

## Independence in Avd's and quality of life in elderly survivors of covid-19 in the rural area of Coroatá-MA

### Independência em Avd's e qualidade de vida em idosos sobreviventes da covid-19 na zona rural de Coroatá-MA

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**ABSTRACT | INTRODUCTION:** COVID-19 is a disease caused by SARS-CoV-2, belonging to a Coronaviridae family whose viruses infect animals and, with few exceptions, can infect humans. **OBJECTIVE:** To assess the level of dependence in activities of daily living and quality of life in elderly survivors of COVID-19 in the rural area of Coroatá - MA and verify whether there is an association between the level of independence in daily living and quality of life. **METHODOLOGY:** This is a cross-sectional and descriptive study with a quantitative approach, with data collection through a questionnaire applied to the elderly formerly affected by COVID-19 through a questionnaire divided into two sessions, the first session consisting of sociodemographic and economic variables and the second consisting of physical health variables such as the presence of self-reported comorbidities and assessment of Independence in Activities of Daily Living (EIAVD) by the Katz Scale and quality of life by the SF-36. As this is a study with convenience sampling, only elderly people who met at the residence were interviewed. Statistical analysis was performed using Student's t-test to obtain independent samples. Pearson's correlation coefficient was established between the Katz index and the SF-36 questionnaire. **RESULTS:** 20 elderly survivors of COVID-19 participated in the study. Age ranged from 61 to 86 years, with a mean of  $70.45 \pm 8.15$  years. According to the Katz scale, 85% of the elderly were characterized as independent in the six functions (bathing, dressing, using the bathroom, transferring, continence, and feeding), and 15% were independent in 5 functions (bathing, getting dressed, using the toilet, transferring, and feeding). In terms of quality of life, the participants had an average score below 60 ( $53.04 \pm 10.55$  e  $p \leq 0.0001$ ). The correlation between the SF-36 test score and the Katz Index was performed using the Pearson p test, with no statistically significant difference ( $p = 0.599$ ), presenting the correlation coefficient  $-0.125$ , considered a weak correlation, according to the Cohen scale. **CONCLUSION:** The elderly has a good level of functionality according to the Katz scale. However, there is a significant decline in their quality of life according to the SF-36 questionnaire. Physical therapy is an indispensable alternative for the prevention and rehabilitation of these patients.

**KEYWORDS:** Elderly. COVID-19. Quality of life. Functionality. Physiotherapy. Post-covid-19.

**RESUMO | INTRODUÇÃO:** Pacientes idosos, afetados pela COVID-19 apresentam uma série de complicações; entre elas, limitações, dificuldades ao realizar atividades que são consideradas básicas, além de apresentar quadro de depressão, reduzindo as chances de um retorno mais próximo das atividades de vida diária. **OBJETIVO:** Avaliar o nível de dependência nas atividades de vida diária e qualidade de vida em idosos sobreviventes da COVID-19 na Zona Rural de Coroatá - MA, além de verificar se existe associação entre o nível independência da vida diária e qualidade de vida. **MATERIAIS E MÉTODOS:** Estudo transversal, a coleta dos dados foi subdividida em duas etapas: variáveis sociodemográficas e econômicas, e a segunda etapa, variáveis de saúde física como presença de comorbidades autorreferidas e avaliação da Independência em Atividades da Vida Diária (EIAVD) pela Escala de Katz modificada e qualidade de vida pelo SF-36. A análise estatística descritiva representada pela frequência, porcentagem, média e desvio padrão. A análise inferencial realizada por meio do teste T de Student visando a obtenção de amostras independentes. O coeficiente de correlação de Pearson estabelecido entre o índice de Katz e o questionário SF-36. **RESULTADOS:** 20 idosos sobreviventes da COVID-19 participaram do estudo. A média de idade  $70,45 \pm 8,15$  anos. De acordo com a escala Katz, 85% dos idosos foram caracterizados como independentes nas seis funções (banhar-se, vestir-se, usar o banheiro, transferência, continência e alimentação). No SF-36, os participantes apresentaram uma pontuação média abaixo de 60 ( $53,04 \pm 10,55$   $p \leq 0,0001$ ). A correlação entre o escore do teste SF-36 e do Índice de Katz não apresentou diferença estatística significativa, coeficiente de correlação  $-0,125$ . **CONCLUSÃO:** Os sobreviventes da COVID-19 apresentaram um bom nível de funcionalidade, entretanto, houve declínio relacionado à sua qualidade de vida, nos domínios emocionais e desempenho físico. Não houve correlação entre o escore do teste SF-36 e do Índice de Katz.

