Higher pain intensity is associated with less resilience in patients with rheumatoid arthritis

Maior intensidade de dor está associada com menor resiliência em pacientes com artrite reumatoide

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ABSTRACT

BACKGROUND AND OBJECTIVES: Rheumatoid arthritis is an inflammatory, chronic and autoimmune disease that causes joint damage and can lead to physical disability. Patients with chronic and debilitating diseases such as arthritis need to adapt to the new reality. These changes may have less impact on patients with greater self-efficacy and resilience. Psychosocial factors influence the quality of life (QoL) of these patients, so the aim of this study was to assess resilience in this population and its relationship with pain, functional capacity and disease activity.
METHODS: This is a cross-sectional study carried out with patients at a medical specialties clinic, using a sociodemographic, a clinical-laboratory, a health assessment, a disease activity score questionnaires and the Wagnild and Young Resilience Scale. The data was analyzed using Fisher's Exact, Chi-square, Student's *t* and ANOVA tests.
RESULTS: 120 patients participated in the study, 89.2% female, mean age 56.9 ± 10.7 years. Pain was classified as severe by 40.8%, 65.8% had disease in remission and 50.8% had mild disability. The resilience of 49.2% was high. There was an association between lower resilience and: presence of painful joints (p=0.004) and greater pain intensity (p=0.014). There was a lower average of resilience (130.95) in participants with severe disability.
CONCLUSION: Patients with less resilient rheumatoid arthritis had greater functional disability, painful joints and greater pain intensity. In addition, from the moment additional measures are adopted, such as educational actions and behavioral strategies, with an emphasis on resilience, which help in the control and clinical outcome of the disease, there will certainly be a positive impact on the quality of life of these patients.
Keywords: Health systems, Musculoskeletal pain, Pain, Psychological resilience, Rheumatoid arthritis.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A artrite reumatoide é uma doença inflamatória, crônica e autoimune, que acarreta lesão articular e pode ocasionar incapacidade física. Pacientes com doenças crônicas e debilitantes como a artrite necessitam se adaptar à nova realidade. Essas mudanças podem ser menos impactantes em pacientes com maior autoeficácia e resiliência. Os fatores psicossociais exercem influência na qualidade de vida (QV) desses pacientes, portanto o objetivo deste estudo foi avaliar a resiliência nessa população e sua relação com dor, capacidade funcional e atividade da doença.
MÉTODOS: Trata-se de uma pesquisa transversal, realizada com pacientes de uma clínica de especialidades médicas, através dos questionários sociodemográfico, clínico-laboratorial, de avaliação da saúde, de escore da atividade da doença,e avaliação da saúde, de escore da atividade da doença, e da escala de Resiliência de Wagnild e Young. A análise dos dados foi feita através dos testes Exato de Fisher, Qui-quadrado, *t* de Student e ANOVA.
RESULTADOS: Participaram do estudo 120 pacientes, sendo 89,2% do sexo feminino, com média de idade de 56,9±10,7 anos. A dor foi classificada como intensa por 40,8%; 65,8% dos pacientes estavam com doença em remissão e 50,8% com incapacidade leve. A resiliência de 49,2% foi elevada. Foi verificada uma associação entre menor resiliência e: presença de articulações dolorosas (p=0,004) e maior intensidade de dor (p=0,014). Foi verificada menor média de resiliência (130,95) nos participantes com incapacidade grave.
CONCLUSÃO: Pacientes com artrite reumatoide menos resilientes apresentaram maior incapacidade funcional, articulações dolorosas e maior intensidade de dor. Além disso, a partir do momento em que se adota medidas adicionais, tais como ações educativas e estratégias comportamentais, com ênfase na resiliência, que auxiliem no controle e no desfecho clínico da doença, certamente haverá impacto positivo na QV dos pacientes.
Descritores: Artrite reumatoide, Dor, Dor musculoesquelética, Resiliência psicológica, Sistemas de saúde.

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HIGHLIGHTS
- People who were more resilient had less pain.
- Less resilient patients had more painful joints.
- Resilience can help the clinical outcome of the disease.

