



## Correlation between quality of life and functional capacity in patients with multiple sclerosis

### *Correlação entre a qualidade de vida e a capacidade funcional em pacientes com esclerose múltipla*

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#### ABSTRACT

Multiple sclerosis (MS) is a chronic inflammatory and demyelinating disease of the central nervous system, leading to functional and social disabilities and worsening of the quality of life of these individuals. The aim of this study was to verify the quality of life and degree of functional impairment of MS patients. This is a cross-sectional and descriptive study. The World Health Organization Quality of Life (WHOQOL - BREF) was used to evaluate quality of life and the Expanded Disability Status Scale (EDSS) for the evaluation of disabilities. Thirty four individuals with MS were evaluated, with a mean age of 41.14 years, predominantly female (61.76%). Of this sample, 76.47% had recurrent and recurrent clinical forms and 17.65% had a secondary progressive form; the mean EDSS was 2.95. It is concluded that in this group studied there are points of correlation between quality of life and the incapacities resulting from the disease.

**Keywords:** Disability. Multiple sclerosis. Quality of life.

#### RESUMO

A esclerose múltipla (EM) é uma doença crônica inflamatória e desmielinizante do sistema nervoso central, levando a incapacidades funcionais e sociais e piora da qualidade de vida dos indivíduos. O objetivo deste trabalho foi verificar a correlação entre a qualidade de vida e o grau de acometimento funcional de paciente com EM. Trata-se de um estudo do tipo transversal, descritivo e quantitativo. Foi utilizado a *The World Health Organization Quality of Life* (WHOQOL - BREF) para avaliação da qualidade de vida, e a *Expanded Disability Status Scale* (EDSS) para avaliação das incapacidades. Foram analisados 34 indivíduos com EM, com média de idade de 41,14 anos e com predomínio do gênero feminino (61,76%). Dessa amostra, 76,47% apresentaram a forma clínica remittente-recorrente, e a média da EDSS foi de 2,95, com pontos de correlação estatisticamente significante entre EDSS e WHOQOL-BREF. Conclui-se que nesse grupo estudado existem pontos de correlação entre a qualidade de vida e as incapacidades decorrentes da doença.

**Palavras-chave:** Esclerose múltipla. Incapacidades. Qualidade de vida.

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## INTRODUCTION

Multiple sclerosis (MS) is a generally progressive, inflammatory and demyelinating in the white matter of the central nervous system (CNS) disease, resulting in various neurological signs and symptoms<sup>1</sup>. It is a disease of unknown etiology, related to biological and environmental factors<sup>2</sup>, which affects young adults, mainly in the age group from 15 to 45 years, with a higher incidence at 30 years of age<sup>3</sup>, mostly Caucasian women. It causes several neurological manifestations, such as muscle weakness, paraparesis, paraesthesia, visual disturbances, tremor, ataxia and bladder dysfunction<sup>4,9</sup>. Among these symptoms, fatigue is particularly common and can occur in up to 90% of patients with MS, which makes everyday activities difficult<sup>10</sup>.

In Brazil, the prevalence of MS is 15/100,000 inhabitants, with a higher incidence in women<sup>11</sup>. In Uberaba (MG) the prevalence is 12.5/100,000 inhabitants, with the female gender being twice as affected compared to the male one<sup>12</sup>. MS has an extremely variable and unpredictable evolution, with five courses of the disease being described: Benign MS (BMS), Malignant MS (MMS), Secondary Progressive MS (SPMS), Primary Progressive MS (PPMS) and the most common, the Relapsing-remitting MS (RRMS)<sup>13</sup>.

Due to the fact that MS is a chronic and progressive disease over the years, symptoms that lead to loss of function accumulate, leading to functional and social disabilities, the consequence of these symptoms substantially affect the quality of life of patients<sup>4,14</sup>. According to the World Health Organization (WHO) quality of life is defined as people's perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns<sup>15</sup>.

Thus, this study is justified to elucidate that the quality of life of patients with MS is associated with the disabilities that the disease predisposes patients to. Therefore, this study hypothesized the existence of a positive correlation between quality of life assessed by WHOQOL - BREF and the disabilities resulting from the disease. The general objective was

to verify the correlation between the quality of life and the degree of functional impairment of patients with MS, through the association of two scales.

## METHODOLOGY

Cross-sectional, descriptive and quantitative study. The research was approved by the Research Ethics Committee under number: 948,994. Thirty-four individuals with MS from the Specialty Clinic Maria da Glória of Universidade Federal do Triângulo Mineiro in the city of Uberaba participated in the study, with a mean age of 41.14 (standard deviation  $\pm$  13.31). For the application of the tests, the evaluator participated in a training to standardize the evaluation instruments, to be eligible and reduce the risk of errors.

