Depression and quality of life in rheumatoid arthritis individuals and stable health individuals: a comparative study

Depressão e qualidade de vida em indivíduos com artrite reumatoide e indivíduos com saúde estável: um estudo comparativo

Depresión y calidad de vida en individuos con artritis reumatoidea e individuos con salud estable: un estudio comparativo

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ABSTRACT | The objective of this study was to verify the depression occurrence and changes in quality of life (QoL) in individuals with rheumatoid arthritis (RA). Sixty individuals took part of the study, who were divided into 2 groups with 30 participants each. The Test Group had RA patients, and the Control Group had stable health individuals. QoL was assessed by the Medical Outcomes Study 36-Item Short-Form Healthy Survey (SF-36) and depression was evaluated by means of the Beck Depression Scale (BDS). In order to make comparisons between the groups regarding the scores of each SF-36 domain, we used the Mann-Whitney test and for the "general health" data of the SF-36, the χ^2 test was applied. In order to compare the groups regarding the total score of depression and scores of each category of depression, the Wilcoxon-Mann-Whitney (WMW) and χ^2 tests were used, respectively. For the general "health state" variables of the SF-36 and classification of depression, we calculated the crude and adjusted Odds Ratio through logistic regression modeling. The significance level was set at 5%. The results showed that there were differences among the groups for the eight SF-36 domains, indicating that individuals with RA present lower rate of QoL and self-evaluation in health (adjusted OR=14.38) and that 63.33% of the participants with RA present some degree of depression. We concluded that RA causes a negative impact in the QoL and the depression can be considered a symptom associated to the decrease of the functional capacity due to the disease.

Keywords | Arthritis, Rheumatoid; Depression; Quality of Life.

RESUMO | O objetivo deste estudo foi verificar a ocorrência de depressão e alterações da qualidade de vida (QV) em indivíduos com artrite reumatoide (AR).Participaram da pesquisa 60 indivíduos, divididos em 2 grupos com 30 cada, sendo o Grupo Teste composto por indivíduos com AR e o Grupo Controle composto por indivíduos com saúde estável. A QV foi avaliada pelo *Medical Outcomes Study 36-Item Short-Form Healthy Survey* (SF-36) e a depressão, pela Escala de Depressão de Beck (BDS). Para estabelecer comparações entre os grupos quanto aos escores de cada domínio do SF-36, utilizamos o teste de Mann-Whitney e, para os dados do "estado de saúde em geral" do SF-36, o teste do χ^2. Para comparar os grupos quanto ao escore total de depressão e quanto aos escores de cada categoria de depressão, empregamos respectivamente os testes Wilcoxon-Mann-Whitney (WMW) e χ^2. Para as variáveis "estado de saúde" em geral do SF-36 e classificação da depressão, calculou-se a *Odds Ratio* bruta e ajustada por meio de modelagem de regressão logística. O nível de significância foi estabelecido em 5%. Os resultados mostraram que houve diferenças entre os grupos nos oito domínios do SF-36, indicando queindivíduos com AR apresentam menores índices de QV e autoavaliação em

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saúde (ORajustada=14,38) e que 63,33% dos participantes com AR apresentam algum grau de depressão. Concluímos que a AR causa um impacto negativo na QV e que a depressão poder ser considerada um sintoma associado à diminuição da capacidade funcional decorrente da doença.

Descritores | Artrite Reumatoide; Depressão; Qualidade de Vida.

RESUMEN | El objetivo de este estudio fue verificar la ocurrencia de depresión y alteraciones de la calidad de vida (CV) en individuos con artritis reumatoidea (AR). Participaron de la investigación 60 individuos, divididos en 2 grupos de 30, siendo el Grupo Test compuesto por individuos con AR y el Grupo Control compuesto por individuos con salud estable. La CV fue evaluada por el *Medical Outcomes Study 36-Item Short-Form Healthy Survey* (SF-36) y la depresión, por la Escala de Depresión de Beck (BDS). Para establecer comparaciones entre los grupos en cuanto a los escores de cada dominio del SF-36, utilizamos el test de Mann-Whitney u, para los datos del "estado de salud en general" del SF-36, el test del χ^2. Para comparar los grupos en cuanto al escore total de depresión y en cuanto a los escores de cada categoría de depresión, empleamos respectivamente los tests Wilcoxon-Mann-Whitney (WMW) y χ^2. Para las variables "estado de salud" en general del SF-36 y clasificación de la depresión, se calculó la *Odds Ratio* bruta y ajustada por medio de modelado de regresión logística. El nivel de significancia fue establecido en 5%. Los resultados mostraron que hubo diferencias entre los grupos en los ocho dominios del SF-36, indicando que individuos con AR presentan menores índices de CV y autoevaluación en salud (OR ajustada=14,38) y que 63,33% de los participantes con AR presentan algún grado de depresión. Concluimos que la AR causa un impacto negativo en la CV y que la depresión puede ser considerada un síntoma asociado a la disminución de la capacidad funcional resultante de la enfermedad.

