive course, affects the functionality and thus the quality of life of a person with RA, the evidence related to the therapeutic approach from the last decades must be taken into consideration.

These findings are in favor of mitigating the severity of the aforementioned consequences, the disease has become "less severe" which can be prescribed, among other things, with new treatment approaches [16]. When it comes to this, researchers agree that there is adequate evidence in favor of reducing disease activity and preserving functional abilities and health-related quality of life with the use of biological therapy, especially in modern countries [17].

Pain is a characteristic symptom of RA that occurs, among other things, due to structural damage resulting from disease activity. Pain presents a significant barrier to participation in work activities and social contexts. The symptom of pain in RA is one of the most significant factors that disrupt daily activities and participation, as well as the overall quality of life of a person with RA. We can relate the above to our respondents under the assumption that the presence of pain is related to functional impairments as limiting factors in relation to the overall quality of life.

In research that studied disease activity in RA, it was shown that the severity of pain is the most significant variable that indicates disease activity, as well as that there is a significant correlation between disease activity and quality of life, pain, fatigue and functional status, and depression [18]. Pain reduction is the main subjective symptom and "concern" of people with RA, thus modern clinical research is focused on finding solutions to reduce disease activity, which is key to reducing RA pain intensity [19].

There are works cited that indicate that disease activity and pain contribute to physical difficulties that further threaten the quality of life of people with RA. Therefore, we analyzed the results of a cross-sectional study by [20]. The study included a group of people with RA (115 subjects, mean age  $53.67 \pm 8.19$ ) and a control group consisting of their relatives (95 volunteer subjects without the presence of musculoskeletal inflammatory diseases, mean age  $52.52 \pm 8.47$ ) without statistically significant differences in demographic characteristics ( $p > 0.05$ ).

Quality of life and the impact of disease and pain activity were measured by RAQoL, DAS28 and VAS scale - at rest and while moving. In the group with RA, there were 13 patients with mild disease activity, 61 with moderate and 26 with high disease activity. The study determined positive correlations of RAQoL score with VAS and DAS28 scores ( $r = 0.075$ ,  $p = 0.000$ ;  $r = 0.80$ ,  $p = 0.000$ , respectively) ( $p < 0.001$ ), which confirms the influence of disease activity through pain on a person's quality of life with RA.

In the context of the obtained results, disease activity is a significant predictor of damage and lower quality of life, it is undeniable that RA can threaten all aspects of quality of life and dysfunction in the wider environment. These statements are confirmed by research, [21] where disease activity (DAS28) and quality of life (RAQoL) are significantly positively correlated ( $r = 0.70$ ,  $p = 0.00$ ).



Subjects who were in remission or in the phase of low disease activity had a low RAQoL score and thus a good quality of life. On the other hand, respondents with a high rate of disease activity also had a high RAQoL score, which indicated a poor quality of life

Additionally, according to the report of Turkish authors [22], the activity of the disease has a negative impact on the functionality and consequently on the quality of life in RA. Data was collected using standard instruments DAS28, HAQ and RAQoL. Comparing the capabilities of certain generic instruments and instruments used to assess the quality of life specifically in RA (RAQoL, HAQ), in a slightly older study [23], found similar data regarding the connection between disease activity, functional impairment, and quality of life in RA.

## CONCLUSION

Based on the set research objective and the presented research results, we can draw the conclusion that disease activity has an impact on quality of life. In contrast to the direct negative impact of functional impairments, the activity of the disease through the impaired functional abilities and the duration of the disease indirectly affects the quality of life of a person with RA. Advances in medicine and research in the field of modern biological therapy are changing the structure of the lives of those suffering from inflammatory rheumatic diseases. Moreover, the interests of researchers from various scientific fields are directed towards determining factors of the quality of life of people with RA in order to attain the necessary conditions that enable their maximum participation in all areas of life.

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