

# Quality of life, duration of the disease and the level of pain in patients with rheumatoid arthritis

## Authors' Contribution:

- A Study Design
- B Data Collection
- C Statistical Analysis
- D Data Interpretation
- E Manuscript Preparation
- F Literature Search
- G Funds Collection

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## abstract

- Background** The aim of the present study is to evaluate life quality of people suffering from RA and determine the influence of illness duration and degree of pain intensity on their quality of life.
- Material/Methods** The group of subjects comprised of 189 people: 104 (55.03%) with diagnosed RA and 85 (44.97%) healthy people as control group. Mean age in the group of ill subjects was 57.66 ±11.30 and 68 ±8.99 in the control group. In the research, self-constructed questionnaire, Visual Analogue Scale (VAS) and shortened version of WHOQoL-Bref were used. Assumed significance level was  $p < 0.05$ .
- Results** Patients with RA received statistically significantly lower scores of life quality in all domains as compared with the control group. In the group of ill subjects, social domain (14.91 ±2.40) obtained highest scores whereas physical domain received lowest scores (11.96 ±1.69). The main somatic issue connected with the illness reported by 95.19% of subjects was experienced joint pain. Mean degree of perceived pain in VAS scale reached 7.37 ±1.86 points and it significantly lowered life quality of ill subjects.
- Conclusions** The results regarding life quality in four life domains (i.e. physical, psychological, social and environmental) were definitely better than in the control group.
- Key words** quality of life, rheumatoid arthritis, pain

## article details

- Article statistics** **Word count:** 3,324; **Tables:** 4; **Figures:** 0; **References:** 33  
**Received:** July 2016; **Accepted:** February 2016; **Published:** March 2017  
<http://www.balticsportscience.com>
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- Indexation:** AGRO, Celdes, CNKI Scholar (China National Knowledge Infrastructure), CNPIEC, De Gruyter - IBR (International Bibliography of Reviews of Scholarly Literature in the Humanities and Social Sciences), De Gruyter - IBZ (International Bibliography of Periodical Literature in the Humanities and Social Sciences), DOAJ, EBSCO - Central & Eastern European Academic Source, EBSCO - SPORTDiscus, EBSCO Discovery Service, Google Scholar, Index Copernicus, J-Gate, Naviga (Softweco, Primo Central (ExLibris), ProQuest - Family Health, ProQuest - Health & Medical Complete, ProQuest - Illustrata: Health Sciences, ProQuest - Nursing & Allied Health Source, Summon (Serials Solutions/ProQuest, TDOne (TDNet), Ulrich's Periodicals Directory/ulrichsweb, WorldCat (OCLC)
- Funding:** This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.
- Conflict of interest:** Authors have declared that no competing interest exists.
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## INTRODUCTION

The term the quality of life conditioned by the state of health was introduced on the medical ground by Shipper, which is defined as perceived by the patient influence of the disease and its course of treatment on the functioning and the general feeling of satisfaction with life [1, 2]. The main dimensions of the quality of life conditioned by the state of health dimensions include the physical state and mobility, the mental state in terms of cognitive and emotional functioning, social functioning and somatic sensations [1, 2].

Rheumatoid arthritis (RA) is a chronic autoimmune disease of the connective tissue, characterized by nonspecific inflammation of symmetrical arthritis and occurrence of extra-articular changes and systemic complications, leading to disability and premature death [3]. The peak incidence of falls is in the period of greatest professional activity during 4th and 5th decade of life [3, 4]. According to data from the United States, about 50% of patients lose the ability to work after 10 years of the disease, and 50-90% stop working before the age of 65 [3, 5]. According to Wisłowska et al., one of the basic phenomena of RA is the reduced quality of life of patients and their families [6]. According to van Riel, model factors determining the quality of life of patients with RA are clinical factors relating to the disease process, variables reflecting the results of the disease, as well as socio-demographic factors [7]. Numerous articular changes and constantly felt pain and progressive disability make patients with RA lose their sense of independence and experience psychological stress. Pain significantly reduces the activity of a patient with rheumatoid arthritis, discourages efforts and makes the process of rehabilitation more difficult. Currently, it is believed that pain is one of the most important determinants of health and the quality of life of patients with RA [8].

