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QUALITY OF LIFE FROM THE PERSPECTIVE OF PHYSICAL FUNCTIONING IN PATIENTS WITH RHEUMATOID ARTHRITIS - PRELIMINARY REPORT

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Keywords: Rheumatoid arthritis, quality of life, HAQ, VAS

Abstract

Introduction: Rheumatoid arthritis is a chronic, inflammatory, progressive disease of connective tissue with an immunological basis. The quality of life of patients with RA is reduced due to progressive disability limiting the performance of basic everyday activities.

Materials and methods: The research was carried out by means of a diagnostic survey, using a survey technique. The research tools included the HAQ questionnaire, the VAS scale and the survey questionnaire of own design. The research was conducted among 50 RA patients meeting the ACR and ELUAR classification criteria and with a positive RF result.

Results: Patients suffering from rheumatoid arthritis encounter many limitations in everyday functioning. The higher level of HAQ was found in persons over 65, with primary and vocational education, living in towns/cities, with marital status: single, divorced, widowed.

Conclusions: The severity of pain assessed by means of the VAS scale significantly affects the quality of life of patients with RA evaluated with the HAQ questionnaire. Socio-demographic factors, such as: age, education, place of residence, marital status, significantly influence the value of HAQ. Patients over 65, with primary and vocational education, living in towns/cities, with single marital status, showed a significantly higher level of HAQ. There exists a correlation between the duration of the disease and the HAQ and VAS values. The stronger the pain experienced by patients, the higher the level of disability affecting the value of HAQ.

Introduction: Rheumatoid arthritis (RA) is a chronic, systemic, inflammatory connective tissue disease with an immunological base, which is characterized by inflammatory symmetrical inflammation of the joints, degradation of joint cartilage and bones. Non-articular changes and systemic complications lead to premature death of the patient as a result of the involvement of internal organs [1-5]. RA is one of the most common inflammatory rheumatic diseases. In Poland, it affects approx. 400 thousand persons with the incidence of about 50 cases per 100,000 residents, and every year between 8-16 thousand new cases are observed [3]. Incidence peak falls on the 4th and 5th decade of life, and RA incidence increases with age [6-9].

A frequent and main symptom of RA is morning rigidity, the severity and duration of which depends on the stage of disease. In addition, there are other symptoms, such as joint swelling, weakness, fatigability, muscle pain, low-grade fever, deformations, muscle weakness or weight loss. Due to the fact that the disease is also of systemic nature, it leads to extra-articular symptoms, such as: pericarditis, myocarditis, lung fibrosis and changes in kidneys [1].

The quality of life of RA patients is determined mainly by the progressive disability, persistent and chronic pain, constant fatigue and depression. Everyday activities require great commitment [10]. Moreover, patients with RA have an increased risk of falls. This is due to many factors, including the involvement of lower limb joints, weakness in muscle strength, deterioration of vision due to steroid therapy, as well as cardiovascular disorders. The fear of falling is an inseparable part of the life of RA patients who are most often over 50 years of age [11]. Adapting to everyday life with a chronic disease of the musculoskeletal system is very difficult for patients and their families. It requires numerous sacrifices in the existential sphere.

Aim of this paper: The aim of this paper was to assess the quality of life of patients with rheumatoid arthritis in terms of their physical functioning. The detailed objective of the study was to obtain answers to the following questions:

1. does the severity of pain assessed on the VAS scale affect the quality of life assessed using the HAQ questionnaire?
2. do socio-demographic factors, such as age, education, marital status, place of residence, influence the value of HAQ?
3. does the length of the disease affect the value of HAQ and VAS in the examined group of patients?