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INTRODUCTION

Rheumatoid arthritis (RA) is an inflammatory, chronic, autoimmune disease that causes joint damage and can lead to physical disability[1]. This disease affects 1% of the worldwide population[2,3]. RA can cause a progressive decrease in functional capacity, impairing activities of daily living[4].

Patients with chronic and debilitating diseases such as RA need to adapt to a new reality. These changes may be less impacting on patients with greater self-efficacy and resilience, as they have shown better results in controlling pain intensity, as well as physical and mental functions[5,6].

In the health field, resilience has been measured and identified in patients with chronic diseases and, when high, it is associated with greater acceptance of the disease, improved self-care, reduced symptoms and improved quality of life (QoL), which can be beneficial and contribute to therapy and prognosis[7].

Since in RA the psychosocial factors affect patients' QoL[8], there is a need to assess resilience in the affected population in order to contribute to knowledge about the relationship between these factors and the clinical variables of the disease. In addition to pharmacological therapy and patient and family education, behavioral therapeutic approaches aim to increase resilience scores and can be part of routine patient assessment. The interest in measuring resilience and ways of modulating it could be an alternative for minimizing pain in RA patients, improving QoL and reducing the consumption of drugs for this purpose. Research on this subject is still scarce, so this study can contribute to this gap in knowledge, since it sought alternative, non-pharmacological ways of minimizing pain in RA patients.

Given the above, together with evidence from the literature showing the positive influence of constructs such as resilience on health and symptom control in chronic patients[9,10], the aim of this study was to assess the resilience of RA patients and its relationship with pain, functional capacity and disease activity.

METHODS

This is a cross-sectional study. The research was carried out after approval by the Research Ethics Committee (*Comitê de Ética em Pesquisa* - CEP) of the Northwest Rio Grande do Sul State Regional University (*Universidade Regional do Noroeste do Estado do Rio Grande do Sul* - UNIJUI - Opinion Number 3.298.736). Data collection took place between April and October 2019, at a medical specialty clinic that provides care through the Brazilian Public Health System (*Sistema Único de Saúde* - SUS), privately and through health insurance plans in Ijuí, Rio Grande do Sul. This article was organized following the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement[11]. The sample calculation for the descriptive statistical power of this study required 122 people, considering that the RA population of this clinic was 400 people; the sample error rate was 5%, with homogeneous distribution.

Individuals who met the following criteria were included in this study: RA diagnosis with at least one year's duration, according to the ACR/EULAR 2010[12] criteria; regular follow-up with a rheumatologist at the clinic where the data was collected; and a minimum age of 18 years. Patients diagnosed with fibromyalgia or other inflammatory connective tissue diseases other than RA and with cognitive difficulties were excluded. All participants signed the Free and Informed Consent Term (FICT).

Data collection

The sociodemographic variables: age, gender, schooling, income, marital status, occupation, smoking and type of health insurance (supplementary health, SUS or none/private) were collected using questionnaires. Patients who smoked at the time of the survey or previously were considered to be smokers.

The clinical, laboratory and therapeutic profile included the following parameters: C-reactive protein (CRP), rheumatoid factor (RF), anti-cyclic citrullinated peptide antibody (anti-CCP), time since onset of symptoms, time since diagnosis, treatment modalities, painful and swollen joints, use of antidepressants and comorbidities. The drugs considered were those used for RA and other comorbidities, in continuous use; the time of symptoms was considered to be the time when the first symptoms appeared until the diagnosis was made; the duration of the disease referred to the date of diagnosis until the time of the interview; painful and swollen joints were assessed by palpation during the physical examination, considering 28 joints; and laboratory data referred to tests collected up to 15 days before the consultation, requested by the doctor and carried out in a third-party laboratory hired by the patient.

The patients' functional status was assessed using the Health Assessment Questionnaire (HAQ). The value of the disability index (HAQ-DI) was interpreted as follows: mild disability (HAQ from zero to 1), moderate disability (HAQ>1 to 2) and severe disability (HAQ>2 to 3)[13].

Pain intensity was assessed using the visual analog scale (VAS). Scores less than or equal to 34 indicate "mild pain", between 35 and 67 "moderate pain" and greater than or equal to 67 "severe pain"[14].