**PALAVRAS-CHAVE:** Idosos. COVID-19. Qualidade de Vida. Funcionalidade. Fisioterapia. Pós-covid-19.

Submitted 11/16/2021, Accepted 01/05/2022, Published 01/28/22

J. Physiother. Res., Salvador, 2022;12:e4224

<http://dx.doi.org/10.17267/2238-2704rpf.2022.e4224>

ISSN: 2238-2704

Assigned editors: Cristiane Dias, Ana Lúcia Góes

*How to cite this article:* Silva FMS, Gomes JAC, Chaves PHN.

Independence in Avd's and quality of life in elderly survivors of covid-19 in the rural area of Coroatá-MA. J. Physiother. Res.

2022;12:e4224. <http://dx.doi.org/10.17267/2238-2704rpf.2022.e4224>

## Introduction

COVID-19 is a disease caused by SARS-CoV-2, which belongs to the Coronaviridae family. The first case of SARS-CoV-2 appeared in December 2019 in Wuhan, China. It is a resistant and easily transmitted virus that mainly affects the respiratory system, causing Severe Acute Respiratory Syndrome (SARS), changes in the musculoskeletal system<sup>1</sup>, vascular system<sup>1</sup>, and psychological<sup>2</sup>, among others. It can act in different ways on the body, ranging from totally asymptomatic cases to severe cases that lead to death.<sup>3-5</sup> Musculoskeletal symptoms are relatively common at the onset and throughout COVID-19 disease. They include myalgia, back pain, arthralgia, and fatigue, all associated with a muscular component.<sup>1</sup>

The pandemic outlook reveals that by December 21, 2021, a number of 275,466,533 confirmed cases and 5,361,332 deaths from COVID-19 have been recorded worldwide. In Brazil, the first case of COVID-19 was registered on February 26, 2020, and by December 21, 2021, 22,215,856 cases and 617,873 deaths have been registered. According to the epidemiological information in Brazil until June 3, 2020, 71% of the total deaths from COVID-19 corresponded to elderly people.<sup>6</sup>

The elderly are more vulnerable to infection by SARS-CoV-2, making them the population that presents the highest number of deaths, representing up to 80% of cases, besides the increase in the number of hospitalizations. This occurs due to the fragility that the organism presents, reflected in the corporal functions of the organism's protection against external agents, because some affections present themselves in a more severe form and with greater prevalence in the elderly, with an impact on the quality of life and in the execution of the activities of daily life.<sup>7-9</sup> Elderly patients affected by COVID-19 present a series of complications, including limitations and difficulties in performing activities that are considered basic, besides presenting depression that can be characterized by their distance from their families, which can generate other complications, reducing the chances of a close return to the activities of daily living.<sup>9</sup>

The specific treatment for patients affected by COVID-19 is still under development. Substances have been tested against the disease, but treatments using antivirals, immunotherapies, monoclonal

antibodies, and vaccines are evaluated according to their effectiveness; these have their main objective to prevent its progression.<sup>10</sup> Patients who present with infection or have already been discharged for COVID-19 must go through a rehabilitation process to improve their functional abilities and have a good physical recovery. Therefore, it is essential to evaluate the elderly in their totality and remember that each one presents distinct particularities that all multidisciplinary teams must observe and monitor. However, there are no concrete answers about distinct interventions that are applied; they are only based on preliminary results and scientific evidence.<sup>11</sup> The present study aims to evaluate the level of dependence in the activities of daily living and quality of life in elderly survivors of COVID-19 in the rural zone of Coroatá - MA, besides verifying if there is an association between the level of independence in the activities of daily living and quality of life.