Materials and method: The research was conducted among 50 RA patients meeting the ACR (*American College of Rheumatology*) and ELUAR (*European League Against Rheumatism*) classification criteria and with a positive RF (*rheumatoid factor*) result. The research used the method of diagnostic survey, the questionnaire technique. A standardized HAQ (*Health Assessment Questionnaire*) questionnaire was used to assess the quality of life determining functional disability, which consists of 8 domains concerning everyday activity. The first one concerns dressing and washing, the second involves getting up in the morning, the third includes eating, the fourth is walking, the fifth is personal hygiene, the sixth is lifting, the seventh is grasping, the eighth includes other activities of everyday life. The task of the patients was to assess these sections on a 4-point scale which determines the degree of difficulty in performing these activities [12]. In addition, the patients answered questions about the use of special items or equipment and the use of other people's help. In the first part, the answers given by the patients were scored as follows: 0 - means performing a task without any difficulty, 1 - some difficulty involved, 2 - great difficulty, 3 - impossible to perform. If the patient answered yes to the questions about the use of the help in the second part of the questionnaire, s/he scored 2 points in the appropriate domain unless the activity was

previously assessed as impossible to perform, in which case 3 points were assigned [13]. The characteristic feature of the questionnaire is its high repeatability, regardless of the language version. It is a valuable method assessing the results of treatment of RA patients [14].

In addition, the visual and analog VAS scales were used in the research to assess the severity of pain [15]. The research also used a self-made questionnaire containing questions regarding: age of patients, education, place of residence, marital status, source of income, length of disease, living conditions and having children.

The obtained results were subjected to statistical analysis. In the research the relationship between the variables, the Spearman's rank correlation test and the Mann-Whitney U test were used to test a sample from one and different populations. In order to describe the correlation between ordinal variables, the Kendall tau coefficient was used. Statistical inference was carried out at the level of $p = 0.05$.

Results: The age of the respondents ranged from 18 to over 65. The most numerous group (60%) were persons over 65 years of age. The vast majority (42%) of respondents had vocational education. Over half (54%) of the respondents lived in the countryside. The most numerous group were persons who were married (52%). Half of the respondents lived with their spouse, 42% declared that they lived alone and 14% answered that they lived with their children. As for the offspring, the vast majority of patients (76%) had children, while the majority of respondents declared having one child (34%), 24% two children, and 10% three. When assessing the duration of RA, the subjects were divided into 4 groups. The first group were persons suffering for up to 5 years (18%), the second group were those struggling with the disease for 6-10 years (22%), the third one suffering from the disease for 11-20 years (32%). The patients suffering from RA for more than 20 years were classified in the fourth group (28%). The respondents were asked to assess their housing conditions. Over half of the respondents (60%) admitted they had good housing conditions, and the remaining respondents suggested that they were very good (36%) and average (4%). For the vast majority of respondents (86%), the source of income was a retirement or disability pension, every fourth person received help from family / friends, and one in ten was professionally active. The general characteristics of the examined group of patients are presented in Table I.

Table I. General characteristics of the studied group of patients

		Total		Age			
				65 or under		Over 65	
		N	%	N	%	N	%
Age	18-35	0	0,0	-	-	-	-
	36-50	9	18,0	-	-	-	-
	51-65	11	22,0	-	-	-	-
	Over 65	30	60,0	-	-	-	-
Education	Elementary	11	22,0	0	0,0	11	36,7
	Vocational	21	42,0	9	45,0	22	73,3
	Secondary	4	8,0	2	10,0	2	6,7
	Undergraduate	9	18,0	8	40,0	1	3,3
	Graduate/Postgraduate	5	10,0	1	5,0	4	13,3
Place or residence	Town/city	23	46,0	11	55,0	12	40,0
	Countryside	27	54,0	9	45,0	18	60,0
Marital status	single	3	6,0	1	5,0	2	6,7
	married	26	52,0	16	80,0	10	33,3
	divorced	3	6,0	0	0,0	3	10,0
	widowed	18	36,0	3	15,0	15	50,0
Living with	spouse	25	50,0	15	75,0	10	33,3
	children	7	14,0	5	25,0	2	6,7
	alone	21	42,0	3	15,0	18	60,0
	Other	0	0,0	0	0,0	0	0,0
Do you have children?	Yes	38	76,0	16	80,0	22	73,3
	No	12	24,0	4	20,0	8	26,7
How long have you been suffering from rheumatoid arthritis?	5 years or shorter	9	18,0	8	40,0	1	3,3
	6-10 years	11	22,0	6	30,0	5	16,7
	11-20 years	16	32,0	6	30,0	10	33,3
	over 20 years	14	28,0	0	0,0	14	46,7
How do you assess your housing conditions?	very good	18	36,0	9	45,0	9	30,0
	good	30	60,0	10	50,0	20	66,7
	average	2	4,0	1	5,0	1	3,3
	poor	0	0,0	0	0,0	0	0,0
What is your source of income?	retirement/disability pension	43	86,0	13	65,0	30	100,0
	I'm professionally active, have a job	6	12,0	6	30,0	0	0,0
	unemployed	0	0,0	0	0,0	0	0,0
	helped by family/friends	12	24,0	6	30,0	6	20,0