Palabras clave | Artritis Reumatoide; Depresión; Calidad de Vida.

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic, multisystemic autoimmune and inflammatory disease, which can result in significant functional disability[1,2] and depressive symptoms[3-5]. These changes may have a negative influence on the performance of daily living and work activities, with consequent impact on the quality of life (QoL)[6].

Studies evaluating the impact of RA on QoL showed that these patients have significantly lower levels of QoL when compared with the general population[7,8], and lower functional capacity scores when compared to other chronic diseases[6,9,10]. Other studies have also shown that changes in QoL can be seen even in the earliest stages of the disease progression[7,11].

Among the factors that could directly affect the reduction of QoL in patients with RA, depression deserves special attention[3-5,12]. Sharpe *et al.*[3] demonstrated a close relationship between depression and the early stages of disability in patients with RA, and also that these patients became more depressed with the evolution of the disease. Costa *et al.*[13] and Mella *et al.*[14] found that the prevalence of depressive symptoms in patients with RA is of 33.7 and 53.2%, respectively. The literature also indicates that depression is more common in RA patients than in healthy individuals[15].

Although the literature indicates that RA causes a negative impact on the QoL[7] and that depression is a very common symptom among these patients[13,14], the results of the study of QoL and depression and their relationship in patients with RA in a clinical environment may support and enable more comprehensive and effective treatment approaches to patients, since such results would provide a more solid foundation for an interdisciplinary intervention process. Aspects involved in the QoL and the occurrence of depression could then also be the target of the clinical work of health professionals involved in the process of treating the patient with RA.

Therefore, the aim of this study was to verify the occurrence of depression and changes in QoL in individuals with RA.

METHODOLOGY

Participants

The study included 60 individuals, divided into 2 groups with 30 participants each: the Test Group (TG), with individuals diagnosed with RA according to the criteria of the American College of Rheumatology[16] and the Control Group (CG), with individuals not diagnosed with the disease or any pathology in the musculoskeletal and neurological systems or disabling complaints in these systems.

Participants in the TG came from the Rheumatology Ward of Clinic Maria da Gloria, in UFTM (Universidade Federal do Triângulo Mineiro), where they were under medical supervision

and individualized drug therapy. Individuals in the CG were selected by convenience so stay paired with the participants of the TG to the variables: age, gender, ethnicity and education level. All participants were selected according to the following inclusion criteria: minimum age of 25 years, adequate cognitive level to understand the procedures and guidelines given and having signed the informed consent form for participation in the study, after reading the clarification terms.

The characterization of the groups according to the matching variables is presented in Table 1. To check whether there were differences between groups, the Student's t test was used for the age variable, and the χ^2 test was used for gender, ethnicity and education level. The results presented no differences between the groups, showing that they were homogeneous in terms of these variables ($p>0.05$).

Regarding the evolution time of the RA in the TG participants, the average was 108.76 months, with a minimum of 9 and maximum of 480 months, and 5 of 30 individuals were not able to answer.

As for medications used by individuals in the TG for the treatment of RA at the time of the data collection, 20 (66.66%) used a combination of methotrexate, hydroxychloroquine and prednisone, 5 (16.66%) were taking methotrexate and prednisone; 2 (6.66%) were taking only hydroxychloroquine; 1 (3.33%) used methotrexate, hydroxychloroquine, chloroquine, and prednisone; 1 (3.33%), was taking methotrexate, hydroxychloroquine, leflunomide and prednisone, and 1 (3.33%) was taking a combination of methotrexate, leflunomide and prednisone.