The Disease Activity Score (DAS 28) was used to assess disease activity. This score assesses the clinical state of patients and comprises four variables: painful and swollen joints among 28 joints, C-reactive protein (CRP) and pain intensity through the VAS[15].

The Wagnild and Young Resilience Scale[16] was used to measure resilience. This scale comprises 21 items, with scores ranging from 25 to 175. A score of < 121 indicates low resilience, 121-146 indicates moderate resilience and > 147 indicates high resilience.

The sociodemographic questionnaire, the HAQ and the resilience scale were administered by previously trained collectors. Data such as VAS, DAS 28 and the number of painful and swollen joints were obtained by a rheumatologist. Clinical, laboratory and therapeutic information was taken directly from the participants' medical records.

Statistical analysis

The data was analyzed using the Statistical Package for Social Sciences (SPSS) software, version 17.0. The Kolmogorov-Smirnov test was used to assess normality. A descriptive analysis was

used, with absolute and percentage values, lower and upper limits, mean, standard deviation and coefficient of variation. Fisher's exact test and the chi-square test were used to compare categorical variables (high and low resilience), and Student's *t*-test and ANOVA were used to compare means. The significance level was p<0.05. For statistical analysis purposes, the categories were grouped into low and moderate resilience, with a cut-off point < 147 and high resilience > and equal to 147. Similarly, for statistical purposes, the VAS categories were grouped into no pain/mild pain and moderate/severe pain. The data was double entered independently and checked for errors and inconsistencies.

RESULTS

A total of 120 patients took part in this study, the majority of whom were female (89.2%), with a mean age of 56.9 ± 10.7 years; 68.3% said they lived with a partner and the majority had completed elementary school (78.3%). As for their work profile, 51.7% of the patients worked from home. Table 1 shows that the majority (78.3%) came from SUS.

Table 1 shows the resilience of the participants, associated with sociodemographic data. There was an association between high resilience and the following variables: having completed high school or above (p=0.021), having an income of more than one minimum wage (p=0.010), not smoking (p=0.047), having access to healthcare through a supplementary plan (p=0.021), and being without a partner (p=0.037). This last variable was also found to be associated with lower functional disability according to HAQ (p=0.035). Patients with supplementary health insurance also had higher levels of education (p=0.001), higher income (p=0.005) and lower functional disability according to HAQ (p=0.023).

An association was found between resilience and painful joints, i.e. those patients who had painful joints on physical examination had lower resilience (p=0.004), as shown in table 2. As for pain intensity, assessed by the VAS, patients with moderate/severe pain scored lower on the resilience scale (p=0.014). In addition, regarding the results shown in table 3, referring to disease activity measured using DAS 28, it was found that 65.8% of patients were in remission, and of these, 36.7% had high resilience, with no association between these variables. Another result of this study was the association between painful and swollen joints (p=0.001).

Table 3 shows the descriptive measures of the research participants' resilience according to the results of using DAS 28, HAQ and VAS instruments. The table shows that the lowest mean resilience score (130.95) was among participants classified as having a severe HAQ, which is statistically significant (p<0.001).

Table 4 shows the resilience of patients with RA, according to the therapy used. It was found that 52.5% of patients used up to 5 drugs (± 2.6). It was also found that among the treatment modalities, the drug most used to treat RA was methotrexate (59.2%). Of the patients using conventional synthetic disease-modifying drugs (DEMARDcs), 24.2% of them used these drugs in combination therapy. There was no statistical association between the variables shown in Table 4 and resilience.

Table 1. Resilience of patients with rheumatoid arthritis according to sociodemographic data - Medical specialties clinic in the municipality of Ijuí - April/2019 to October/2019, n = 120, Ijuí, RS, Brazil, 2019.