## Material and Methods

This is a cross-sectional and descriptive study with a quantitative approach, with data collection through a questionnaire applied to elderly patients who were survivors of COVID-19, aged 60 years or older, of both genders, registered in a Family Health Strategy (ESF) in the rural area of Coroatá - MA, who agreed to participate in the research and signed the Informed Consent Form (TCLE). This study excluded elderly people bedridden before the infection by COVID-19 and those with any dementia proven by medical diagnosis.

Collections occurred from Monday to Friday, during the morning shift over March 2021, through previously scheduled home visits by Community Health Agents (ACS) to the 20 elderly survivors of COVID-19 registered in the ESF (up to the time when the study was conducted). Since this is a study with convenience sampling, only the elderly in residence were interviewed. In the absence of the elderly, the household was visited again, at another time; in case of repeated absence, the household was replaced.

All households in the village that had elderly people, previously informed by the ACS, who were diagnosed with COVID-19, were visited, according to a procedure adapted from Amaral et al.<sup>12</sup>, who conducted a study with a similar methodology to analyze the profile of

social support of the elderly in the municipality of Natal, state of Rio Grande do Norte, Brazil, 2010-2011.

Initially, the elderly received information about the research objectives, the questionnaire, and the TCLE. A time of 20 minutes was stipulated for completing the questionnaires. The research protocol consisted of filling out a questionnaire subdivided into two sessions: the first stage consisted of the socio-demographic and economic variables: age, personal income, education, and lifestyle habits. For the questions related to lifestyle habits, the only question asked was if the elderly had, in the last three months, drunk alcohol, smoked, done any physical activity (walking, dancing, weight lifting), or performed any activities of daily living (bathing, dressing, eating, functional mobility).

The second stage consisted of the physical health variables: the presence of self-reported comorbidities, according to the procedure described by Amaral et al.<sup>12</sup> asking about the presence of hypertension, diabetes mellitus, stroke, cancer, chronic lung disease, heart disease, rheumatism, and depression; general health perception; assessment of Independence in Activities of Daily Living (IADL) by the modified<sup>14</sup> Katz Index of Independence in Activities of Daily Living, and quality of life by the SF-36<sup>15</sup>.

The Independence Scale for Activities of Daily Living or modified Katz Scale is one of the scales used to evaluate the performance of activities of daily living. It consists of six items to measure the performance of individuals in self-care activities, which follow a complex hierarchical structure: eating, sphincter control, transferring, personal hygiene, dressing, and toileting.<sup>13</sup> The Short Form 36 (SF-36) questionnaire is characterized by offering a profile of patient scores that can assess the health conditions in which the individual finds himself or herself and to understand the differences that may exist within specific

populations concerning physical and mental health, disorders, and some other medical conditions, assessing the effects on the patient's health. The questionnaire has domains related to the physical and mental components, subdivided into eight, with a score between 0, which indicates the worst general state of health, and 100, corresponding to the best general state of health.<sup>14</sup>

The information obtained through the questionnaire was classified and grouped for better data analysis. The Statistical Package for the Social Science (SPSS) database in version 21.0 was used. The study results were presented in descriptive statistics with frequency, percentage, mean, and standard deviation to describe the data— inferential statistical analysis utilizing Student's t-test aimed at independent samples. Pearson's correlation coefficient was established between the Katz index and the SF-36 questionnaire.

The research was registered at Plataforma Brasil with Certificate of Ethical Appraisal Submission (CAAE): 41800721.4.0000.8007 and approved with an opinion no. 4.550.844. The requirements contained in Resolution No. 466/2012, which currently regulates the ethical and legal aspects of research with human beings, were considered. These were assured autonomy, non-maleficence, beneficence, anonymity, privacy, and the right to withdraw at any stage of the research, and the data collected will remain under the author's responsibility for at least five years. Each participant had their anonymity assured and signed a two-part TCLE. After completing the questionnaires, the interviewer stored the questionnaire in a sealed envelope to ensure that the researchers had access to confidential and private information to protect the image and non-stigmatization of the research participants.

