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Quality of life after hospitalization for COVID-19: an analysis with the WHOQOL-BREF

Qualidade de vida após hospitalização por COVID-19: uma análise com o WHOQOL-BREF

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ABSTRACT

Objective: To analyze quality of life (QoL) and associated factors in individuals after hospitalization due to COVID-19. **Method:** Cross-sectional study of patients hospitalized for COVID-19. The WHOQOL-BREF instrument was used for QOL analysis. A multiple linear regression model was used to evaluate the QOL of the stakeholders. **Results:** The highest mean QOL was observed in the social relationships domain (14.97 ± 3.43), followed by the psychological (14.53 ± 2.07), environmental (14.20 ± 2.49) and physical domains (12.75 ± 2.10). For each additional year of age, there was an increase of 0.44 points in the physical domain, 0.06 in the social relationship domain and 0.49 in the environmental domain. Individuals earning up to 2 times the minimum wage had a reduction of 1.60 points in the environmental domain; retired or a pensioner had a reduction of 1.84 points in the physical domain score, 1.40 in the psychological domain score and 2.62 in the social domain score in the ICU had a negative impact of 1.52 points on the scores in the social relationship domain. **Conclusions:** After hospitalization for COVID-19, individuals presented a good perception of their QOL. Demographic, social and clinical aspects influenced the perception of QOL, which indicates the need for the adoption and implementation of public policies aimed at minimizing these differences.

Keywords: quality of life; hospitalization; COVID-19; public health.

RESUMO

Objetivo: analisar a Qualidade de Vida (QV) e seus fatores associados em indivíduos após hospitalização por COVID-19. **Método:** estudo transversal com hospitalizados por COVID-19. Foi utilizado o instrumento WHOQOL-BREF para a análise da QV. Um modelo de regressão linear múltipla foi usado para determinar os intervenientes na QV. **Resultados:** a maior média de QV foi observada no domínio relações sociais (14,97 ± 3,43), seguida dos domínios psicológico (14,53 ± 2,07), meio ambiente (14,20 ± 2,49) e físico (12,75 ± 2,10). A cada um ano de idade acrescido, aumenta 0,44 pontos no domínio físico, 0,06 em relações sociais e 0,49 no meio ambiente. Indivíduos com até dois salários mínimos apresentaram redução de 1,60 pontos no domínio meio ambiente; ser aposentado ou pensionista reduziu 1,84 pontos nos escores no domínio físico, 1,40 no psicológico e 2,62 nas relações sociais; não necessitar de internação em UTI impactou negativamente 1,52 pontos nos escores no domínio relações sociais. **Conclusões:** os indivíduos, após hospitalização por COVID-19, apresentaram uma boa percepção de sua QV. Aspectos demográficos, sociais e clínicos influenciaram na percepção de QV, o que indica a necessidade de adoção e implementação de políticas públicas que visem minimizar essas diferenças.

Palavras-Chave: qualidade de vida; hospitalização; COVID-19; saúde pública.

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INTRODUCTION

Individuals who have recovered from COVID-19 may have persistent symptoms that persist for months after acute infection.[1] These complications include musculoskeletal, respiratory, cardiovascular, renal, hepatic, gastrointestinal and neurological disorders. Psychiatric diseases such as anxiety and depression have also been reported.[2,3] Post-COVID-19 changes affect both the health status and quality of life (QOL) of individuals.[4,5]

According to the World Health Organization (WHO),[6] QOL is defined as "an individual's perception of their position in life, in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". In this sense, to evaluate QOL, one should start with instruments developed with this approach that consider emotions and feelings and evaluate the individual in the context of their expectations and achievements.[7]

In general, diseases that require hospitalization have a negative impact on QOL, especially in the physical and mental dimensions.[8] The impairment of QOL in individuals with a history of hospitalization for the treatment of COVID-19 is influenced by baseline clinical conditions; the duration of mechanical ventilation; and factors that impair the ability to perform activities of daily living, such as health complications involving mental, social and physical functions.[5,9,10]

Currently, there is a large population that has recovered from COVID-19, and some of them are still living with the long-term effects of the disease. In this sense, it is important to understand the issues related to the QOL of individuals who have recovered from COVID-19. Their knowledge will provide a more comprehensive view of post-COVID-19 health from a biopsychosocial perspective. This understanding may guide clinical conduct and provide information that will contribute to the proposition of public policies aimed at the care and health care of this population. The objective of study was to analyzer the QOL of individuals after hospitalization for COVID-19 and to identify the associated factors.

