ORIGINAL ARTICLE

ASSOCIATION BETWEEN POST-COVID-19 SYNDROME AND QUALITY OF LIFE IN QUILOMBOLA COMMUNITIES OF SANTARÉM, PARÁ, BRAZIL

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Highlights: (1). Post-COVID-19 Syndrome affects quality of life (2). Need for specific public health policies. (3). Urgency of personalized intervention strategies.

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ABSTRACT

Objective: To evaluate the association between Post-COVID-19 Syndrome and quality of life among quilombola populations in the municipality of Santarém, Pará, Brazil. Method: This cross-sectional quantitative study was conducted in the quilombola communities of Tiningu and Murumuru between August and September 2023. Initially, 32 individuals with documented or suspected post-COVID conditions were identified. After applying eligibility criteria, persistent symptoms for at least 12 weeks and exclusion of individuals with pre-existing conditions that could interfere with the assessment, the final sample comprised 25 participants. Data were collected through face-to-face interviews conducted in Portuguese, using standardized reading of response options. Health-related quality of life was assessed using the EQ-5D-5L instrument, which evaluates five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), along with the Visual Analogue Scale (VAS; range: 0-100) for self-perceived health status. Data analysis included descriptive statistics and association tests ($p < 0.05$), with comparisons of VAS scores across EQ-5D-5L dimension levels performed using the Kruskal–Wallis test. Logistic regression models (for categorized VAS scores) and linear regression models (for continuous VAS scores) were also applied. Results: Significant impairment was observed across multiple dimensions of quality of life, particularly regarding moderate pain/discomfort, reported by 56.0% of participants, as well as substantial limitations in mobility and usual activities. The mean VAS score was 63.3 (SD = 22.3), with a median of 70, indicating an intermediate overall perception of health. A negative correlation was identified between the severity of impairment across EQ-5D-5L dimensions and VAS scores ($r = -0.44$), suggesting a poorer perception of health as the burden of functional limitations increased. Conclusion: Among quilombola individuals affected by Post-COVID-19 Syndrome, evidence of reduced quality of life was observed, particularly in relation to pain/discomfort and functional aspects. These findings underscore the need for continued follow-up and targeted rehabilitation and mental health interventions within primary healthcare services, taking into account the specific vulnerabilities of these territories.

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

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INTRODUCTION

The COVID-19 pandemic, caused by SARS-CoV-2, emerged as an unprecedented global challenge, characterized by high morbidity and mortality rates, profound social repercussions, and substantial pressure on healthcare systems. As the number of survivors increased and scientific knowledge evolved, it became evident that COVID-19 is not limited to the acute phase of infection. A proportion of individuals continue to experience persistent or recurrent symptoms following the initial infection, a condition recognized as Post-COVID-19 Syndrome (Long COVID)[1,2]. This phenomenon has expanded the impact of the pandemic by prolonging healthcare and rehabilitation needs, shifting part of the disease burden into the post-infection period and requiring the reorganization of healthcare services, particularly within Primary Health Care[1,2].

Post-COVID-19 Syndrome is characterized by a broad and heterogeneous spectrum of manifestations, including fatigue, dyspnea, musculoskeletal pain, neurological and cognitive alterations, and emotional disturbances, often accompanied by functional limitations and reduced capacity to perform daily activities[3,4]. In practical terms, the persistence of symptoms may compromise self-care, mobility, work performance, social relationships, and mental health, directly affecting the well-being and autonomy of those impacted[3,4]. Beyond individual suffering, Long COVID also generates significant economic and social consequences, including work absenteeism and reduced productivity, increased utilization of healthcare services and diagnostic examinations, demand for rehabilitation, family burden, and direct and indirect costs that disproportionately affect populations with lower income and limited access to healthcare[5,6].

In this context, health-related quality of life becomes a key outcome for understanding the magnitude of the problem, as it encompasses physical, emotional, and social dimensions and enables the identification of the areas most affected and in need of targeted interventions[5,6]. Assessing quality of life among individuals with Post-COVID-19 Syndrome not only quantifies the functional and psychosocial impact of the condition but also supports the establishment of healthcare priorities, resource allocation, and the development of follow-up and rehabilitation strategies that are aligned with local realities[5,6].