The deterioration in the subjective assessment of the quality of life is associated with a reduction in family, social and professional activity. The quality of life in the functional dimension changes. The functional state alongside the state of emotional and social support is an important predictor of the quality of life. Studies have shown that deformations of the hand and the limitation of locomotion leads to gradual isolation of patients. The feeling of exclusion and isolation is reinforced by job loss or inability to continue working [9, 10]. The results of previous studies confirm that numerous ailments of the musculoskeletal system and a reduction in physical functioning, including disability, are the main causes of professional activity inhibition and the loss of livelihoods among patients with RA [11]. Everyday activities performed by a patient with RA require the involvement of multiple joints of upper and lower limbs. This is very difficult, if only because of the so-called morning stiffness - typical of RA [12]. Limited hand grip and range of motion of the shoulder girdle cause difficulties in brushing teeth and hair, taking care of one's nails, shaving or bathing [12, 13]. The hand grip strength depends on the severity of the disease process. Nordenskiöld and Grimby note that there is a strong correlation between the values of muscle strength in hands and the severity of joint pain, and the degree of ability to perform daily activities [12, 14]. The correct treatment of patients with RA consists of pharmacological treatment, rehabilitation, physical therapy, psychotherapy, and lifestyle changes. Also, the process of adaptation of patients with RA disease, which allows them to regain self-esteem, a sense of control and personal impact on lives, while coping with the disease significantly affects the adaptive functions [15, 16,

17]. Improving the quality of life by changing the patient's well-being and obtaining satisfactory for him functioning in social roles seem to be a strategic goal of treatment [18].

The aim of the present study is to evaluate the life quality among people suffering from RA and to determine the influence of the illness duration and the degree of pain intensity on their quality of life.

## MATERIAL AND METHODS

The group of subjects comprised 189 people: 104 (55.03%) were diagnosed with RA on the basis of diagnostic criteria ACR and EULAR 2010 (subgroup 1) and 85 (44.97%) were healthy subjects (subgroup 2). The study was conducted at the turn of 2014 and 2015 among patients of rheumatology units and outpatients clinics located in healthcare establishments in Olsztyn. All the subjects were notified of the research aim and expressed their informed consent to participate in the study. In the research the method of a diagnostic survey was used while a self-constructed survey questionnaire including basic sociodemographic and medical questions helped to collect the data.

Moreover, to evaluate life quality, a shortened version of WHOQoL-Bref questionnaire in the Polish adaptation of Wołowicka and Jaracz was used. It comprises 26 questions and facilitates creation of the life quality profile in four domains: physical, psychological, social and environmental functioning. The physical domain includes activities of daily living, dependence on treatment and medication, a surge of energy and fatigue, mobility, experienced pain and discomfort, rest and sleep and ability to work. The psychological domain defines mental functioning and is used to assess the negative/positive emotions and feelings, self-esteem, appearance, spirituality, personal faith, thinking, learning, memory and concentration. The social domain is used to assess social relations, personal relationships, social support and sexual activity, whereas the environmental domain includes resources/components which affect functioning in the environment. Two questions evaluating the perception of life and health quality were analysed as a separate category. The subjects replied to these questions using a 5-degree scale (with point range 1-5). In each domain the subject could score max 20 points.

The results of particular domains had a positive direction (the higher the number of points, the higher the quality of life). Reliability of the Polish version of WHOQoL-Bref questionnaire was close to the original version. The obtained Cronbach's alpha coefficient was very high and it referred to the evaluation of particular domains (results ranging from 0.69 to 0.81) as well as the whole questionnaire (0.90) [19]. In order to determine the degree of experienced pain, the Visual Analogue Scale (VAS) was used. On a horizontal 10-cm-long line the patients marked the point that they felt represented their perception of their current pain degree, between values denoting «no pain» and «pain as bad as it could possibly be» [20]. To evaluate the diversification of values of the researched characteristics in class variables grouping the patients, the U-Mann-Whitney test was used. Moreover, in order to diversify mean values of life quality in groups of disease duration, the ANOVA (F) test was used. The correlation of analysed characteristics (the degree of pain intensity and the health life quality of patients with RA) was verified with the use of Pearson's

correlation coefficient. The level of significance was assumed at  $p < 0.05$ . Statistical calculations were performed with the use of STATISTICA 10 PL.