METHODOLOGY

This was a cross-sectional study with a quantitative approach. The study was conducted in the municipality of Rondonópolis, located in the southeastern region of the state of Mato Grosso. The target population of the study was individuals admitted to a municipal reference hospital for COVID-19 in Rondonópolis, MT, from June to December 2021. Only residents of the municipality are hospitalized at the institution.

As eligibility criteria, participants aged 18 years or older with SARS-CoV-2 infection confirmed by RT-PCR and/or rapid antigen detection test and with the telephone number available in the registry were included in the study of hospitalization. We excluded patients who died; were not diagnosed by telephone contact after 5 attempts on different days and at different times; had severe aphasia, hearing loss, or other health problems that made it impossible to answer the questionnaire; or refused or withdrew consent for participation.

The participants were selected through an active search in the IndicaSUS System of the State Department of Mato Grosso. Initially, individuals who met the eligibility criteria were contacted by telephone. The study's objectives, risks and benefits were explained. In case of acceptance, the date and time for data collection were scheduled.

Data were collected from June to December 2022 by video calling through a cross-platform instant messaging application. The semistructured questionnaire was divided into blocks with sociodemographic and clinical questions in the acute phase of the disease and clinical questions after COVID-19. All the information was self-reported by the study participants. The instrument was previously tested and adjusted in a pilot study with individuals not included in the study.

For the analysis of QOL, the WHOQOL-BREF was used. This tool has been validated by the WHO, which has 26 questions, two of which refer to QOL in general the others represent each of the 24 facets that make up the original instrument. The health status was divided into four domains: physical, social relationships, and environment.[11]

The dependent variable of the study was the QOL score for the four domains, where three sets of variables were evaluated as factors potentially associated with QOL: Sociodemographic variables, Clinicians in the acute phase of COVID-19 and Post-COVID-19 clinicians.

The data obtained from the WHOQOL-BREF were initially analyzed in Excel, as described by Pedroso *et al*.[12] The calculation of QOL scores was obtained separately for each of the four domains. The raw score was transformed into a range of 4 to 20 points. Thus, the minimum possible score for each domain is 4, and the maximum is 20; thus, the higher the score is, the greater the perceived QOL.[12]

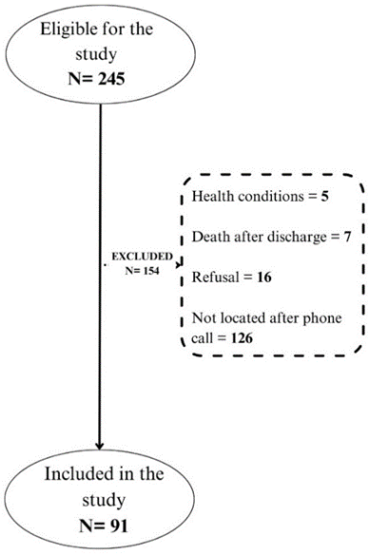
Initially, descriptive analysis of the data was performed using simple frequency for the nominal variables and central tendency (mean) and dispensation (standard deviation) for the numerical variables of each domain of QOL. A t test was used to analyze the associations between the explanatory variables and the QOL domains. A multiple linear regression model was used to analyze the degree of impact of the independent variables on the dependent variables. The significance level adopted was $p < 0.05$. For the statistical analyses, the programs JASP 0.16.3.0 and *Statistical Package for Social Science* (SPSS) 26.0 *for Windows* were used.

The study was approved by the Research Ethics Committee of the Júlio Muller University Hospital number: 4,418,798. All ethical principles for researching human beings were followed, according to Resolution 466 of December 12, 2012, of the National Health Council of the Ministry of Health. The individuals were informed about the objectives of the study, the confidentiality of the information and the refusal to provide informed consent were replaced by verbal consent, after which a copy of the Free Informed Consent Form was sent to each participant through the multiplatform instant messaging application.

RESULTS

Figure 1 shows the process of selecting eligible participants for the study. The sample consisted of 245 individuals who were discharged from the hospital due to COVID-19 during the study period. Of these, 5 had health conditions that made it impossible to answer the questionnaire, 7 died after hospital discharge, 16 refused to participate and 126 were not diagnosed by telephone after 5 attempts on different days and times, for a total of 91 study participants.

Figure 1. Flowchart of the sample selection process for eligible participants in the study.