Table 1. Characterization of Test Group and Control Group under the matching variables

Matching variables	TG	CG
	Mean (min./max.)	Mean (min./max.)
Age	55.7(34/78)	51.8 (35/75)
	n (%)	n (%)
Gender		
Female	25 (83.33)	26 (86.67)
Male	5 (16.67)	4 (13.33)
Ethnicity		
White	21 (70.00)	23 (76.67)
Non-white	9 (30.00)	7 (23.33)
Education (years)		
0 - >1	3 (10.00)	0 (0.00)
1 - 3	5 (16.67)	3 (10.00)
4 - 7	12 (40.00)	7 (23.33)
8 - 10	10 (33.33)	18 (60.00)
15 or more	0 (0.00)	2 (6.67)

TG: Test Group; CG: Control Group; min.: minimum; max.: maximum

Assessment tools

For assessment of QoL, we used the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), in a version validated into Portuguese by Ciconelli *et al.*[17]. This is a generic questionnaire that covers eight aspects: functional capacity (ten items), physical aspects (four items), pain (two items), general health condition (five items), vitality (four items), social aspects (two items), emotional aspects (three items) and mental health (five items), and also one question for comparative evaluation between the current health condition and that of one year ago. Each component ranges from 0 to 100, 0 being the worst and 100 the best score.

To assess depression, the Beck Depression Scale (BDS) was applied, translated and validated into Portuguese by Gorenstein and Andrade [18]. It consists of 21 items; in each one of them, it is possible to give an answer whose score ranges from zero to three (absent, mild, moderate and severe), allowing to quantify the intensity of the symptom. The score ranges from 0 to 63, and the higher the score, the higher the level of depression.

Data regarding age, gender, ethnicity and education level were collected and noted on the initial screening form. For participants of the TG, time of progression of the disease and the data extracted from medical records relating to the drugs used were also noted.

Data collection procedure

After reading the clarification term and signing the informed consent for participating in the study, all participants went through the initial screening interview and filled the SF-36 and BDS questionnaires, the study's assessment instruments. These procedures took an average 30 minutes and were conducted in the form of joint reading, always with the same examiner. Data collection with the participants in the TG was held in the premises of the Maria da Gloria Ambulatory in UFTM after the patients' medical consultation, and the time and place for data collection of data in the CG were scheduled according to the preference of the participants.

This study is part of a broader research project on assessment of pain, depression, functional capacity and QoL in rheumatic diseases, approved by the Research Ethics Committee of UFTM (protocol no. 1.635).

Data analysis procedure

To compare the TG and the CG regarding the scores of each domain of the SF-36, the Mann-Whitney test was used, and, for the data on the "general health condition" of the SF-36, the χ^2 test was used. As for the total depression score and the scores of each specific category of depression, the Wilcoxon-Mann-Whitney (WMW) and χ^2 tests were employed, respectively. All tests respected the normality indicated by the Shapiro-Wilk test.

The "general health condition" variables of the SF-36 and the "classification of depression", both ordinal, with more than two categories, were transformed into "dummy variables", and the crude and adjusted Odds Ratio (OR) were calculated through the logistic regression model. First, bivariate models with each of the variables studied were processed, and those with significance of up to 20% were selected for the multivariate models. Then the full logistic regression model was run with the technique "stepwise backward selection." Two models were created: one for the "general health condition" and variable and another for "classification of depression." It was observed that the variable referring to the "classification of depression" interacted with the "general health condition", and that functional capacity, measured by the SF-36, interacted with depression. Thus, for purposes of adjustment, the "classification of depression" was maintained in the "general health condition" model, and "functional capacity" of the SF-36 was maintained in the "classification of depression" model. The significance level for the maintenance of adjustment variables was 20%>p>5%. For statistical tests, the significance level of 5% (p<0.05) was established, and all analyzes were performed using the Stata 9.2® software.