Inclusion criteria were: patients with a clinical diagnosis of MS and registered at the Ambulatory of specialties. The exclusion criteria were: patients with other associated disabling diseases and not attending data collection; refuse to participate in the research; or who have not completed a diagnosis of MS. All participants signed a Free and Informed Consent Form.

The following assessment instruments were used: The World Health Organization Quality of Life (WHOQOL - BREF) and Expanded Disability Status Scale (EDSS). The WHOQOL - BREF is a questionnaire for assessing quality of life, which consists of 26 questions, two general ones concerning quality of life, and the others separated into four domains (Physical, Psychological, Social Relations and Environment)<sup>16</sup>. EDSS is a scale that evaluates the disabilities that occurred during the evolution of MS, and quantifies the disabilities in eight functional systems: pyramidal functions, cerebellar functions, brainstem functions, sensory functions, bladder functions, intestine functions, visual functions, and mental functions. It has twenty items, with a greater focus on walking capacity, with a score from 0 to 10, where 0 has no disability and 10 is death due to illness<sup>17</sup>.

Statistical data analysis was performed using the SPSS program (SPSS for Windows - Version 11.0 - SPSS inc.). The normality of the data was verified

using the Shapiro-Wilk test. The normality test had a non-normal distribution, so the Mann-Whitney test was used, and Spearman's test was used for correlation. Differences in which the probability was less than 5% were considered statistically significant,  $p < 0.05$ .

**RESULTS**

Thirty-four individuals were evaluated, according to the inclusion and exclusion criteria, with none being excluded. The mean age was 41.14 years with a standard deviation of 13.31, with a predominance of females (61.76%, and 38.24%, males), corresponding to 21 and 13 people, respectively. The most frequent form of clinical evolution was RRMS, with 26 cases (76.47%), followed by SPMS with six cases (17.65%) and PPMS with two cases (5.88%). The mean time of diagnosis was 9.06 months, and the mean EDSS was 2.95 (Table 1).

**Table 1.** Sample characteristics

Variables	n (34)	% (100,00)
<b>Gender</b>		
Male	13	38,24
Female	21	61,76
<b>Multiple sclerosis classification</b>		
Relapsing-Remitting (RRMS)	26	76,47
Primary Progressive (PPMS)	2	5,88
Secondary Progressive (SPMS)	6	17,65
	Average	standard deviation
Age (years)	41,14	13,31
Diagnostic time(months)	9,06	5,40

Source:research data

There was a positive and significant correlation between the WHOQOL– BREF quality of life scale and the EDSS functionality scale on some of the questions assessed (Table 02). For question three, which assessed how much (physical) pain prevented the individual from doing what he/she needed, a correlation

with statistical significance,  $p < 0.02$  was obtained. Question five, measuring how much the individual enjoyed life, and question number 10, which analyzed the degree of energy sufficient for the subject's daily life, also obtained statistical significance,  $p < 0.004$ . Question nine, assessed how healthy the individual's physical environment was (weather, noise, pollution, attractions),  $p < 0.006$ , and question 15,  $p < 0.0001$ , which measured how well the subject could walk.

**Table 2.** Correlation between WHOQOL and EDSS

	r	p
Question 1	-0,3857	0,0243
Question 2	-0,3857	0,0231
Question 3	0,4287	0,0114*
Question 4	0,4058	0,0172
Question 5	-0,4833	0,0038*
Question 6	-0,3809	0,0263
Question 7	-0,3809	0,0263
Question 8	-0,02290	0,8977
Question 9	-0,4629	0,0058*
Question 10	-0,4834	0,0038*
Question 11	-0,2195	0,2122
Question 12	-0,1672	0,3445
Question 13	-0,1831	0,2999
Question 14	-0,2800	0,1088
Question 15	-0,7818	0,0001*
Question 16	-0,05844	0,7427
Question 17	-0,3713	0,0306
Question 18	-0,4614	0,0117
Question 19	-0,4748	0,0045
Question 20	-0,04800	0,7875
Question 21	-0,3807	0,0263
Question 22	-0,1745	0,3236
Question 23	0,2047	0,2455
Question 24	0,002436	0,9891
Question 25	0,1776	0,3150
Question 26	0,06200	0,7276

Spearman correlation analysis and p-value between the mean value of each facet of WHOQOL– BREF, with the average total value of the EDSS. \* Significant for  $p < 0.05$ .

Source:research data

## DISCUSSION

The main objective of the study was to verify the correlation between quality of life and the degree of functional impairment of patients with MS. Our hypothesis that there would be a correlation between quality of life assessed by WHOQOL - BREF and the disabilities resulting from the disease, assessed by EDSS, was validated. The most frequent form of clinical evolution is RRMS<sup>13,18</sup>. Corroborating this study, 76.47% (26 individuals) of the cases were of RRMS, followed by 17.65% (6 individuals) with SPMS and 5.88% (2 individuals) with PPMS.