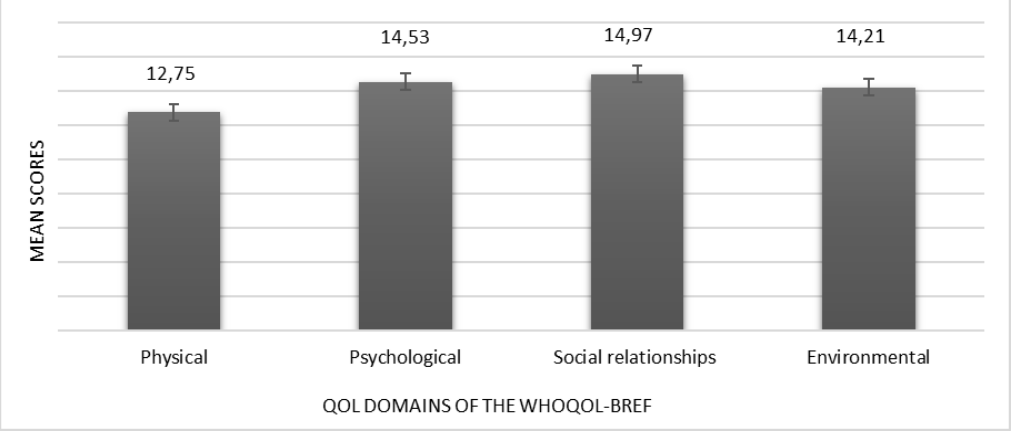


Source: The author (2023).

The mean age (in years) of the study participants was 47.83 ± 14.63 years, with a minimum of 22 and a maximum of 95 years. Regarding the sociodemographic characteristics of the population, there was a predominance of females (51.6%; n = 47). Individuals aged 40 - 59 years (50.5%; n = 46), white (74.7%; n = 68), reported not having a higher education (71.4%; n = 65), had an income of up to 2 times the minimum wage (54.9%; n = 50), lived with a partner (62.6%; n = 57) and were in the labor market (63.7%; n = 58).

Figure 2 shows the mean scores of the QOL domains of the WHOQOL-BREF in the study population. The highest average was observed in the social relationship domain (14.97 ± 3.43), followed by the psychological (14.53 ± 2.07), environmental (14.20 ± 2.49) and physical (12.75 ± 2.10) domains.

Figure 2. Mean values of the QOL domain scores of the WHOQOL-BREF for individuals who were discharged from the hospital due to COVID-19. Rondonópolis, MT, 2022.



Source: Author 2023.

The univariate analysis of the mean QOL scores for the WHOQOL-BREF domains according to the clinical characteristics of the acute and post-COVID-19 phases is described in Table 1.

A significant difference was observed for the variable comorbidity in the psychological domain (p = 0.028), in which individuals who reported comorbidities in the acute phase of the disease had a lower mean.

Study participants who used medication continuously before hospitalization for COVID-19 had lower means of QOL in the physical (p = 0.049) and psychological (p = 0.007) domains, and participants who reported hospitalization in the ICU had lower scores in the physical domain (p = 0.039).

Regarding clinical characteristics after COVID-19, participants who sought health care after hospital discharge had a lower mean score in the physical domain (p = 0.039), and those who reported developing some comorbidity after COVID-19 had a lower mean score in the physical (p = 0.002) and psychological (p = 0.013) domains.

Table 1. Distribution of mean QOL scores in each WHOQOL-BREF domain of individuals after hospital discharge due to COVID-19 according to the clinical characteristics of the acute and post-COVID-19 phases. Rondonópolis, MT, 2022. N = 91.

Variables	Mean (SD) of WHOQOL-BREF Scores *			
	Physical	Psychological	Social Relations	Middle Environment
Acute Phase				
Comorbidity				
Yes	12,45 (2,31)	14,09 (2,28)	14,77 (3,89)	14,02 (2,76)
No	13,08 (1,81)	15,04 (1,68)	15,20 (2,84)	14,42 (2,15)
Value p	0,154	0,028	0,554	0,440
Use of continuous medications				
Yes	12,25 (2,30)	13,88 (2,32)	14,50 (3,51)	13,68 (2,73)
No	13,13 (1,88)	15,04 (1,71)	15,34 (3,36)	14,61 (2,23)
Value p	0,049	0,007	0,246	0,078
Ventilatory support				
Yes	12,71 (2,32)	14,58 (2,23)	15,25 (3,57)	14,31 (2,84)
No	12,84 (1,43)	14,40 (1,61)	14,24 (2,97)	13,94 (1,17)
Value p	0,786	0,706	0,212	0,530