Despite the growing body of literature on Post-COVID-19 Syndrome, an important gap remains regarding historically underrepresented populations affected by structural inequalities, such as quilombola communities[3-6]. Most available studies have been conducted in urban settings and among samples recruited from specialized healthcare services, which may limit the understanding of Long COVID in rural territories and among groups whose access to diagnosis, follow-up care, and rehabilitation is influenced by geographic, socioeconomic, and cultural barriers[7]. Furthermore, social vulnerabilities, work organization, dependence on long-distance travel to access healthcare services, and community support networks may influence both health perceptions and the impact of the condition on daily activities and mental health, highlighting the need for context-specific evidence[3,6].

It is within this context that the present study distinguishes itself from previous investigations. By focusing on quilombola populations in the Brazilian Amazon, specifically in communities located in the municipality of Santarém, Pará, and by systematically assessing quality of life using a standardized instrument (EQ-5D-5L), this study contributes to filling an important evidence gap in a poorly investigated territory. It provides a more contextually grounded understanding of the domains most affected by Post-COVID-19 Syndrome, including mobility, self-care, usual activities, pain/discomfort, and mental health. In addition to advancing scientific knowledge, this approach facilitates the translation of findings into practice by aligning with the organization of local healthcare services and the need for integrated and culturally sensitive interventions aimed at reducing health inequities and improving post-COVID care among vulnerable populations[8].

In light of the above, this study aimed to evaluate the impact of Post-COVID-19 Syndrome on the quality of life of quilombola individuals from the Tiningu and Murumuru communities, located in the municipality of Santarém, Pará, Brazil. By doing so, it seeks to enhance understanding of the extent of condition-related limitations and to support the development of equitable, territory-oriented follow-up and rehabilitation strategies based on the actual needs of these communities.

METHOD

This was a cross-sectional, quantitative study with descriptive and analytical (associative) characteristics, conducted through field research in the quilombola communities of Tiningu and Murumuru, located in the rural area of the municipality of Santarém, Pará, Brazil (approximately 45 km from the municipal headquarters). Data collection was carried out between August and September 2023 through face-to-face approaches and verbal invitations to residents, in collaboration with the Primary Health Care Unit located in Tiningu.

The study population consisted of residents from these communities with records of post-COVID conditions. To identify participants with Post-COVID-19 Syndrome (Long COVID), the diagnostic criteria adopted by physicians working in the Primary Health Care Units and documented in clinical records were considered, including the presence of persistent symptoms for ≥12 weeks following the initial infection. Eligible participants were individuals aged 18 years or older, with a confirmed diagnosis recorded in medical records and persistent complaints compatible with the condition. Individuals with significant communication difficulties that could compromise the interview process, those whose diagnosis was revised after notification, and, most importantly, those with pre-existing conditions or illnesses with the potential to substantially interfere with the evaluated outcomes (pre-existing interfering conditions) were excluded.

During the study period, 32 individuals with documented or suspected Post-COVID-19 Syndrome were initially identified within the communities. After the application of the eligibility criteria, seven individuals were excluded due to pre-existing interfering conditions, resulting in a final sample of 25 participants. This sample corresponded to all confirmed and eligible cases identified within the study area and timeframe. It should be noted that this was a non-probabilistic sample restricted to two communities; therefore, the findings should be interpreted as representative of the specific context investigated and should not be broadly generalized to other quilombola populations.

Questionnaires were administered in a private setting through face-to-face interviews conducted in Portuguese by the same previously trained and standardized interviewers. Standardized procedures were adopted for reading both the questions and response options. Sociodemographic and household variables were collected, including the number of individuals residing in the household, sex, self-reported race/ethnicity, marital status, educational level, religion, age group, monthly family income, and occupation.