Legend: N - total number of patients examined, % - percentage share

Source: own calculations

The detailed analysis of the responses given by patients in the HAQ questionnaire is presented in Table II. The overwhelming majority of respondents (47 persons out of 50) answered affirmatively to the question about the use of aids. Almost three quarters (72.3%) of the patients used a cane, and every third examined (29.8%) a walker or crutches. Over 30% (31.9%) of the respondents moved by means of a wheelchair. Additionally, due to the difficulty in performing everyday activities, patients often needed assistance from relatives. Out of all the 4 domains, the first thing posed the biggest difficulty to the patients, namely dressing and taking care of their appearance. Out of 34 persons requiring assistance from third persons, as many as 97.1% (N = 33) required help in the first domain.

Table II. Characteristics of the studied group based on the HAQ questionnaire

Have you been able to:		Without any difficulty		With some difficulty		With great difficulty		Unable to do	
		N	%	N	%	N	%	N	%
HYGIENE	wash and wipe yourself?	24	48,0	24	48,0	2	4,0	0	0,0
	bathe in the bathtub?	4	8,0	21	42,0	14	28,0	11	22,0
	sit on the toilet and get up?	29	58,0	20	40,0	0	0,0	1	2,0
REACHING	reach for an approx. 2 kg item located just above your head and take it off?	10	20,0	18	36,0	16	32,0	6	12,0
	bend down to pick up clothes from the floor?	6	12,0	20	40,0	15	30,0	9	18,0
GRASPING	open the door in the car?	10	20,0	21	42,0	11	22,0	8	16,0
	open the previously opened jar again?	1	2,0	14	28,0	22	44,0	13	26,0
	open and close the tap?	32	64,0	16	32,0	1	2,0	1	2,0
DAILY ACTIVITIES	do different things, do shopping?	17	34,0	26	52,0	6	12,0	1	2,0
	get into the car and out of it?	9	18,0	26	52,0	14	28,0	1	2,0
	do the housework, e.g. (hoovering, gardening)	5	10,0	18	36,0	27	54,0	0	0,0

Source: own calculations

The mean of HAQ points was 2.74 points in the examined group (SD = 1.46), in the minimum range of 0.50 points and a maximum of 7.38 points. On the VAS scale, the mean was 60.52 points (SD = 17.62), in the range of 15.00 to 91.00 points (Table III). The statistical analysis using the Spearman rank test showed that the stronger the pain, the higher the degree of disability ($R = 0.744, p < 0.001$). The results are shown in Figure 1.

Table III. The relationship between the HAQ coefficient and the VAS scale

	M	SD	Min	Max	Q1	Me	Q3
HAQ	2,74	1,46	0,50	7,38	1,50	2,56	3,88
VAS	60,52	17,62	15,00	91,00	47,00	61,50	75,00

Legend: M – mean; SD – standard deviation; Min – minimum value; Max – maximum value; Q1 – lower quartile; Me – median; Q3 – upper quartile