Table 2. Means and standard deviations of the Test Group and Control Group for the scores of each domain of the SF-36

Domains	TG	CG	p-value
	Mean±SD	Mean±SD	
Functional capacity	43.33±28.02	88.00±15.51	<0.0001
Physical aspects	35.00±39.72	87.50±23.44	<0.0001
Pain	40.80±24.71	78.00±21.24	<0.0001
General health condition	47.80±23.09	80.86±15.41	<0.0001
Vitality	50.67±26.25	72.33±20.95	<0.002
Social aspects	59.58±28.37	79.53±27.16	<0.006
Emotional aspects	41.11±43.49	78.88±33.31	<0.002
Mental health	55.60±25.28	72.60±17.96	<0.005

TG: Test Group; CG: Control Group; SD: standard deviation

RESULTS

Results related to quality of life

The results showed that there were differences between groups in all domains of the SF-36 (Table 2), indicating that individuals with RA have lower levels of QoL.

As for the "general health condition", also assessed by the SF-36, which investigates if the individual feels better or worse nowadays compared to a year ago, we observed that 30% of the participants in the TG consider their health "rather worse now", and 10% consider it "much worse now," compared to only 3.33% of the participants in the CG. Upon carrying out the logistic regression analysis to calculate the crude OR, we observed a difference in the "rather worse now" category. After the adjustment of this category for the confounding variable "depression", the OR decreased, although maintaining significance, indicating that patients in the TG rated their current health in general as "rather worse now," because of the RA and not the depression (Table 3).

Results related to depression

Table 4 shows that 63.33% of the participants in the TG had some degree of depression (mild, moderate or severe), compared to only 13.34% of the CG. The results showed that there were differences between the

Table 3. Frequencies and percentages of participants in the Test Group and Control Group according to the "general health condition" categories of the SF-36 (values of crude and adjusted Odds Ratio)

General health condition	TG	CG	p-value	OR	p-value	OR	p-value
	n (%)	n (%)		Crude		Adjusted*	
Much better now	5 (16.67)	11 (36.67)	<0.007	0.90	>0.05	0.87	>0.05
Rather better now	6 (20.00)	4 (13.33)		2.99	>0.05	2.54	>0.05
Same as one year ago	7 (23.33)	14 (46.67)		1.00	-	1.00	-
Rather worse now	9 (30.00)	1 (3.33)		18.00	<0.02	14.38	<0.03
Much worse now	3 (10.00)	0 (0.00)		-	-	-	-

*Adjusted by the Beck Depression Scale
TG: Test Group; CG: Control Group; OR: Odds Ratio

groups (p<0.05), confirmed by calculating the crude OR in the "mild depression" category. However, after adjustment of this category for the confounding variable "functional capacity" of the SF-36, there was a loss of statistical significance, indicating that the domain "functional capacity" can influence the category "mild depression" as much as the RA.

When comparing the total scores, it was observed that individuals with RA have higher rates of depression (p<0.05) (Table 5).

DISCUSSION

The results showed that there were differences in the eight domains of the SF-36, indicating that individuals with RA present a decrease in QoL. West and Jonsson reported lower scores for the eight domains of the SF-36 in patients with RA in the early stages of the disease[7]. It is noteworthy, however, that in this study, although all dimensions of health have been compromised according to the scores of the SF-36, "functional capacity", "physical aspects", "pain" and "general health condition" were the most affected domains in the TG, which may suggest that these variables are the most relevant among those contributing to the reduction in QoL. Salaffi *et al.*[9] showed that although all domains of the SF -36 were significantly affected in patients with inflammatory rheumatic disease, individuals with RA had the worst scores for the "physical aspect" domain. Ovayolu *et al.*[10] also showed that the scores for the "physical aspect" of the SF-36 were worse for patients with RA. Other studies pointed to "functional capacity"[6] and "pain"[19,20] as being the most affected domains in the QOL of these patients.

The study of Mota *et al.*[11] showed reduced scores in the SF-36 in patients with RA in the early stages of the disease. However, unlike the results presented here, in addition to the "limitation due to physical aspects" domain, the "limitation due to emotional aspects" was one of the most compromised. Corbacho and Dapueto[21] also reported reduced scores in the dimension of well-being, both physical and emotional, in patients with RA.