Health-related quality of life was assessed using the EQ-5D-5L, a generic instrument composed of five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) and a Visual Analogue Scale (VAS) ranging from 0 to 100 for self-rated overall health status. The EQ-5D-5L has been translated and validated for use in Brazil[9]; however, no specific validation study has been published for quilombola populations. Therefore, interviewer-administered application, accessible language, and standardized reading procedures were adopted to ensure adequate comprehension of all items.

Statistical analyses were performed using IBM SPSS Statistics version 20.0, adopting a significance level of $p < 0.05$. Initially, descriptive analyses were conducted using absolute and relative frequencies, as well as measures of central tendency and dispersion when appropriate. In the bivariate analysis, the relationship between self-perceived health scores and the levels of the EQ-5D-5L dimensions was assessed using the Kruskal-Wallis test, considering the ordinal nature of the dimensions and the potentially non-normal distribution of the outcome variable. Associations between categorical variables were evaluated using Pearson’s chi-square test and, when expected cell frequencies were insufficient, Fisher’s exact test.

For multivariate analyses, the outcome was considered in two ways: (1) categorized to estimate odds ratios (OR), using VAS scores below a predefined study cutoff point (e.g., below the median or a reference value), and (2) as a continuous variable in linear regression models, with VAS scores (0-100) as the outcome. In the linear regression models, the relevant assumptions were assessed, including linearity, residual distribution, homoscedasticity, and absence of multicollinearity. Only variables demonstrating statistical significance in the bivariate analyses and/or theoretical relevance were included in the final models, thereby reducing the risk of overfitting and enhancing analytical consistency.

The associations among mobility, self-care, usual activities, pain/discomfort, anxiety/depression, and the overall health index were visually represented through a relationship map generated in SPSS 20.0. This map was constructed based on an association matrix derived from the study variables, considering the statistical relationships observed during the bivariate analysis. The map was interpreted descriptively, whereby greater proximity or clustering indicated stronger recurrence or intensity of association among variables within the analyzed dataset. It was used as a complementary visual synthesis tool and not for causal inference.

The study was approved by the Research Ethics Committee of the Universidade do Estado do Pará under approval number 6.298.330, in accordance with Brazilian National Health Council Resolution No. 466/2012. Confidentiality, voluntary participation, and participant safety were ensured throughout all stages of the research.

RESULTS

The final sample consisted of 25 participants with a confirmed diagnosis of Post-COVID-19 Syndrome. A predominance of women was observed (72.0%), as well as individuals who self-identified as Black (60.0%), followed by mixed-race (16.0%), Indigenous (12.0%), and White participants (4.0%). Most participants reported being married or living in a stable union (68.0%). Educational attainment was primarily concentrated among those with 4–8 years of schooling (56.0%), followed by 9–11 years (24.0%), fewer than 4 years (16.0%), and 12 years or more (4.0%). Regarding religious affiliation, a similar distribution was observed between Catholics (52.0%) and Evangelicals (48.0%).

With respect to age profile and living conditions, the highest proportion of participants were aged 60 years or older (52.0%), followed by those aged 40–59 years

(28.0%) and those younger than 40 years (20.0%). Household composition revealed a greater frequency of residences with five or more inhabitants (48.0%), suggesting the presence of extended family arrangements. Concerning monthly household income, the most prevalent category was 3 to 5 minimum wages (52.0%), followed by more than 5 minimum wages (36.0%) and fewer than 3 minimum wages (12.0%). Regarding occupational status, 48.0% reported being employed at the time of the study, whereas 52.0% were not working. These findings portray a heterogeneous socioeconomic profile and indicate the presence of social vulnerabilities that are relevant to the interpretation of quality-of-life outcomes.