Continua

Variables	Mean (SD) of WHOQOL-BREF Scores *			
	Physical	Psychological	Social Relations	Middle Environment
ICU admission				
Yes	12,95 (2,35)	14,72 (2,18)	15,61 (3,33)	14,13 (2,67)
No	12,54 (1,84)	14,34 (1,97)	14,34 (3,45)	14,28 (2,33)
Value p	0,039	0,098	0,809	0,127
Pós-COVID-19				
Seek health care				
Yes	12,38 (2,23)	14,25 (2,08)	14,90 (3,27)	13,89 (2,56)
No	13,322 (1,77)	14,99 (2,00)	15,08 (3,72)	14,71 (2,33)
Value p	0,039	0,098	0,809	0,127
Specialized home treatment				
Yes	12,95 (2,37)	14,94 (2,28)	15,35 (3,67)	14,24 (3,20)
No	12,63 (1,96)	14,32 (1,95)	14,77 (3,32)	14,19 (2,06)
Value p	0,495	0,176	0,451	0,928
Comorbidity				
Yes	11,866 (2,15)	13,84 (2,15)	14,54 (3,66)	13,64 (2,69)
No	13,27 (1,91)	14,94 (1,93)	15,22 (3,30)	14,54 (2,32)
Value p	0,002	0,013	0,365	0,097
Use of continuous medications				
Yes	12,10 (2,07)	13,88 (2,05)	15,68 (3,60)	13,61 (2,42)
No	12,89 (2,10)	14,68 (2,06)	14,81 (3,40)	14,345 (2,50)
Value p	0,162	0,152	0,346	0,281

*Scale between 4 and 20; SD: standard deviation.

The results of the multivariate regression are shown in Table 2. After the adjusted analysis, the only variables that remained associated with QOL were age in the physical domain, social relationships and environment, family income in the environmental domain, work situation in the physical domain, psychological and social relationships and ICU admission in the social relationship domain.

For each additional year of age, the QOL scores increased by 0.44 points in the physical domain, 0.06 in the social relationship domain and 0.49 in the environment domain. Being retired or a pensioner reduced the QOL score by 1.84 points in the physical domain, 1.40 in the psychological domain and 2.62 in the social domain. Individuals with up to 2 times the minimum wage showed a reduction of 1.60 points in the QOL values for the environment domain. Not requiring ICU admission negatively impacted the QOL score by 1.52 points in the social relationship domain.

Table 2. Multivariate analysis of the mean QOL scores in each WHOQOL-BREF domain of individuals after hospital discharge due to COVID-19. Rondonópolis, MT, 2022. N = 91.

Variables	WHOQOL-BREF domains			
	Physical β coefficient (IC 95%)	**Psychological β coefficient (IC 95%)**	**Social Relations β coefficient (IC 95%)**	**Environment β coefficient (IC 95%)**
Genre Women vs. Men	-0,50 (-1,43; 0,43)	-0,30 (-1,24; 0,64)	-1,38 (-2,99; 0,22)	-0,65 (-1,80; 0,50)
Age (years)	0,44* (0,10; 0,78)	0,03 (-0,01; 0,68)	0,06* (0,01; 0,12)	0,49* (0,01; 0,09)
Color Self-reported White vs. Not white	0,19 (-0,79; 1,18)	-0,32 (-1,32; 0,67)	-0,97 (-2,68; 0,72)	-0,26 (-1,48; 0,95)
Education Without higher education vs. With higher education	0,68 (-0,38; 1,74)	1,00 (-0,73; 2,07)	0,91 (-0,92; 2,74)	0,29 (-1,01; 1,60)
Family income in minimum wages Up to 2 vs. > 2	-0,81 (-1,69; 0,06)	-0,14 (-1,02; 0,74)	-1,13 (-2,63; 0,37)	-1,60* (-2,68; -0,52)
Work situation Retired/Pensioner vs. Formal/informal work	-1,84* (-3,28; 0,41)	-1,40* (-2,85; 0,42)	-2,62* (-5,09; -0,16)	-1,46 (-3,22; 0,30)
Work situation Not inserted in the labor market vs. Formal/informal work	-0,07 (-1,23; 1,09)	-0,13 (-1,30; 1,04)	-0,95 (-0,95; 1,05)	0,20 (-1,22; 1,64)
Medications in the acute phase Yes vs. No	0,41 (-0,67; 1,49)	0,79 (-0,30; 1,88)	0,27 (-1,59; 2,13)	0,42 (-0,91; 1,76)
ICU admission No vs. Yes	-0,49 (-1,33; 0,34)	-0,29 (-1,14 0,55)	-1,52* (-2,96; -0,76)	-0,06 (-1,10; 0,96)

Multivariate analysis: *p ≤ 0.05; 95% CI: confidence interval.