## Results

All elderly survivors of COVID-19 registered at the ESF were selected for the study according to the eligibility criteria, totaling a sample of 20 elderly. Table 1 presents the sociodemographic and clinical characteristics of COVID-19 survivors. The majority of the participants were female. The age of the participants ranged from 61 to 86 years, with the mean age  $70.45 \pm 8.15$  years. Hypertension was the comorbidity that obtained the highest percentage, corresponding to 75% of the cases, followed by asthma with 5%. Of the 20 research participants, 11 (55%) reported having regular health, 50% reported never feeling lonely.

**Table 1.** Sociodemographic and clinical characterization of the elderly survivors of COVID-19, participants of the research (to be continued)

Variables	N	Percentage (%)
<b>Age</b>		
		70,45 ± 8,15
<b>Gender</b>		
Male	8	40,00%
Female	12	60,00%
<b>Ethnicity</b>		
Black	2	10,00%
White	6	30,00%
Brown	12	60,00%
<b>Profession</b>		
Farmer	19	95,00%
Teacher	1	5,00%
<b>Marital Status</b>		
Married	13	65,00%
Divorced	5	25,00%
Widowed	1	5,00%
Single	1	5,00%
<b>Education</b>		
Non-literate	10	50,00%
Elementary school incomplete	7	35,00%
Elementary school complete	2	10,00%
High school complete	1	5,00%
<b>Do you practice any physical activity?</b>		
Yes	6	30,00%
No	14	70,00%
<b>How do you rate your time?</b>		
Does household chores	11	55,00%
Does nothing	2	10,00%
Reads books, magazines and newspapers	1	5,00%
Works in the field	3	15,00%
Chats	3	15,00%
<b>Do you drink alcohol?</b>		
Yes	3	15,00%

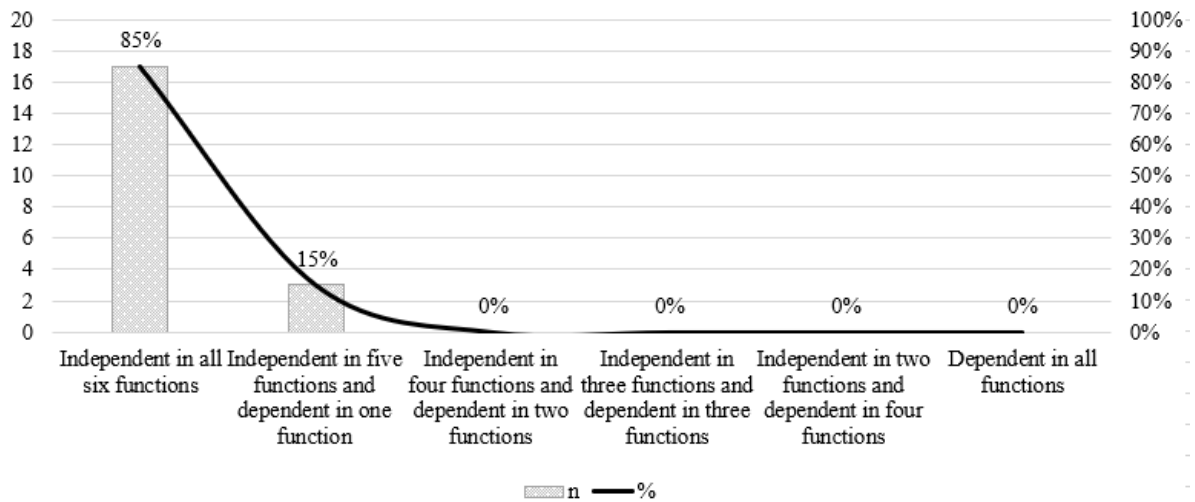
**Table 1.** Sociodemographic and clinical characterization of the elderly survivors of COVID-19, participants of the research (conclusion)