Table 1. Sociodemographic and Economic Characteristics of Participants with Post-COVID-19 Syndrome (n = 25)

Variables	**Category**	**n**	**%**
Household Size	≥5 persons	12	48.0
	2 persons	5	20.0
	3–4 persons	5	20.0
	1 person	3	12.0
Sex	Female	18	72.0
	Male	7	28.0
Race/Ethnicity	Black	15	60.0
	Mixed-race (Pardo)	4	16.0
	Indigenous	3	12.0
	White	1	4.0
	Other/Not reported	2	8.0
Marital Status	Married/Common-law union	17	68.0
	Single	4	16.0
	Separated/Other	2	8.0
	Divorced	1	4.0
	Widowed	1	4.0
Educational Level	4–8 years of schooling	14	56.0
	9–11 years of schooling	6	24.0
	<4 years of schooling	4	16.0
	≥12 years of schooling	1	4.0
Religion	Catholic	13	52.0
	Evangelical	12	48.0
Age Group (years)	≥60	13	52.0
	40–59	7	28.0
	<40	5	20.0
Monthly Household Income (Minimum Wages)	3–5	13	52.0
	>5	9	36.0
	<3	3	12.0
Currently Employed	No	13	52.0
	Yes	12	48.0

Abbreviations: *n* = absolute frequency; % = relative frequency.
Source: Authors, 2023.

Table 2 presents the analysis of health- and well-being-related variables, showing the percentage distribution of responses and their respective p-values. In the Mobility dimension (p = 0.034), 24.0% of participants reported having no problems walking, while 24.0% reported slight problems, 28.0% moderate problems, 20.0% severe problems, and 4.0% indicated being unable to walk. Regarding Self-Care (p = 0.165), most participants (72.0%) reported no difficulties with washing or dressing themselves; however, 12.0% reported slight problems, 8.0% moderate problems, 4.0% severe problems, and 4.0% were unable to perform these activities independently.

In the Usual Activities dimension (p = 0.289), 36.0% reported no problems performing daily activities, whereas 36.0% experienced slight limitations and 20.0% moderate limitations. No participants reported severe problems (0.0%); however, 8.0% reported being unable to perform their usual activities. Regarding Pain/Discomfort (p = 0.090), only 4.0% reported the absence of pain, while 24.0% experienced slight pain, 56.0% moderate pain, 12.0% severe pain, and 4.0% extreme pain. For the Anxiety/Depression dimension (p = 0.288), 28.0% reported no symptoms, whereas 28.0% experienced mild symptoms, 16.0% moderate symptoms, 20.0% severe symptoms, and 8.0% reported being extremely anxious or depressed, indicating substantial psychosocial impairment within the sample (Table 2).

Table 2. Distribution of Responses Across EQ-5D-5L Dimensions and Their Association with Self-Perceived Health Scores (VAS 0–100) Among Participants with Post-COVID-19 Syndrome (n = 25)

Variables	n	%	p-value*
MOBILITY			0.034
1. I have no problems walking	6	24.0	
2. I have slight problems walking	6	24.0	
3. I have moderate problems walking	7	28.0	
4. I have severe problems walking	5	20.0	
5. I am unable to walk	1	4.0	
SELF-CARE			0.165
1. I have no problems washing or dressing myself	18	72.0	
2. I have slight problems washing or dressing myself	3	12.0	
3. I have moderate problems washing or dressing myself	2	8.0	
4. I have severe problems washing or dressing myself	1	4.0	
5. I am unable to wash or dress myself	1	4.0	
USUAL ACTIVITIES			0.289
1. I have no problems performing my usual activities	9	36.0	
2. I have slight problems performing my usual activities	9	36.0	
3. I have moderate problems performing my usual activities	5	20.0	
4. I have severe problems performing my usual activities	0	0.0	
5. I am unable to perform my usual activities	2	8.0	
PAIN/DISCOMFORT			0.090
1. I have no pain or discomfort	1	4.0	
2. I have slight pain or discomfort	6	24.0	
3. I have moderate pain or discomfort	14	56.0	
4. I have severe pain or discomfort	3	12.0	
5. I have extreme pain or discomfort	1	4.0	
ANXIETY/DEPRESSION			0.288
1. I am not anxious or depressed	7	28.0	
2. I am slightly anxious or depressed	7	28.0	
3. I am moderately anxious or depressed	4	16.0	
4. I am severely anxious or depressed	5	20.0	
5. I am extremely anxious or depressed	2	8.0	