DISCUSSION

In this study, we evaluated the QOL of individuals after hospitalization for COVID-19 using the WHOQOL-BREF, a summarized version of the WHOQOL-100. Study participants showed a good perception of QOL, as the mean values of the scores in the physical, psychological, social and environmental domains were slightly above the mean, between 12.75 and 14.97, as the scores ranged from 4 to 20. Similar results were observed in studies of COVID-19 patients recovered from Bangladesh,[13] and France.[14]

In our study, most participants had been hospitalized for more than one year. According to a study conducted by Hawleder *et al.*,[13] Hellemons *et al.*[15] and Ahmed *et al.*,[16] QOL improved each day after the diagnosis of COVID-19. In addition, the study participants were hospitalized during the period of progressive increase in vaccination coverage, in addition to being at the end of the circulation period of the delta variant and beginning of the omic variant of the SARS-CoV-2 virus, which has high transmission power. However, with lower mortality,[17] a factor that may have resulted in a lower impact on the QOL of the study population.

In the present study, the social relationships domain had the highest mean score, while the physical domain had the lowest. Martins *et al.*,[18] conducted a study with hospitalized individuals in the state of Paraná and reported that the physical domain had the lowest score compared to the other domains, while the social relations domain had the best score, followed by the psychological and environmental domains.

The clinical condition of individuals who recovered from COVID-19 may explain the low score in the physical domain. According to Borghi-Silva *et al.*,[19] individuals who recovered from COVID-19, as well as those subjected to prolonged hospital stays, may have various functional limitations, which may

reflect a reduction in the physical aspect of QOL. The physical domain of the WHOQOL-BREF addresses the presence of pain or discomfort, medication dependence, satisfaction with sleep, ability to work and daily activities, among others.[20]

Multivariate analysis revealed that age, income, work status and ICU admission were factors that negatively impacted the QOL of the studied patients who recovered from COVID-19. Other surveys have also shown some determinants of worse QOL in individuals during the post-COVID-19 period.[13] Studies revealed [5,13,21] that female sex, age > 50 years, college degree, unemployment, presence of diabetes, diagnosis of heart failure, smoking history, forced vital capacity number of comorbidities, duration of invasive mechanical ventilation and ICU admission are determinants of negative perceptions of QOL.

We observed that as the age of the study population increased, the QOL scores in the physical domain, social relationships and the environment increased. A similar result was found in previous studies,[22] which could be explained by the fact that older individuals are able to perceive themselves as fulfilled regarding what they want and what they accomplish in their life course.[23,24] Based on these assumptions, we believe that with increasing age, there may be an improvement in the perception of QOL.

A lower income was negatively associated with QOL in the environmental domain. The data of this study corroborate the studies conducted by Maciel *et al.*,[25] who described a relationship between the environmental domain and the income variable, indicating that lower family income resulted in lower scores in this domain.

Regarding work situation, we observed that retirees or pensioners had lower QOL scores in the physical, psychological and social relationships domains than individuals in the labor market. Oliveira *et al.*,[26] also found that being retired was a factor associated with impaired QOL. This reduction can be explained by the fact that the process of retiring generates frustration and feelings of exhaustion, as work is strongly associated with identity, thus leading to deterioration of QOL.[27]

In the social relationship domain, we observed that ICU patients had a better perception of QOL than did those who did not need this type of care individual treatment. After discharge from the ICU, individuals are most often weakened and vulnerable and thus require greater care, which consequently generates greater interaction with their support network. Family support is a source of benefits for individuals because the family represents a unit of solidarity and an incentive for rehabilitation.[28] According to Barros,[29] ICU hospitalizations can be considered a context of individual and family development. This may lead to an improvement in the perception of personal relationships.

Regarding the limitations of this study, the data collection method should be highlighted, as the information was self-reported, a factor that can lead to recall bias. Other limitations were the small population of the study, as there were many refusals by the participants, and many individuals were not located, which negatively impacted the sample size of the study and the assessment of QOL in a single center. Even three years after the beginning of the pandemic, studies on this topic are rare. Therefore, the present study contributes to filling this gap in scientific knowledge and encourages future research to better understand the living conditions of those who have recovered from COVID-19.

CONCLUSION

The social relations domain presented the best perception of QOL in WHOQOL-BREF, while the physical aspects showed the worst scores. An increase in age was associated with a better perception of QOL, while lower income, retirement or pension and not having been admitted to the ICU were associated with a worse perception of QOL.

The data generated show the impact of sociodemographic factors on QOL, which indicates the need for the adoption and implementation of public policies aimed at minimizing these differences, contributing to the promotion of health care in an equitable manner. It is also important that social and health services understand these facts and seek intervention mechanisms or strategies aimed at improving the QOL of those who have recovered from COVID-19.

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