Source: own calculations

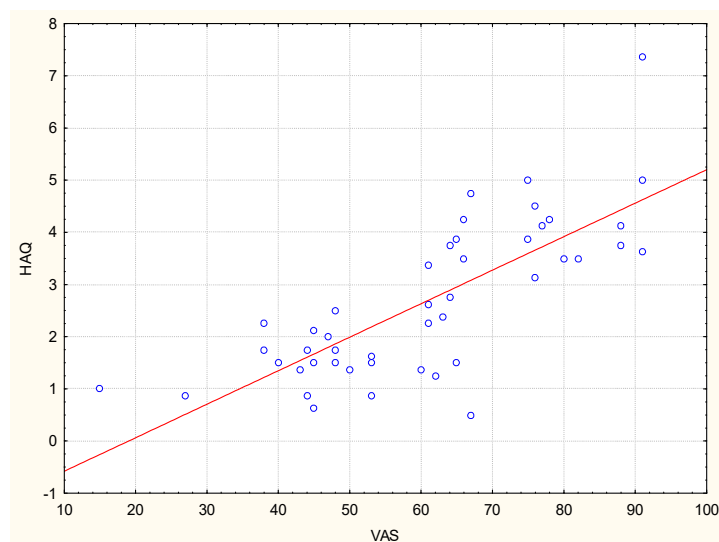


Figure 1. Relations between HAQ and VAS in the studied group of patients

The Mann-Whitney U test was used to verify the hypothesis that there is no difference in the VAS ratio due to socio-demographic variables such as age, education, place of residence, marital status and children. Statistical analysis revealed statistically significant differences in the VAS scale due to age, education, place of residence, and marital status. A higher level of pain was declared by persons over 65 (mean 67.33), with primary and vocational education (mean 66.48), living in the town/city (mean 65.24), with marital status: single, divorced, widowed (mean 71.23). The results are shown in Figure IV.

Table IV. Differences in the VAS ratio and socio-demographic variables.

	VAS	M	SD	Statistics value	Materiality level
Age	Under 65	48,30	19,81	3,101	0,0019
	Over 65	67,33	15,11		
Education	Elementary and vocational	66,48	14,48	-3,162	0,0016
	Secondary and high	47,56	21,30		
Place or residence	Town/city	65,24	20,08	-2,782	0,0054
	Countryside	52,41	16,84		
Marital status	In a relationship	48,68	16,46	4,072	0,0000
	Alone	71,23	15,59		
Do you have children?	Yes	60,56	19,80	0,940	0,3472
	No	54,91	18,87		

Legend: M – mean; SD – standard deviation

Source: own calculations

Using the Kendall tau coefficient, the relationship between the VAS ratio and the length of period in which the patient suffers from rheumatoid arthritis and housing conditions was examined. Statistical analysis showed a statistically significant relationship between the length of period in which the patient suffers from rheumatoid arthritis and the VAS scale. The longer s/he suffers from rheumatoid arthritis, the stronger the pain level (Table V). The analysis of the relationship between pain discomfort assessed on the VAS scale and housing conditions did not show significant differences in the examined group of patients.

Table V. The correlation between the VAS ratio and the period in which the patient suffers from rheumatoid arthritis and housing conditions

VAS	Kendall's tau correlation coefficient	Materiality level
How long have you been suffering from rheumatoid arthritis?	0,514	0,0000
How do you assess your housing conditions?	0,153	0,1306

Source: own calculations

When proceeding to further analysis, it was examined whether age, education, place of residence, marital status and the number of children influenced the HAQ coefficient. The Mann-Whitney U test was used to verify the hypothesis that there is no difference in the HAQ coefficient due to age, education, place of residence, marital status and having children against the alternative hypothesis that such differences occur. Statistical analysis showed statistically significant differences in the HAQ coefficient due to age, education, place of residence, and marital status. A higher level of pain was declared by persons over 65 (mean 3.10), with primary and vocational education (mean 3.15), living in the town/city (mean 3.19), with marital status: single, divorced, widowed (mean 3.33) (Table VI).

Table VI. Socio-demographic factors affecting the HAQ

HAQ		M	SD	Statistics value	Materiality level
Age	Under 65	2,20	1,76	2,693	0,0071
	Over 65	3,10	1,11		
Education	Elementary and vocational	3,15	1,22	-3,224	0,0013
	Secondary and high	2,02	1,59		
Place or residence	Town/city	3,19	1,17	-2,881	0,0040
	Countryside	2,22	1,61		
Marital status	In a relationship	2,20	1,18	2,437	0,0148
	Alone	3,33	1,51		
Do you have children?	Yes	2,95	1,51	1,874	0,0609
	No	2,08	1,04		

Legend: M – mean; SD – standard deviation

Source: own calculations

The next step was the analysis of the correlation between the HAQ ratio and the length of the period in which the patient suffers from rheumatoid arthritis and housing conditions. The Kendall tau coefficient was used for this purpose. The statistical analysis showed a statistically significant relationship between the period in which the patient suffers from rheumatoid arthritis and the HAQ scale. The longer someone suffers from rheumatoid arthritis, the stronger the pain level is (Table VII).