Regarding self-rated health status, assessed through the Visual Analogue Scale (VAS) of the EQ-5D-5L instrument based on the question, “On a scale from 0 to 100, how is your health today?”, where higher scores indicate better perceived health-participants with Post-COVID-19 Syndrome presented a mean score of 63.3 (SD = 22.3) and a median of 70. These findings suggest an intermediate overall perception of health, ranging from fair to good, despite the limitations identified in the other dimensions of the questionnaire. This result indicates that, for most participants, the post-COVID condition is associated with a moderate self-assessment of health status, although it does not preclude the presence of functional and psychosocial impairments.

A wide variation in VAS scores was observed, ranging from 5 to 100, highlighting substantial heterogeneity in the experiences of individuals living with Post-COVID-19

Syndrome. This dispersion suggests that the impact of the condition is not uniform: while some participants perceived their health at relatively high levels, others reported very low ratings, consistent with a greater symptom burden and/or more pronounced limitations in daily activities. These findings reinforce that Post-COVID-19 Syndrome may manifest with varying degrees of severity, reflecting diverse recovery trajectories and potentially additional challenges related to living conditions and access to healthcare services.

Regarding Table 3, the odds ratio (OR) results provide important insights into the relationship between quality-of-life variables and self-reported health status. Concerning mobility, individuals who reported no difficulty walking were approximately 4.23 times more likely to rate their health more positively compared with those experiencing mild, moderate, or severe mobility problems. Conversely, participants who reported being unable to walk had a substantially lower likelihood of perceiving their health positively, with an OR of approximately 0.32, indicating a reduced probability of reporting better health status.

Table 3. Variation in the Odds Ratio (OR) of Self-Reported Health Assessments Across Different Quality-of-Life Domains

Variable	Odds Ratio (OR)
I have no problems walking	4.23
I have slight problems walking	0.60
I have moderate problems walking	1.00
I have severe problems walking	1.00
I am unable to walk	0.32
I have no problems washing or dressing myself	21.89
I have slight problems washing or dressing myself	0.39
I have moderate problems washing or dressing myself	1.00
I have severe problems washing or dressing myself	2.68
I am unable to wash or dress myself	0.32
I have no problems performing my usual activities	2.36
I have slight problems performing my usual activities	2.36
I have moderate problems performing my usual activities	0.81
I have severe problems performing my usual activities	2.68
I am unable to perform my usual activities	0.32
I have no pain or discomfort	1.38
I have slight pain or discomfort	0.64
I have moderate pain or discomfort	1.38
I have severe pain or discomfort	1.00
I have extreme pain or discomfort	0.32
I am not anxious or depressed	2.00
I am slightly anxious or depressed	0.28
I am moderately anxious or depressed	0.81
I am severely anxious or depressed	2.68
I am extremely anxious or depressed	0.32

Regarding Self-Care, individuals who reported no difficulties with washing or dressing themselves exhibited a substantially higher odds ratio, approximately 21.89, compared with those experiencing mild, moderate, or severe difficulties in this domain. In contrast, participants who were unable to perform these activities independently showed a considerably lower likelihood of reporting better health status, with an odds ratio of approximately 0.32.

Concerning Usual Activities, individuals who reported no difficulties in carrying out their daily activities were approximately 2.36 times more likely to report higher health ratings. Conversely, participants experiencing severe difficulties in performing usual activities demonstrated a reduced likelihood of positive health evaluations, suggesting a negative influence on overall quality of life.

With respect to Pain/Discomfort, participants who reported no pain or discomfort were approximately 1.38 times more likely to report better health status. In contrast, individuals experiencing moderate or severe pain/discomfort presented an odds ratio close to 1.00, indicating no substantial increase in the likelihood of perceiving their health more positively.

Regarding Anxiety/Depression, individuals who did not report symptoms of anxiety or depression were approximately 2.00 times more likely to report higher health ratings. Conversely, those reporting moderate or severe symptoms demonstrated a lower likelihood of positive health perceptions, suggesting a considerable impact of psychological distress on self-rated health.