Sociodemographic variables		≥ 147	< 147	Total	p-value
Gender	Male	7 (5.8)	6 (5.0)	13 (10.8)	0.978
	Female	52 (43.3)	55 (45.8)	107 (89.2)	
Age	Under 60 years old	34 (28.3)	35 (29.2)	69 (57.5)	0.721
	60 years or older	25 (20.8)	26 (21.7)	51 (42.5)	
Marital status	With partner	35 (29.2)	47 (39.2)	82 (68.3)	0.037*
	No partner	24 (20.0)	14 (11.7)	38 (31.7)	
Education	Up to elementary school	41 (34.2)	53 (44.2)	94 (78.3)	0.021*
	High school or above	18 (15.0)	8 (6.7)	26 (21.7)	
Income	Up to 1 minimum wage	21 (17.5)	36 (30.0)	57 (47.5)	0.010*
	More than 1 minimum wage	38 (31.7)	25 (20.8)	63 (52.5)	
Smoking	Yes	15 (12.5)	26 (21.7)	41 (34.2)	0.047*
	No	44 (36.7)	35 (29.2)	79 (65.8)	
Profession	Housekeeping/cleaning	24 (20.0)	38 (31.7)	62 (51.7)	0.029*
	Work in agriculture	14 (11.7)	14 (11.7)	28 (23.3)	
	Self-employed	14 (11.7)	4 (3.3)	18 (15.0)	
	Other	7 (5.8)	5 (4.2)	12 (10.0)	
Type of query	SUS	41 (34.2)	53 (44.2)	94 (78.3)	0.021*
	Other health plans	18 (15.0)	8 (6.7)	26 (21.7)	
Total		59 (49.2)	61 (50.8)	120 (100)	

Chi-square test; *significant for p<0.05.

Table 2. Resilience of patients with rheumatoid arthritis according to clinical and laboratory characteristics - Medical specialties clinic in the municipality of Ijuí - April/2019 to October/2019, n = 120, Ijuí, RS, Brazil, 2019.

Clinical features		Resilience			
		≥ 147	< 147	Total	p-value
Disease-related variables					
Symptoms duration	Up to 5 years	30 (25.0)	30 (25.0)	60 (50.0)	0.855
	More than 5 years	29 (24.2)	31 (25.8)	60 (50.0)	
Time after diagnosis	Up to 5 years	38 (31.7)	38 (31.7)	76 (63.3)	0.810
	More than 5 years	21 (17.5)	23 (19.2)	44 (36.7)	
Comorbidities	Yes	30 (25.0)	37 (30.8)	67 (55.8)	0.279
	No	29 (24.2)	24 (20.0)	53 (44.2)	
Pain-related variables					
Painful joints	Yes	14 (11.7)	30 (25.0)	44 (36.7)	0.004*
	No	45 (37.5)	31 (25.8)	76 (63.3)	
Swollen joints	Yes	8 (6.7)	15 (12.5)	23 (19.2)	0.125
	No	51 (42.5)	46 (38.3)	97 (80.8)	
HAQ	Mild	40 (33.6)	21 (17.5)	61 (50.8)	<0.001*
	Moderate	15 (12.6)	23 (19.2)	38 (31.7)	
	Severe	4 (3.3)	17 (14.2)	21 (17.5)	
VAS	Painless/Mild	26 (21.7)	14 (11.7)	40 (33.3)	0.014*
	Moderate/intense pain	33 (27.5)	47 (39.2)	80 (66.7)	
DAS 28	Remission	44 (36.7)	35 (29.2)	79 (65.8)	0.220
	Mild	5 (4.2)	6 (5.0)	11 (9.2)	
	Moderate	7 (5.8)	14 (11.7)	21 (17.5)	
	Severe	3 (2.5)	6 (5.0)	9 (7.5)	
Laboratory data					
CRP	Reactive	10 (8.3)	8 (6.7)	18 (15.0)	0.556
	Non-reactive	49 (40.8)	53 (44.2)	102 (85.0)	
Rheumatoid factor	Positive	23 (19.2)	24 (20.0)	47 (39.2)	0.968
	Negative	36 (30.0)	37 (30.8)	73 (60.8)	
Anti-CCP	Positive	16 (13.3)	23 (19.2)	39 (32.5)	0.216
	Negative	43 (35.8)	38 (31.7)	81 (67.5)	
Total		59 (49.2)	61 (50.8)	120 (100)	

Chi-square test; *significant for p<0.05. HAQ = Health Assessment Questionnaire; VAS = Visual Analog Scale; DAS 28 = Disease Activity Score; anti-CCP = anti-cyclic citrullinated peptide; CRP = C-reactive protein.