Table VII. The dependence of the HAQ coefficient and the period of suffering from RA and housing conditions

HAQ	Kendall's tau correlation coefficient	Materiality level
How long have you been suffering from rheumatoid arthritis?	0,483	0,0000
How do you assess your housing conditions?	0,178	0,0679

Source: own calculations

In the further part of the analysis, the relationship between the HAQ coefficient and the VAS scale in individual periods of the disease was examined. The statistical analysis showed a strong correlation between the HAQ coefficient and the VAS scale in the group of patients who have suffered for at least 6 years. In addition, it was noted that the stronger the pain, the higher the degree of disability was (Table VIII).

Table VIII. The relationship between the disease duration time and the HAQ coefficient and the VAS scale

How long have you been suffering from rheumatoid arthritis?		Spearman's rank correlation coefficient	Materiality level
VAS and HAQ	5 years or shorter	-0,405	0,2795
	6-10 years	0,791	0,0064
	11-20 years	0,722	0,0016
	over 20 years	0,707	0,0150

Source: own calculations

Discussion: RA is a chronic, systemic, progressive connective tissue disease that inevitably leads to disability in the scope of physical functioning. This is related to the occurrence of progressive degeneration in the joints and accompanying pain significantly affecting the everyday functioning of patients [1]. To assess the outcomes of treatment of RA patients, different types of questionnaires are used more and more often which assess the quality of life and disability. The questionnaires are a great tool for both the patient and the physician as they help to understand and define the goals that are best to achieve during treatment. The studied group of patients was divided into 4 subgroups according to the duration of the disease. The duration of the disease ranged from under 5 years to over 20. The patients took part in a standard interview based on the questionnaire and the HAQ questionnaire was used to assess the quality of life of RA patients. In the research presented higher levels of pain were reported in persons over 65, with primary and vocational education, living in towns/cities, with marital status: single, divorced, widowed. The same criteria were met by persons showing a higher level of HAQ, which indicates a high correlation between the level of pain and HAQ, and age, education, place of residence, and marital status.

Old age is a factor that additionally increases the level of disability. It has a negative impact on the functioning of the patient in various spheres [16]. Based on own observations, it was found that younger persons (<65 years) were characterized by a better quality of life,

especially in terms of fitness level (2.20 mean in the HAQ scale), compared to patients from other age groups. Similar results were reported by Moćko and Zurzycka yet in their research group, the younger persons were persons under 50. [16]. Based on own research, it was also found that elderly persons over 65 had higher pain levels on the VAS scale and showed a higher level of HAQ, which was associated with more severe disability. Similar results were obtained by Moćko and Zurzycka [16].

The level of education also plays a significant role. It may point to the level of awareness of one's illness, the need for treatment, and health behaviours [16]. In own research patients with basic and vocational education obtained a higher HAQ level (the mean of 3.15) indicating poorer quality of life. Patients with secondary or higher education achieved lower HAQ (the mean of 2.02). Similar results were obtained by Moćko and Zurzycka [16]. The results of own research are also consistent with the studies of Corbacho et al., in which 53 patients took part and in which it was shown that more than a half had only primary education, including not always complete, which resulted in increased unemployment (66%) due to the necessity of resigning from work in the first year of the disease [17]. It can therefore be concluded that a higher level of education also affects the possibility of undertaking work other than manual, which allows one to keep their job despite continuous disease progression. Similar results, correlating with own research, were obtained by Jiang et al., where in the study population of RA patients receiving standard care in the country with a generally accessible public healthcare system, education did not affect neither the time of diagnosis nor the treatment itself. She showed that patients with a higher level of education declared less pain (assessed by the VAS scale) and less functional disability (HAQ) during the follow-up period, and were more likely to achieve remission of pain and improve functional impairment [18].