As shown in Table 4, each improvement in the Mobility dimension was associated with an average increase of 0.28 points in quality-of-life scores. This finding suggests that better mobility status is positively associated with a more favorable overall perception of quality of life. In contrast, each increase in difficulties related to Self-Care was associated with an average decrease of 0.26 points in quality-of-life scores, indicating that challenges in activities such as washing and dressing are linked to poorer perceptions of quality of life.

Each increase in difficulties related to Usual Activities was associated with an average increase of 0.18 points in quality-of-life scores. This finding suggests that, unexpectedly, greater challenges in performing daily activities may coincide with a more positive overall perception of quality of life. Similarly, each increase in Pain/Discomfort levels was associated with an average increase of 0.10 points in quality-of-life scores. This may indicate that, in some cases, the presence of pain or discomfort can coexist with relatively positive perceptions of quality of life.

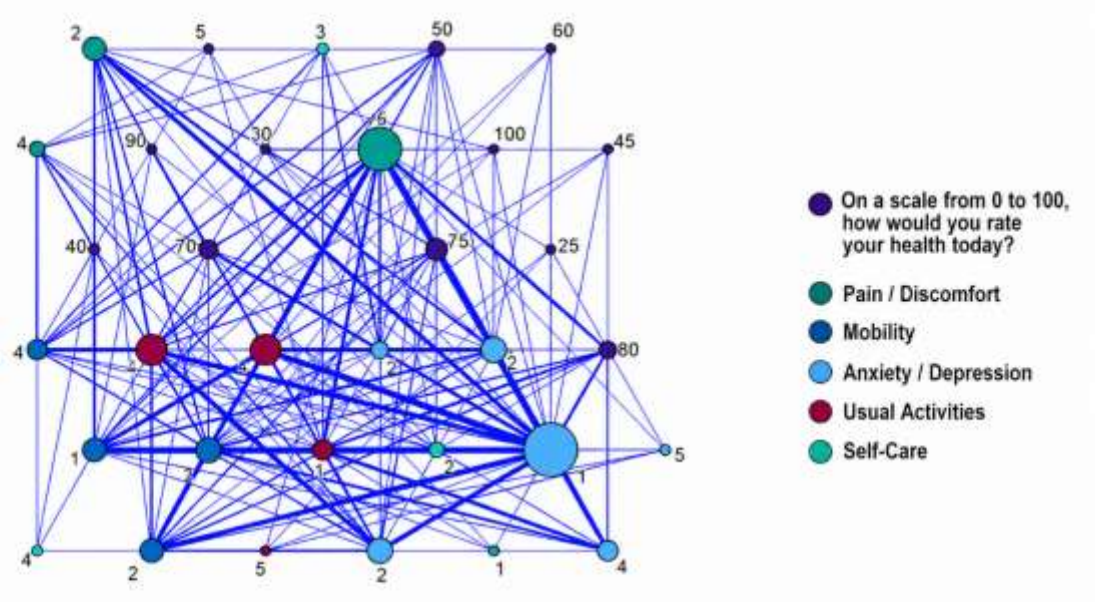
Finally, each increase in Anxiety/Depression levels was associated with an average decrease of 0.05 points in quality-of-life scores. This result suggests that higher levels of anxiety or depression are associated with poorer overall perceptions of quality of life (Table 4).

Table 4. Linear Regression Model Coefficients Between EQ-5D-5L Dimensions and Self-Perceived Health Score (VAS 0–100)

Category	Intercept (β_0)	Coefficient (βCategory)
Mobility	69.32	0.28
Self-Care	70.45	-0.26
Usual Activities	71.12	0.18
Pain/Discomfort	70.77	0.10
Anxiety/Depression	70.92	-0.05

The relationship map (Figure 1) provides a concise overview of the main associations observed among the variables analyzed, highlighting the most prominent clusters and connections. As illustrated in Figure 1, certain elements exhibit a greater number of links and closer proximity to other components within the diagram, suggesting more frequent and/or stronger associations within the evaluated dataset. Thus, the figure complements the descriptive and inferential findings of the study by facilitating an integrated visualization of the relationship patterns among the analyzed variables.