Variables	N	Percentage (%)
No	17	85,00%
Do you smoke tobacco?		
Yes	1	5,00%
No	19	95,00%
Do you take any continuous medication?		
Yes	18	80,00%
No	2	20,00%
Do you suffer from any of these diseases?		
Hypertension	15	75,00%
Nervous Gastritis	1	5,00%
Asthma	1	5,00%
None	3	15,00%
Do you have a respiratory disorder?		
Yes	1	5,00%
No	19	95,00%
How do you rate your health today?		
Good	7	35,00%
Regular	11	55,00%
Bad	2	10,00%
What is your main concern today?		
Health	9	45,00%
Family	8	40,00%
Be unable to work	2	10,00%
None	1	5,00%
Do you feel lonely?		
Always	1	5,00%
Often	2	10,00%
Sometimes	5	25,00%
Rarely	1	5,00%
Never	10	50,00%

Source: Research Data (2021).

According to the modified Katz Index of Independence in Activities of Daily Living, 85% of the elderly were characterized as independent in the six functions (bathing, dressing, toileting, transferring, continence, and eating), as evidenced in Figure 1.

**Figure 1.** Distribution of elderly survivors of COVID-19 according to the modified Katz Index of Independence in Activities of Daily Living.



Source: Research Data (2021).

According to table 2, the cases analyzed achieved a score of 6, showing mastery of all the items related to functionality, except for participants 9, 10, and 11, who obtained a difference in only one of the functions (continence) a score of 5.

**Table 2.** Numerical distribution of elderly survivors of COVID-19 according to the modified Katz Index of Independence in Activities of Daily Living

Volunteer	Index
1	6
2	6
3	6
4	6
5	6
6	6
7	6
8	6
9	5
10	5
11	5
12	6
13	6
14	6
15	6
16	6
17	6
18	6
19	6
20	6
Average	5,85

Source: Research Data (2021).

Table 3 shows the participants' results, in which the main attention is focused on the data referring to the average score of each evaluation domain of the applied questionnaire. According to the values, the change in health obtained an average of  $57.50 \pm 27.02$ . It is possible to observe that the participants did not present a satisfactory quality of life, corresponding to an average score below 60 points. The domains to be highlighted are those related to the emotional components that presented a reduction corresponding to an average of 36.67, followed by the one related to physical performance with an average of 40.31.

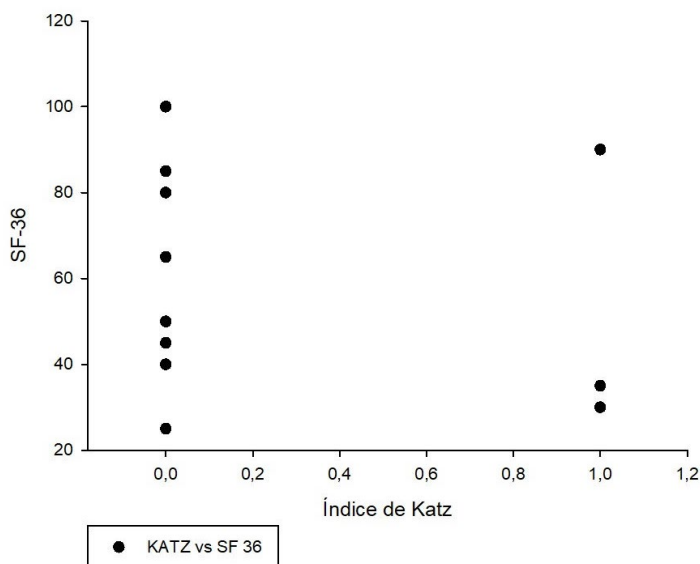
**Table 3.** SF-36 questionnaire score in elderly survivors of COVID-19 by domain

Component	Domain	Average	Standard deviation
Physical	Physical Function	57,75	20,93
	Physical Performance	40,31	25,45
	Body Pain	51,90	23,03
	General Health	51,20	13,15
	Vitality	55,00	14,85
Mental	Social Function	53,75	31,7
	Emotional Performance	36,67	30,52
	Mental Health	73,25	18,23
	Health Changes	57,50	27,02

Source: The authors (2021).