Our sample had an average EDSS of 2.95, qualifying the individual with full walking capacity without the need for physical support, and moderate disability in one functional system or mild disability in three or four functional systems may occur. This findings point out that the sample had a lower degree of severity in relation to other studies that obtained an average of 4.34 and 4.1<sup>19, 20</sup>. It is inferred that the result of the present study may have presented a lower average, compared with the literature findings, according to the average time of diagnosis of the patients included in this research, which was approximately nine months.

The impact of the disease can vary according to the type of MS, from individual to individual, as a consequence such disease can substantially affect quality of life<sup>4</sup>. This study showed that there is a correlation between quality of life and the disabilities resulting from MS, mainly in the physical domain, results also found in studies in the researched literature<sup>19,21</sup>. Descriptions comparing two groups were observed, with 29 individuals - one with RRMS and the other, healthy - it was described that participants with MS reported more pain and worse quality of life than the participants in the control group, what is more, the severity of pain was significantly associated with lower scores on the quality of life scales<sup>22</sup>.

Fatigue is a frequent symptom in MS, having a great impact on patients' lives, which can negatively interfere with motivation and concentration, everyday activities, family relationships, and social life<sup>10,23</sup>. Data

that corroborate our results, measuring the relationship between decreased quality of life and the level of energy needed for the daily lives of patients included in the study.

The lower ability to walk leads to greater pain severity and less physical quality of life<sup>22</sup>. Moreover, it results in postural instability and gait abnormalities associated with accidental falls, which suggests a lower quality of life in relation to physical health<sup>10,24</sup>. Quality of life, the physical and mental health composite decreased due to the state of locomotion, and patients with higher values in the EDSS have a worse quality of life related to physical and mental health<sup>25</sup>, according to the findings of the current study.

In five years, it was found that the increase in disabilities and the loss of quality of life were more accentuated in the group with low disease severity (EDSS 0 to <4.5) than in the group with the most serious disease (EDSS 7 to <10)<sup>26</sup>. The same result was found in another study, in which patients in a wheelchair, with higher EDSS values, do not have further reductions in quality of life compared to patients with lower EDSS values<sup>25</sup>. The increase in disabilities and the loss of quality of life occurs in the early stages of MS<sup>10,24</sup>. Patients who had lower EDSS values had a better quality of life compared to patients with higher EDSS values<sup>27</sup>, the same results were found in this study.

There are two distinct influences on the quality of life in MS, namely: the physical-motor and cognitive-emotional components<sup>28</sup>. Depression is a factor that significantly affects quality of life, and is related to the duration of the disease and higher EDSS values<sup>27</sup>; similar results in another study that correlated younger patients with shorter duration of the disease, with less disabilities, lower depression rates obtained better scores in the assessment of quality of life<sup>21</sup>.

Depression and stress affect quality of life, and the presence of depression in patients with MS hinders the ability to self-care<sup>29</sup>. In this study, a significant correlation between the domains of the WHOQOL-BREF scale in relation to negative feelings, such as depression and EDSS, was not found, due to the fact that this scale does not have points that prioritize the assessment of cognitive-emotional state. However, we believe that there is a relationship between these

variables. Thus, we suggest that further studies include the investigation of these parameters.

## LIMITATIONS

This study benefits from a large sample size and broad and validated representativeness, both for the population of the city of Uberaba (MG) and the Brazilian one with MS; therefore, the generalization of these results can be expressed in other cities and/or countries. The comprehensive measure of multiple clinical studies and quality of life factors gives us a great capacity to control relevant variables in order to assess the independence of the evaluated associations.

A limitation of the present analysis is the attribution of the study to patients in only one city. There is probably bi-directionality and more prospective or randomized cutting, further studies are needed to assess the causal direction of these associations, given that retrospective measures of style and modifiable quality of life depending on the environment and socio-economic condition, factors that were not included as part of the current study.

## CLINICAL RELEVANCE

In clinical practice, the use of tests for the analysis of quality of life by WHOQOL - BREF and the disabilities resulting from MS, allows us to discriminate that the quality of life, in addition to other factors, can be correlated to the physical domains and the ability to walk. Thus, we emphasize the importance of encouraging treatments that seek to improve or delay the physical progression of MS, giving the opportunity for a life closer to normality.

## CONCLUSION

With these results, it is possible to conclude that in this studied group there are points of correlation between quality of life assessed by WHOQOL - BREF and the disabilities resulting from the disease, mainly those related to the physical domain and abil-

ity to walk, assessed by the EDSS. In these individuals, the EDSS could be a predictor of the level of quality of life.

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