Table 3. Descriptive measures of patients' resilience with rheumatoid arthritis according to DAS 28, HAQ and VAS - Medical specialties clinic in the municipality of Ijuí - April/2019 to October/2019, n = 120, Ijuí, RS, Brazil, 2019.

Clinical parameters		Resilience					
		n	LL	UL	Mean	SD	CV
HAQ	Mild	61	116	175	148.90a	13.24	0.000*
	Moderate	38	104	169	142.00a	14.51	
	Severe	21	89	156	130.95b	18.13	
VAS	Painless	14	129	171	151.43	11.47	0.110
	Mild	26	116	169	146.46	13.85	
	Moderate	31	89	163	140.81	14.54	
	Severe	49	96	175	141.55	18.08	
DAS 28	Remission	79	89	175	144.56	16.51	0.679
	Mild	11	110	169	143.73	20.75	
	Moderate	21	120	161	142.14	11.28	
	Severe	9	118	162	138.11	13.90	
Total		120	89	175	143.57	15.89	

*ANOVA p<0.05 statistically significant; means followed by the same letter do not differ statistically by Tukey's test with 5% probability. n = number of patients; LL = lower limit; UL = upper limit; SD = standard deviation; CV = coefficient of variation; HAQ = Health Assessment Questionnaire; VAS = Visual Analog Scale; DAS 28 = Disease Activity Score.

Table 4. Resilience of patients with rheumatoid arthritis according to therapeutic characteristics - Medical specialties clinic in the municipality of Ijuí - April/2019 to October/2019, n = 120, Ijuí, RS, Brazil, 2019.

Therapeutic features		Resilience			
		≥ 147	< 147	Total	p-value
Number of drugs	5 or less	32 (26.7)	31 (25.8)	63 (52.5)	0.708[&]
	More than 5	27 (22.5)	30 (25.0)	57 (47.5)	
Use of antidepressants			18 (15.0)	28 (23.3)	46 (38.3)
Type of treatment					
DEMARDcs	Methotrexate	36 (30.0)	35 (29.2)	71 (59.2)	0.685[&]
	Leflunomide	8 (6.7)	6 (5.0)	14 (11.7)	0.525[&]
	Hydroxychloroquine	1(0.8)	5 (4.2)	6 (5.0)	0.111[#]
	Combination therapy	14 (11.7)	15 (12.5)	29 (24.2)	0.912[&]
DEMARDbio		9 (7.5)	11 (9.1)	20 (16.7)	0.683[&]

[#]Fisher's Exact test; [&]Chi-square test; *significant for p<0.05. DEMARDcs = Disease-modifying antirheumatic drugs – conventional synthetics; DEMARDbio = Disease-modifying antirheumatic drugs – immunobiological.

DISCUSSION

In this study, 49.2% of patients with RA had a high level of resilience, and this was assessed as a positive aspect, indicating better coping with the disease, in line with another study[17]. Bearing in mind that RA requires continuous treatment, which causes changes in patients' physical and psychosocial health, the need to measure resilience as an important indicator of patient prognosis is reinforced. This assessment could be included as a routine part of patients' follow-up appointments.

Another finding in this study that corroborates the literature is that chronic diseases affect both the physical and psychological condition of patients[18,19]. On the other hand, when comparing levels of resilience in individuals with RA and healthy controls, no differences were found between the groups[20], which suggests that resilience is not influenced by the disease and possibly represents a personal characteristic.

On the other hand, the resilience of the participants differed in relation to the clinical variables of the disease, such as functional capacity, presence of painful joints and pain intensity, which showed that more resilient individuals had mild disability as measured by HAQ, absence of joint pain on physical examination and lower pain intensity as assessed by the VAS. These results represent an important finding of this research, as they infer that a high level of resilience can have a positive impact on the symptoms of the disease or that those who have fewer symptoms of the diseases are more resilient. In this context, researchers[21] evaluated the association of resilience as a moderator of fatigue in patients with RA and found that less resilient patients had more symptoms of fatigue, in line with the results of this study, in which the influence of resilience on the control of symptoms associated with RA was demonstrated.