The literature points to depression as an important symptom in RA that may have a negative impact on QoL[3-5]. The etiology of depression in patients with RA may be related to several factors, such as pain, reduced functional capacity, disease duration and activity[22]. Although the findings of studies by Costa *et al.*[13] and Ho *et al.*[12] demonstrate an association between the index of disease activity (DAS 28) and depression, studies by Kojima *et al.*[5] and Melikoglu and Melikoglu[23] found no association between these factors, suggesting that the occurrence of depression in patients with RA may be associated with other variables, such as physical and functional disability. The study by Mella *et al.*[14] shows that the prevalence of depressive symptoms in RA patients may be related to the inflammatory nature of the disease, characterized by increased cytokines, leading to neurochemical, neuroendocrinal and behavioral changes, which may be associated with depression.

The results of this study show that 63.33% of the patients in the TG have some degree of depression (mild, moderate or severe), compared to only 13.34% of the CG. It is noteworthy that the prevalence of depression in the sample of individuals with RA studied here was higher than that found in studies by Costa *et al.*[13], Mella *et al.*[14] and HO *et al.*[12], which were 33.7, 53.2 and 26%, respectively.

Table 5. Means and standard deviations of the Test Group and Control Group regarding total scores of the Beck Depression Scale

	TG	CG	p-value
	Mean±SD	Mean±SD	
BDS	18.7±13.58	8.66±6.74	<0.003

TG: Test Group; CG: Control Group; p: statistical significance; DP: standard deviation; BDS: Beck Depression Scale

Table 4. Frequencies and percentages of participants in the Test Group and Control Group according to the degree of depression

BDS	TG	CG	p-value	OR	p-value	OR	p-value
Categories	n (%)	n (%)		Crude		Adjusted*	
No depression	11 (36.67)	26 (86.67)	<0.002	1.00		1.00	
Mild depression	10 (33.33)	2 (6.67)		11.81	<0.005	6.27	>0.05
Moderate depression	4 (13.33)	2 (6.67)		4.72	>0.05	0.14	>0.05
Severe depression	5 (16.67)	0 (0.00)		-	-	-	
Showing some degree of depression	19 (63.33)	4 (13.34)					

*Adjusted by functional capacity (SF-36)
TG: Test Group; CG: Control Group; OR: Odds Ratio; BDS: Beck Depression Scale

Data from this study also show that there were statistically significant differences between the two groups, confirmed by the calculation of the crude OR in the "mild depression" category. However, after adjustment of this category for the confounding variable "functional capacity" of the SF-36, there was loss of statistical significance, suggesting that the domain "functional capacity" can influence the category "mild depression" as much as the presence of RA. There are indicators in the literature confirming this relationship between functional ability and depression in individuals with RA. Katz and Yelin[24], for example, have shown increased rates of depression concomitant with reduced functional capacity, and Sharpe *et al.*[3] observed not only a close relationship between depression and the early stages of disability, but also that patients with RA have become more depressed with the evolution of the disease.

As for the "general health condition", assessed by the SF-36, which investigates how much better or worse the individual feels nowadays compared to a year ago, the results showed that there were differences between the groups. We observed that 30% of the participants in the TG consider their health "rather worse now," and 10% consider it "much worse now," compared to only 3.33% of the participants in the CG. The logistic regression analysis showed differences in the "rather worse now" category and, even after adjustment for the confounding variable "depression", assessed by BDS, the significance was maintained. These results indicate that RA patients rated their current health in general as "rather worse now," because of the disease itself and not of the depression, even when a significantly higher prevalence of depression was observed among these patients.

The results of this study show evidence that there is a relationship between RA, depression and QoL, and that functional capacity is a relevant variable that interferes with QoL in individuals with RA. These findings suggest the possibility of introducing a systematic assessment of QoL and depressive symptoms in routine clinical evaluation of patients with RA, together with the traditional evaluation. Thus, different forms of interventions designed by interdisciplinary teams can act directly on the factors that lead to loss of QoL, such as pain, depression and disability.

It is also worth noting that the performance of multicenter studies in regions with different sociodemographic profiles and with the same approach of this research could confirm or complement the results found here, considering that regionalization can be understood as one limitation of the study. Moreover, conducting cohort studies could confirm more properly the causal link between the exposure factors and outcomes studied here. We also emphasize that researches like this one are scarce in the scientific literature, although they are of great academic and clinical usefulness, this being its main strength.

CONCLUSION

Based on the results, it can be concluded that RA has a negative impact on all domains of QoL, depression can be considered an associated symptom, and that the general health condition suffers negative interference.

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