## RESULTS

The mean age in the subgroup of ill people was  $57.66 \pm 11.30$ , and in the control group  $54.68 \pm 8.99$  years. The majority of subjects lived in a city ( $n = 149, 78.84\%$ ), were married ( $n = 129, 68.25\%$ ), with secondary ( $n = 88; 46.56\%$ ) and higher ( $n = 63, 33.33\%$ ) level of education. The majority of the subjects were women  $71.43\%$  ( $n = 135$ ). The most numerous group ( $n = 31; 29.80\%$ ) were subjects who had been coping with the illness from 6 up to 10 years, and  $67.31\%$  ( $n = 70$ ) claimed that apart from RA they were treated for concurrent diseases, including hypertension ( $n = 38$ ), diabetes ( $n = 28$ ), osteoporosis ( $n = 22$ ) and depression ( $n = 8$ ).

Subjects with RA were also asked about activities of daily living which cause most difficulty. They indicated that the most problematic activities include: using the stairs -  $84.62\%$  ( $n = 88$ ) and lifting objects from the floor -  $64.42\%$  ( $n = 67$ ). They also enumerated actions connected with opening and twisting objects -  $49.04\%$  ( $n = 51$ ), sitting down and getting up from the toilet -  $34.62\%$  ( $n = 36$ ) and getting dressed (doing up the buttons or shoelaces) -  $25\%$  ( $n = 26$ ). Slightly less problematic are daily hygiene (washing and drying the body, taking a bath in the bathtub -  $18.27\%$ ;  $n = 19$ ) and eating (cutting bread, lifting a glass of juice etc. -  $13.46\%$ ;  $n = 14$ ). Almost  $1/3$  of the subjects ( $32.69\%$ ;  $n = 34$ ) claimed that they have difficulty with performing four or more of the aforementioned activities of daily living.

The analysis shows that in subgroup 1 - people with illness - the sense of the quality of life in the physical domain was statistically significantly ( $U = 3343$ ;  $p < 0.003$ ) lower than in subgroup 2 - healthy people. Next the psychological domain was analysed. The level of the quality of life in the psychological domain was significantly lower ( $U = 2389$ ;  $p < 0.0000$ ) in subgroup 1 than in subgroup 2. The results for the subjective quality of life in the social domain in subgroup 1 proved to be statistically significantly ( $U = 2992$ ;  $p < 0.0001$ ) lower in subgroup 1 than in 2. In the fourth domain, including resources/components affecting functioning in the environment, the quality of life was significantly ( $U = 3607$ ;  $p < 0.03$ ) lower in subgroup 1 than in subgroup 2 (Table 1).

Table 1. Characteristics of life quality domains according to WHOQoL-Bref questionnaire

Descriptive statistics	Domains							
	D1 - physical		D2 - psychological		D3 - social		D4 - environmental	
	subgroup 1	subgroup 2	subgroup 1	subgroup 2	subgroup 1	subgroup 2	subgroup 1	subgroup 2
N	104	85	104	85	104	85	104	85
Me	12.00	12.57	12.67	14.67	14.67	16.00	13.00	14.00
Min.	8.00	9.14	7.33	8.67	6.67	6.67	6.00	6.50
Max	16.57	15.43	18.67	18.00	20.00	20.00	19.50	20.00
Max-Min	8.57	6.29	11.33	9.33	13.33	13.33	13.50	13.50
Mann-Whitney - U test	U = 3343, p < 0.003***		U = 2389, p < 0.00001***		U = 2992, p < 0.0001***		U = 3607, p < 0.03*	

Statistically significant:  $p < 0.05^*$ ,  $p < 0.01^{**}$ ,  $p < 0.001^{***}$

Description: N - sample size, Me - median, Min - minimum, Max - maximum

Afterwards, two questions evaluating the level of satisfaction with life quality and the health status in the subgroups of subjects were analysed. The analysis shows that in subgroup 1 the level of overall satisfaction with the quality of life was significantly ( $U = 3179$ ,  $p < 0.0003$ ) lower than in subgroup 2, similarly to the perception of health among the respondents. It was found that the respondents' perception of health was statistically significantly ( $U = 1883$ ;  $p < 0.00001$ ) lower in subgroup 1 than in 2. RA is a chronic long-term disease which may have remission periods or deteriorate. It causes joint deformities and degeneration or contractures and, consequently, impairs their functioning and lowers their quality of life. According to the data presented in Tables 2 and 3, patients who have been coping with RA for a few months up to a year were characterized by a higher level of life quality than those who have been ill for a longer period of time. They obtained statistically significantly higher results in the following domains: psychological ( $F = 2.87$ ;  $p < 0.03$ ), social ( $F = 2.89$ ;  $p < 0.03$ ) and environmental ( $F = 4.25$ ;  $p < 0.003$ ) as well as in the categories of satisfaction with life quality ( $F = 8.78$ ;  $p < 0.00001$ ) and satisfaction with the health status ( $F = 18.75$ ;  $p < 0.00001$ ).