Figure 1. Relationship map showing the connections between Mobility, Personal Care, Habitual Activities, Pain/Discomfort, Anxiety/Depression, and the General Health Index in Quality of Life.



The presence of pain and discomfort appears to directly influence self-perceived health status. Individuals who reported being free from pain or discomfort exhibited a higher likelihood of reporting better health evaluations (OR = 1.38). However, as pain intensity increased, the odds ratio remained at 1.00 for severe pain, suggesting that while the presence of pain is associated with a decline in perceived health status, greater severity does not appear to exert an additional negative effect on self-rated health.

The ability to perform self-care activities, such as washing and dressing independently, also plays a crucial role in health self-perception. Participants who reported no difficulties in these activities demonstrated a markedly higher likelihood of reporting more positive health evaluations (OR = 21.89). Conversely, individuals who were unable to perform these activities independently showed a substantially lower likelihood of reporting better health status (OR = 0.32), indicating that dependence in self-care is associated with less favorable perceptions of health.

DISCUSSION

Overall, this study demonstrated that Post-COVID-19 Syndrome was associated with reduced quality of life among quilombola individuals from Santarém, with greater impairment observed in the EQ-5D-5L domains related to mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Furthermore, greater severity and persistence of post-COVID symptoms were associated with poorer quality-of-life scores, suggesting significant functional and psychosocial repercussions in participants' daily lives. These findings, generated within an Amazonian context and among a population historically underrepresented in the scientific literature, highlight the need for comprehensive and culturally sensitive follow-up care, a topic explored throughout this discussion.

The analysis of the findings reveals a range of factors influencing participants' health and quality of life, reflecting the complex interaction between family composition, gender, race, education, income, religion, age, and other sociodemographic characteristics. The predominance of households with two members, for example, raises questions regarding how domestic support dynamics affect well-being, suggesting that both family structure and household size may have significant implications for the ways individuals cope with health-related challenges[10].

In addition, the relatively balanced sex distribution within the sample prompts reflection on potential differences in health perception and management between men and women, opening avenues for discussion regarding how gender norms and healthcare-seeking behaviors influence overall well-being[11]. The racial diversity observed in the sample further highlights the importance of addressing how social and racial inequalities may shape access to and quality of healthcare services, emphasizing the need for health policies that recognize and address such disparities[12].

The relationship between education, income, and health represents another critical aspect emerging from these findings. Higher levels of education and income are generally associated with better health outcomes, reinforcing the need for strategies aimed at reducing socioeconomic barriers to well-being[13]. These findings support the implementation of public policies that promote health equity by improving access to educational and economic resources as a means of enhancing perceived health and quality of life.

The predominance of Evangelical participants in the sample provides a valuable opportunity to explore how religious beliefs and practices may serve as coping mechanisms in the face of health-related adversity[14,15]. This observation suggests possible pathways through which faith may influence not only how individuals confront health challenges but also how they perceive and evaluate their own health and well-being.

The age distribution of participants, with a substantial proportion concentrated in the 40–59-year age group, draws attention to the specific health challenges experienced during this stage of life. These include the onset of chronic diseases and the importance of preventive health approaches, underscoring the need for interventions tailored to the characteristics of this age group[16].

The findings related to health and well-being, particularly those concerning mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, underscore the importance of these variables in determining quality of life. The results indicate that difficulties in these domains are significantly associated with less favorable perceptions of health[17]. Specifically, the ability to perform self-care activities independently and the absence of pain and discomfort were strongly associated with more positive health evaluations, as evidenced by the reported odds ratios.

The relationship between functionality and quality of life is particularly noteworthy. The linear regression analyses demonstrated that improvements in mobility and the ability to perform usual activities were associated with higher quality-of-life scores, whereas difficulties in self-care and higher levels of anxiety/depression were associated with poorer perceptions of quality of life[18]. These findings suggest that interventions aimed at improving functional capacity and emotional well-being may substantially influence how individuals perceive their health.