As for assessing the functional capacity of patients with RA, the fact that this capacity was associated with high resilience corroborates another study[22], given the characteristics of the disease, which gradually lead to joint impairment and functional reduction, both due to pain and the related motor sequelae. In addition, a lower affective regulatory capacity influences functional impairment[23], an important fact since the condition of the disease itself has an impact on emotional conditions. It is therefore considered that preserving the functional capacity of patients with RA is one of the aims of treatment, with a positive impact on their QoL.

In this study, the patients' pain was assessed objectively in the painful joints and subjectively by the VAS, both of which showed a significant association with resilience. In this sense, joint pain, reported during palpation, showed a significant relationship with the presence of swollen joints. More than half of the participants (52%) reported pain on physical examination and had no swollen joints on joint palpation. Therefore, there is a dissociation between the pain perceived by the patient and the pain related to the presence of joint inflammation. This experience of the researcher, combined with the clinical assessment of the participants in this study, is in line with other investigations into patients with chronic pain[24].

In addition to the inflammatory and subjective pain assessed in this study, some evidence suggests that expanding the search for psychosocial and emotional causes that prevent satisfactory pain control may be important, including to diversify treatment modalities beyond pharmacological[25]. Thus, it was found that pain in RA is not exclusively related to the inflammatory process caused by the disease, but includes subjective aspects that have repercussions on the intensity, control and coping with the disease.

The present study did not show significant association between control of disease activity and resilience. However, it was found that patients with the disease in remission scored higher on the resilience scale, and the elements that make up DAS 28, when assessed individually, such as the number of painful joints and VAS, showed a significant association with resilience. There are no similar studies in the literature that have investigated this association, which is what sets this study apart.

As for the length of time since the disease was diagnosed, this study did not identify a significant relationship with resilience, as was found in another study[26]. On the other hand, a study of young patients with lupus[27] showed that as the disease progressed, patients became less resilient, which was explained by the

greater perception of the physical and social limitations caused by the disease.

About sociodemographic characteristics, there was a predominance of females, in line with a study on patients with RA[28]. There was no association between resilience and gender, diverging from another research[20].

Regarding sociodemographic variables, it was found that the majority of patients had low levels of schooling and low socioeconomic status, which were associated with lower levels of resilience, in line with one study[29] and differing from another study[30]. In addition, it was found that RA patients who did domestic work were less resilient. Other results which were statistically significant, and which may justify the low resilience of patients who work in this activity is the fact that they have a low income and less schooling when compared to the rest of the study group.

Regarding marital status, most of the participants lived with a partner, but the highest resilience scores were in the group without partners. One study investigated resilience in a population with chronic illness and found no association between resilience and marital status[31]. One justification for the study in question may be related to the fact that the group living without a partner had less functional disability, as assessed by HAQ.

The results of this study on the smoking variable showed that the majority of RA patients do not smoke, in line with another study on RA patients[32]. In addition, it was found that patients with no history of smoking had a higher level of resilience, with statistical significance. This result may explain why patients who smoke are less resilient, considering the relationship between emotional and psychological symptoms and resilience[33].

The vast majority of participants accessed the clinic via SUS, but it was found that RA patients with supplementary health insurance were more resilient.

In line with the objectives proposed in the present study, the importance of promoting resilience in RA patients in clinical practice is highlighted, with the aim of contributing to the disease management, in view of the results found here and those of other studies mentioned, in which the high resilience of RA patients is a positive factor that can contribute to better coping and symptoms' control.

One of the main limitations of this study was the sample smaller than defined by the sample calculation. This limits the statistical power of the analysis. In order to generalize the data, it would be necessary to expand the study population to other public and private care facilities. Another limitation to be mentioned is the cross-sectional design due to the information bias with one-off data collection.

CONCLUSION

This study made it possible to assess the resilience of patients with RA and relate it to the clinical outcome of the disease, specifically pain, functional capacity and disease activity. This study provided support to qualify professional practice and care for this population. It is considered that the care of patients with RA should aim far beyond pain reduction, and that as soon as additional measures are adopted, such as educational actions and behavioral strategies, with an emphasis on resilience, which help in the control and clinical outcome of the disease, there will certainly be a positive impact on the QoL of these patients.

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