Table 2. Significance of differences between mean values in the domains of life quality with respect to the disease duration

Variable - duration of disease	N = 104	Domains							
		D1 - physical		D2 - psychological		D3 - social		D4 - environmental	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
		F = 1.47, p < 0.22		F = 2.87, p < 0.03*		F = 2.89, p < 0.03*		F = 4.25, p < 0.003***	
a few months - up to a year	24	12.33	1.81	14.14	2.58	16.28	2.04	14.79	2.04
1-5 years	25	11.86	1.76	12.48	2.12	14.24	3.39	12.68	2.70
6-10 years	31	11.71	1.58	12.56	1.96	14.80	2.24	12.74	2.15
11-20 years	15	12.04	1.46	12.04	1.70	13.96	1.81	12.53	1.65
21 years and longer	9	12.06	1.67	12.44	3.07	15.11	2.11	12.33	2.70

Statistically significant:  $p < 0.05^*$ ,  $p < 0.01^{**}$ ,  $p < 0.001^{***}$   
 Description:  $\bar{X}$  - average, SD - standard deviation

Table 3. Significance of differences between mean values for the satisfaction with life quality and the health status with respect to the disease duration

Variable - duration of disease	N = 104	Q1 - satisfaction with life		Q2 - satisfaction with one's health status	
		$\bar{X}$	SD	$\bar{X}$	SD
		F = 8.78; p < 0.00001***		F = 18.75; p < 0.00001***	
a few months - up to a year	24	3.79	0.66	3.29	0.75
1-5 years	25	3.04	0.68	2.56	0.65
6-10	31	2.97	0.66	2.52	0.68
11-20	15	2.87	0.74	2.47	0.64
21 years and longer	9	2.67	0.87	2.44	0.88

Statistically significant:  $p < 0.05^*$ ,  $p < 0.01^{**}$ ,  $p < 0.001^{***}$   
 Description:  $\bar{X}$  - average, SD - standard deviation

The main somatic issue connected with RA reported by 95.19% (n = 95) of the subjects was experienced joint pain. The degree of pain perceived by the ill subjects ranged from 2 to 10 on the VAS scale, with the mean at 7.37 ±1.86 and the median at 8.00. Assessment of the relationship between the degree of pain and the level of the quality of life in patients with RA was performed using Pearson's correlation analysis. As a result, it was concluded that there is a statistically significant correlation between the degree of perceived pain and life quality in the following domains: physical (negative, weak at the level of  $r = -0.16$ ,  $p < 0.0001$ ), psychological (negative, average at the level of  $r = -0.46$ ,  $p < 0.0001$ ), social (negative, average at the level of  $r = -0.32$ ,  $p < 0.001$ ), environmental (negative, weak at the level of  $r = -0.24$ ,  $p < 0.001$ ). This also concerns the perception of the overall quality of life (negative, average at the level of  $r = -0.37$ ,  $p < 0.0001$ ) and the health status (negative, high at the level of  $r = -0.57$ ,  $p < 0.0001$ ) (Table 4). Therefore, the dominant symptom, i.e. pain, which is experienced by RA patients till the end of their lives, lowers life quality in all domains of functioning.

Table 4. Correlations between the components of the WHOQoL-Bref questionnaire and the VAS scale

Components of WHOQoL-Bref questionnaire	VAS scale	
	Correlation of r-Pearson's	Significance level $p < 0.001^{***}$
Q1 - satisfaction with life quality	-0.37	0.0001***
Q2 - satisfaction with one's health status	-0.57	0.0001***
Domains		
D1 - physical	-0.16	0.0001***
D2 - psychological	-0.46	0.0001***
D3 - social	-0.32	0.0001***
D4 - environmental	-0.24	0.001***