Furthermore, the relationship map illustrating the associations among study variables provides a visual representation of the interconnected nature of different health and quality-of-life dimensions. The map highlights how pain, discomfort, self-care, and other factors are interrelated and collectively influence health perception. These results suggest that, within this population, the experience of pain, the ability to perform self-care activities, and consequently the degree of independence in daily functioning play a significant role in self-rated health. Such findings may have important implications for health promotion strategies and interventions focused on improving physical well-being and functional capacity, with the potential to positively influence individuals' perceptions of their own health.

The results underscore the complexity of health and quality of life, demonstrating how multiple aspects of life and functionality are interconnected. The findings support the need for holistic and inclusive approaches that consider the intersection of demographic and socioeconomic factors when designing health promotion strategies. Targeted interventions focused on improving mobility, alleviating pain, providing emotional support, and enhancing independence in daily activities may contribute substantially to improving quality of life[8,19].

Several limitations should be acknowledged. First, the cross-sectional design precludes establishing causal relationships between Post-COVID-19 Syndrome and reduced quality of life, allowing only the identification of associations at the time of assessment. Second, because the sample was restricted to two quilombola communities (Tiningu and Murumuru) and may be considered relatively small, the generalizability of the findings to other communities and contexts should be approached with caution. Potential selection bias should also be considered, as participation depended on availability and willingness to participate. Likewise, information bias may have occurred because some variables were self-reported and therefore subject to recall inaccuracies and individual interpretation of symptoms. Additionally, the absence of longitudinal follow-up and the limited control of potential confounding factors, such as pre-existing comorbidities, severity of the acute infection, access to healthcare services, and socioeconomic conditions, may have influenced quality-of-life scores. These considerations reinforce the need for longitudinal studies with larger samples to further investigate the observed associations.

Despite these limitations, this study fills an important gap in the literature by generating evidence on Post-COVID-19 Syndrome and its impact on quality of life among quilombola communities in the Brazilian Amazon, specifically in the municipality of Santarém, a population historically underrepresented in research on post-acute COVID-19 conditions. While much of the available evidence has been derived from urban populations and contexts with greater access to healthcare services, the present findings contextualize the post-COVID experience in territories marked by social vulnerabilities, geographic barriers, and cultural specificities. Moreover, they identify the quality-of-life dimensions most affected in this setting, including mobility, self-care, usual activities, pain/discomfort, and mental health.

Thus, in addition to advancing scientific knowledge, this study provides practical evidence to support the planning of actions within primary healthcare and broader care networks, contributing to the development of more equitable and culturally sensitive interventions and public policies aimed at rehabilitation and post-COVID follow-up among quilombola populations.

CONCLUSION

The findings of this study, which evaluated the impact of Post-COVID-19 Syndrome on the quality of life of quilombola individuals in the municipality of Santarém, indicate that the post-COVID condition is associated with significant impairments in quality of life. These impairments were particularly evident in the EQ-5D-5L domains of mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, highlighting important functional and psychosocial repercussions in daily life.

Greater severity and persistence of post-COVID symptoms were associated with poorer quality-of-life scores, reinforcing the need for continuous monitoring and comprehensive healthcare approaches. These results underscore the urgency of developing equitable and culturally sensitive public health policies and interventions that account for demographic, socioeconomic, and territorial differences. Specific actions within primary healthcare and integrated care networks should focus on physical rehabilitation, pain and fatigue management, mental health support, and improved access to healthcare resources.

Future longitudinal studies are recommended to better understand the progression of Post-COVID-19 Syndrome and quality of life over time, as well as to evaluate the effectiveness of targeted interventions. Additionally, the integration of digital health technologies may enhance monitoring and care through telemonitoring, symptom screening, and remote follow-up. Intersectoral collaboration among health, education, housing, and transportation sectors is also essential to address the broader determinants influencing recovery and well-being in quilombola communities.

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