There was no correlation between the SF-36 test score and the Katz Index, with a correlation coefficient of -0.125, considered a weak correlation according to Cohen's scale ( $p = 0.599$ ), Figure 2.

**Figure 2.** Scatter plot of the correlation between the SF-36 questionnaire and the Katz Index in elderly survivors of COVID-19



Source: The authors (2021).

## Discussion

The purpose of the research was to evaluate the level of dependence in the activities of daily living and quality of life in elderly survivors of COVID-19 in the rural zone of Coroatá - MA, besides verifying if there is an association between the level of independence in the activities of daily living and quality of life. According to the results, 85% of the elderly were characterized as independent in the six functions (bathing, dressing, toileting, transferring, continence and eating), the elderly did not present a satisfactory quality of life with an average score below 60 points. There was no correlation between daily living independence and the quality of life of elderly survivors of COVID-19.

The population in question presents higher risks related to COVID-19 disease due to several factors that can aggravate it. Among these, one of the most frequent potential factors is related to the presence of chronic diseases such as hypertension, reported 75% in the analyzed population. According to a study by Batiha et al.<sup>15</sup>, hypertension increases the severity of COVID-19 due to underlying endothelial dysfunction, coagulopathy, and the dysregulation of angiotensin-converting enzyme 2 (ACE2).

In the current study, 70% of the participants reported that they did not practice physical activity, which may predict complications. According to Clemente-Suárez et al.<sup>16</sup> the COVID-19 negatively influences motor behavior, levels of regular exercise, dietary and nutritional patterns, and psychological status. Their results point out that physical activity improves patients' body composition, cardiorespiratory, metabolic, and mental health and improves antibody responses at vaccination. Researchers have shown that adults who had mild symptoms had low levels of physical activity, while those who had no symptoms engaged in moderate physical activity.<sup>17</sup>

Physical inactivity and an unhealthy lifestyle are risk factor for hospital admission for COVID-19.<sup>18</sup> However, in the current study, the frequency of hospitalization of the analyzed population was not investigated, characterizing one of the study's limitations.

The research participants present a decline in quality of life, with a greater impact on emotional

performance (36.67) and physical performance (36.67). Gomes et al.<sup>19</sup>, when analyzing the quality of life of elderly people not infected during the pandemic who attended the geriatrics outpatient clinic of the Catholic University of Brasília (UCB), Federal District, the findings reported a greater impact on the social domain. It is noteworthy that the study did not apply a structured and validated questionnaire. In addition, the participants were not infected by SARS-CoV-2.

Other researchers<sup>20</sup> analyzed 125 patient survivors of COVID-19 over six months after discharge from the Intensive Care Unit (ICU) using the SF-36 questionnaire, evidencing the majority (68%) of COVID-19 survivors had severe illnesses problems in terms of the physical component of health during the six-month follow-up according to the SF-36 assessment. In addition, 48% of the patients reported severe problems in terms of the mental health component. This fact may be justified as the study was conducted with elderly people hospitalized in the ICU; our study was conducted with elderly people who, although they were once infected with COVID-19, are already in the community.

Complementarily, we can mention the multicenter study performed by Chen et al.<sup>21</sup> to analyze the predictors of health-related quality of life and influencing factors for patients who survived COVID-19 during the first month after discharge, showing that the patients analyzed presented higher scores for body pain and vitality, but lower scores for physiological function, social function, and physical function. Borst et al.<sup>22</sup> performed a study with survivors of COVID-19 three months after the event, evidencing that a substantial proportion of patients still presented severe problems in several health domains three months after COVID-19, especially in those related to the physical function domains. These studies show similar results to those found in our research, demonstrating that survivors of COVID-19 present alterations in functional aspects evidenced in the physical domain of the SF-36.

For Souza et al.<sup>23</sup>, COVID-19 can result in changes in functional aspects, both related to the respiratory system and in other systems such as the cardiovascular system, thus causing impairment in the function of the respiratory muscles and in the tolerance of the individual in performing



activities of daily living and in specific exercises that lead to limitations in functional capabilities.