Own analysis also showed that lonely patients suffering from RA had worse quality of life than patients who were in a relationship. Different results were reported by Moćko and Zurzycka who showed that lonely persons perceived their quality of life better as measured with the HAQ scale [16]. Krause et al. who conducted a study among 100 persons meeting the ACR criteria, discussed the factors affecting the disability of patients with RA. They took into account the occurrence of depressive symptoms in patients that adversely affect the course of the disease [19]. It can therefore be concluded that lonely patients are more likely to experience depression due to the progressive disability and fear that they will not be able to cope with everyday activities, which further intensifies the impact of the disease on their functioning.

In own research, an important significant relationship was also found between the duration of the disease and the degree of disability. From the analysis it results that the stronger the pain experienced by the patients, the higher the level of HAQ indicating greater incompetence and poorer quality of life. The tendency to decrease the quality of life of those researched along with the duration of the disease was noticed. Similar results were obtained by Moćko and Zurzycka in the group of 55 persons hospitalized in the rheumatology ward of dr Jan Gawlik Hospital in Sucha Beskidzka [16]. Due to the progressive nature of RA, the functioning of patients with long-term RA is getting worse. Such conclusions were presented by Sierakowska et al. based on the research conducted among 277 patients from 6 different rheumatology institutes in Poland. It showed that with the longer duration of the disease, difficulties in everyday activities increase [20].

Miedziak et al. examined 50 persons treated in the Rheumatology Outpatient Clinic. Comparing the results before applying biological treatment based on the HAQ questionnaire, it can be concluded that the results obtained before the treatment in individual domains correlate with own results, carried out in the group of patients not in the course of biological

therapy. This is, therefore, evidence of major difficulties in the functioning of patients with RA. For example, the domain concerned with dressing was performed with great difficulty by 50% in own research and 52% in research conducted by Miedziak et al. Another domain, i.e. getting up, was performed with some difficulty by 54% of patients in own research, while in studies by Miedziak et al. 56% performed it with great difficulty. Reaching was accomplished with some difficulty by 36% of patients according to own research, while according to studies by Miedziak et al. 44% performed it with great difficulty. Everyday activities, such as hoovering or gardening were difficult to perform for 54% of patients in own research and in the research conducted by Miedziak et al. [21].

Also, the level of pain perceived by the VAS in both cases was quite high. In Miedziak et al. before biological treatment, the average pain value on the VAS scale was 73.70, while in own studies (the patients who were not undergoing biological treatment), the mean value was 60.52 [21].

In addition, own research showed that in the total of 43 patients, the source of income was a pension or disability pension, and only six were professionally active. This may be related to both the level of education and the progressive disability of RA patients. Bodur et al. examined 49 patients diagnosed with RA against the ACR criteria. In his research only 11 persons were employed and 38 subjects did not work. This indicates a high percentage of incapacity for work in RA patients. Based on the obtained results, he suggested implementing solutions that could improve the employment of patients by recognizing problems related to work at early stages of the disease by the doctors, implementing facilities at the workplace, gaining support of co-workers and employers. This would lead to the decrease in occupational disability, retention of paid work and an increase in the productivity of working patients [22].

In conclusion, disability prevention is a common goal for the patient and the attending physician. Reducing the degree of disability gives the patient greater opportunities both in terms of maintaining employment and coping with everyday activities. This has a huge impact on improving the quality of life of patients, both in terms of physical and mental functioning.

Conclusions:

1. The severity of pain assessed by means of the VAS scale significantly affects the quality of life of patients with RA examined using the HAQ questionnaire.
2. Socio-demographic factors, such as age, education, place of residence, marital status, have a significant impact on the value of HAQ. Patients over 65, with primary and vocational education, living in towns/cities, with single marital status, showed a significantly higher level of HAQ.
3. There exists a correlation between the duration of the disease and the HAQ and VAS values. The stronger the pain experienced by patients, the higher the level of disability affecting the value of HAQ.

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