Statistically significant:  $p < 0.05^*$ ,  $p < 0.01^{**}$ ,  $p < 0.001^{***}$

## DISCUSSION

In our study, patients with RA received significantly lower scores of the quality of life in physical, psychological, social and environmental domains as compared to healthy subjects in the control group. The results are very similar to those presented by many other authors and demonstrated that the quality of life of patients with rheumatoid arthritis was significantly lower than among the general population [21, 22, 23]. The overall assessment of the quality of life in the studied group of patients with RA is in the middle ranges. Patients with the lowest evaluated quality of life in the physical domain, which is associated with the degree of functional capacity, depending on the treatment and medication, experienced pain, and the ability to work (M = 11.96; SD = 1.69). Very similar results were obtained in studies conducted in a group of 64 patients with RA using a WHOQOL-Bref questionnaire by Sierakowska et al., Department of Rheumatology and Internal Medicine, Medical University of Bialystok. It was found that patients evaluated the physical and environmental domain the lowest in the area of freedom, mental security, availability and the quality of health care. 2/3 of the respondents were dissatisfied with their health [24]. Research conducted by Bączyk, as well as our study, shows that the general assessment of the quality of life of patients with rheumatoid arthritis is in the middle ranges [25]. Analysis of the collected research material in our

study showed that the major somatic complaint associated with RA, first of all reported by 95.19% (n = 95) patients, was joint pain. The degree of pain indicated by the patient on the VAS scale ranged from 2 to 10 points, with the average degree of 7.37 ±1.86. In a study conducted by Raczkiwicz et al. in a group of 119 RA patients (107 women and 12 men aged 59.7 ±11.7 years) treated in the Department of Internal Medicine and Rheumatology CSK MON WIM Warsaw it was found that rheumatoid arthritis has a significant impact on the quality of life due to pain and physical disability. Patients with newly diagnosed RA more often suffered from pain and depressed mood than patients chronically treated [26]. RA, as a chronic disease characterized by long duration, has periods of remission and exacerbation. Disability at the beginning of the disease is determined by the activity of the disease; as a further consequence, there are destructive changes in joints which affect the functioning of the patient in daily life [16]. The authors of this paper found that patients who have struggled with the disease for a few months to a year were characterized by a higher level of the quality of life than patients who have suffered from the disease longer. A study conducted by Sherrer et al. demonstrated that patients' functioning in everyday life stabilizes after the first few years of the disease. Physical disability is progressing rapidly in the early stages of the disease, and in later years the process of progression is very slow [27]. Similar observations have been made by other researchers. Meenan et al. have found that in patients whose disease has lasted for more than five years, performance in individual quality of life areas was stable [28]. In a study conducted by Wysocka-Skurska et al., in a group of 100 patients with RA, it was observed that with the longer duration of the disease, the general health assessment and evaluation of the disease activity by respondents was worse. In addition, the feeling of morning stiffness and joint pain intensified [29]. Sierakowska et al. report that the long duration of RA gradually reduces the quality of life, especially in the physical field [24]. In a study conducted by Kowalczyk and Gluszko in a group of 94 patients with rheumatoid arthritis it was found that the duration of the disease to some extent influenced only the mobility assessment, and the disease activity significantly correlated with the lower assessment of the quality of life in the dimension of mobility [30]. On the other hand, Haroon et al. found that the degree of functional disability is the factor influencing the independent assessment of the quality of life of patients with RA [31]. In conclusion, we can say that the quality of life, as an important aspect of the treatment of patients with RA, is a source of knowledge about the problems and difficulties they overcome. Many authors indicate that monitoring the quality of life in a chronic disease can be useful in the modification of treatment and in the risk stratification of death or additional hospitalization [32, 33].

## CONCLUSIONS

1. The lower assessment of the quality of life in the physical, psychological, social and environmental functioning has been demonstrated in patients with RA comparing to the control group.
2. There is a negative correlation between the degree of pain and the assessment of the quality of life. Experienced joint pain is the main clinical variable that determines the level of the quality of life in all domains of functioning.

3. A lower quality of life occurs in patients with a longer lasting disease, which is associated with progressive disability.

4. Effective measures lowering the level of pain experienced by patients will have a positive impact on the perception of the quality of life and health in all domains of functioning.

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**Cite this article as:**

**Kupcewicz E, Drejer A.** Quality of life, duration of the disease and the level of pain in patients with rheumatoid arthritis. *Balt J Health Phys Act.* 2017;9(1):72-80.