The results obtained, through the quality of life assessment instrument, presented important percentages related to the emotional components, being possible to observe that the emotional performance of the participants presented an average of  $36.67 \pm 30.52$ , which may have been caused by the delivery of a greater mental and psychological effort to perform some activities or even due to the aging process that makes the children no longer live with their parents. For Coronago, Bulhões and Silva<sup>24</sup>, the family plays an important role in their lives. The elderly face difficulties in dealing with issues involving aspects related to physical, psychological, and social well-being and the maintenance and/or regaining a sense of human dignity. Furthermore, 50% of the participants reported feeling lonely. The presence of feelings such as loneliness can be awakened during a pandemic, in which there is a need to keep social distance, and, for this, it is necessary to remain alert. In the elderly, besides measures to help them, the support of a professional is important.<sup>25</sup>

The quality of life of the elderly is not limited only to the absence of disease but also to other factors that may contribute to its progression, such as socio-demographic, psychosocial, and spiritual. In addition, it is essential to have a family with this population.<sup>25-29</sup> Sousa et al.<sup>28</sup> compare the quality of life with the performance of physical activities in the elderly. When adhering to such practices, it is possible to identify that this population can present a good quality of life concerning physical and emotional aspects.

Still, in the application of the SF-36 questionnaire, poor scores related to general health aspects ( $51.20 \pm 13.15$ ) lead to the conclusion that these elderly people have limitations related to housework and work. In addition, individuals with low scores in the general health domains ( $51.20 \pm 13.15$ ) lead us to think that they feel less healthy.

This could be explained through self-perception since individuals in higher age groups may report worse self-perception of health than younger ones.<sup>30</sup> Such participants may present an actual state of health that differs from their self-perception and may have significant physical limitations and/or changes in emotional components.

The results of this study may also direct to the existence of persistent symptomatology due to impairment in some functions related to the elderly, since, according to a study by Moreno-Pérez et al.<sup>4</sup> observed a high incidence of persistent symptoms in patients with COVID-19 (about 50%) from 10 to 14 weeks after disease onset, such as fatigue, dyspnea or neurological complaints. However, they were not associated with other pathological findings in the examinations performed.

Regarding the Activities of Daily Living assessed by the modified Katz Scale, 85% of the elderly were characterized as independent in the six functions (bathing, dressing, toileting, transferring, continence, and eating). Unfortunately, there is a scarcity in the literature of studies analyzing the level of independence in activities of daily living in elderly survivors of COVID-19. Although the elderly in our study depends on only one function, the loss of functional capacity will affect the body, mind, and social life.<sup>31,32</sup> However, studies investigating the level of activities of daily living of patient survivors of COVID-19 are needed.

The study's limitations are the sample size, which may hinder external validation, and the absence of data related to the time after COVID-19 and hospitalization. Prospective studies are recommended to investigate and obtain more accurate information on the quality of life and functionality of elderly survivors of COVID-19, which could contribute to the development of strategies to promote quality of life and independence of daily living post-COVID-19 elderly population.

## Conclusion

The survivors of COVID-19 showed a good level of functionality. However, there was a decline in their quality of life in the emotional domains and physical performance. There was no correlation between the SF-36 test score and the Katz Index.

## Authors' contribution

Gomes JAC participated in the conception, design, search, and analysis of research data, questionnaire application, data collection, interpretation of results, and preparation of the article writing. Chaves PHN participated in the conception, design, search, and analysis of the research data, application of the questionnaires, data collection, interpretation of results, and elaboration of the article writing. Silva FMS participated in the delimitation of the theme, preparation of the writing, orientation, and organization of the topics related to the scientific article.

## Competing interests

No financial, legal, or political conflicts involving third parties (government, private companies, foundations, etc.) have been declared for any aspect of the submitted work (including but not limited to grants and funding, advisory board participation, study design, manuscript preparation, statistical analysis, etc.).

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