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Original Research Article

Quality of life and its associated factors among COVID-19 recovered patients in South India: a cross-sectional analytical study

Vanessa Ravel, Venkatachalam Jayaseelan*, Vignesh Rajan S., Renjana Sivaji, Arul Prasad R., Mahadevan D., Sitanshu Sekhar Kar

Department of Preventive and Social Medicine, JIPMER, Puducherry, India

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***Correspondence:**
Dr. Venkatachalam Jayaseelan,
E-mail: drvenkatpgi@gmail.com

ABSTRACT

Background: Coronavirus disease (COVID-19), a pandemic affecting billions globally has impacted beyond physical health affecting mental and social well-being thereby affecting quality of life (QOL). This study aimed to explore the long-term sequalae of COVID-19 and compare QOL between those who had moderate or severe COVID-19 and those with mild disease and to assess the factors associated with their QOL.
Methods: This cross-sectional analytical study was conducted among COVID-19 recovered patients between May-October 2022. Patients with oxygen saturation (SpO_2)≤93 were considered as moderate to severe cases (group 1) and those with SpO_2 >93 as mild cases (group 2). Participants selected by simple random sampling from the line-list of hospital records and their socio-demographic details were collected. QOL was assessed using validated English and Tamil version of world health organization QOL brief (WHOQOL-BREF) questionnaire.
Results: Among the 1162 participants (581 in each group), majority were males (52.4%) with mean age of 48 (±16.4) years. Mean WHOQOL-BREF scores among participants was highest in social domain (71.7±9.2) and lowest in physical domain (58±8.2). Scores of all domains were significantly higher in group 2 than group 1. The predictors for lower QOL were skilled workers, people residing in rural areas, individuals above 30 years and presence of comorbidities in physical, psychological, social and environmental domains ($p<0.001$).
Conclusions: COVID-19 has long-term effect on QOL of the patients. This study stresses the need for implementing strategies like post-COVID special clinics and counselling sessions to improve QOL of the affected individuals.

Keywords: COVID-19, Pandemic, Post-acute COVID-19 syndrome, QOL, SARS-CoV-2, WHOQOL-BREF

INTRODUCTION

Since the initial report of severe acute respiratory syndrome coronavirus 2 (SARS CoV-2), which causes coronavirus disease (COVID-19), on December 31, 2019, the virus had dominated everyone's life around the world.[1] COVID-19 presents a spectrum of clinical manifestations ranging from subclinical, mild to fulminant and deadly. Severe infections resulted in serious complications such as pneumonia, acute respiratory distress syndrome (ARDS), sepsis, multiple organ failure, blood clotting, myocarditis, acute myocardial infarction, acute kidney injury, along with other viral and bacterial infections. Adult COVID-19 pneumonia symptoms include fever, dry cough, sore throat, headache, lethargy, myalgia, and shortness of breath.[2-5] The virus has infected about 77 crore individuals around the world and resulted in 7 million mortalities. In India, about 4.5 crore individuals have been infected of which 1.7 lakh individuals are from Puducherry.[6] COVID-19 has a multifaceted impact on health as well as various other domains such as the economics, behavior, lifestyle, and QOL.[6,7]

The WHO defined QOL as an individual's perception of their position in life in the context of the culture and value systems in which they live, and concerning their goals, expectations, standards, and concern.[8] HRQoL evaluates a person's overall physical, emotional, and social well-being in a single outcome measure. A reduction in HRQoL is frequently documented in groups with persistent difficulties, including survivors of infectious illnesses post-covid persisting symptoms may result in functional impairment, affecting daily living and resulting in low HRQoL. Recent systematic review indicates that factors such as gender, older age, presence of co-morbidities, intensive care unit (ICU) admission, prolonged ICU stay, and mechanical ventilation are commonly associated with decreased levels of HRQoL post COVID-19.[9]

Despite recent speculative claims of deteriorating mental health in people in India following the pandemic, systematic assessments of these impacts remain limited. Studies have highlighted that QOL were affected during lockdown period yet such studies were conducted on general population.[10] There is a dearth of literature in assessing the HRQoL among patients recovered from COVID-19 in India.

Our study aimed to address this gap by investigating how severity of COVID-19 affects HRQoL in long term and also identifying the predictors of HRQoL outcomes. The study also compares HRQoL based on severity of COVID-19.

METHODS

Study design and setting

This cross-sectional analytical study was conducted among COVID-19 patients seeking care in a tertiary care hospital in Pondicherry, South India. Pondicherry has a strong healthcare system with 39 primary health centres (24 rural, 15 urban) which are well connected to tertiary care hospital for management of COVID and post-COVID. Moderate to severe cases are managed at hospitals and mild cases managed at community level with regular follow up, after initial assessment at hospitals. A dedicated COVID task force was also established to oversee the quality of treatment and monitor home isolated patients.

Sample size and sampling technique

The study included patients aged ≥18 years who tested positive for COVID-19 via RT-PCR, Rapid Antigen Test or radiological imaging, managed and recovered between May-October 2022, from the line-list of COVID-19 cases from hospital records. Patients were classified into two groups based on their SpO_2 levels as per the records: those with $SpO_2 \leq 93\%$ as moderate to severe cases, and those with $SpO_2 > 93\%$ as mild to asymptomatic cases. Participants were selected through simple random sampling using random number table to achieve sample size of 1,162 cases (581 in each group). The sample size was calculated using OpenEpi software.

Study procedure

Phone numbers were obtained from medical records department of the tertiary hospital and the trained research team conducted home visits to assess the participant's health conditions 6 months following their COVID infection (from November 2022 to April 2023). During these visits, socio-demographic details and clinical details were obtained through semi-structured data collection proforma. The self-reported short term and long-term complications of post-COVID like dyspnoea, fatigue, loss of smell and taste, stomach pain as well as the chest pain were also assessed during that time. The QOL was assessed using the WHOQOL-BREF questionnaire.

Study instrument

QOL was assessed using WHOQOL-BREF, a brief validated version of the WHOQOL-100 QoL assessment questionnaire.[11] It consists of 26 questions, 24 of which are separated into four domains: physical, psychological, social relations, and environmental. The remaining two questions evaluate self-perceived QOL and health satisfaction representing the overall domain. The physical health domain questions are focused on daily activities, medical assistance, energy, mobility, pain severity, sleeping pattern, and working ability. Personal ideas, positive and negative feelings, self-esteem, body image, thinking and learning capacities are all addressed in the psychological domain. The social domain investigates the respondent's overall satisfaction with their personal and social lives.

Finally, the environment domain includes concerns about safety and security, satisfaction with one's property and physical surroundings, economics (does one have enough money to meet one's needs), access to required care, information, and transportation. Each item is rated on a 5point scale and higher scores denote higher QOL except for three reverse-scoring items (Q3, Q4, and Q26), where higher scores reflect lower QOL.

The mean score of items within each domain was used to calculate the domain score. The mean scores were then transformed to a 0-100 scale to make domain scores comparable with the scores used in the WHO QOL-100.

Ethical consideration

Ethical clearance was obtained from the institutional ethics committee (JIP/IE, Date of approval of ethics is JIP/IEC/2021/305). Written informed consent was obtained from all the participants. Procedures were in accordance with the ethical standards of the Helsinki declaration of 1975, as revised in 2000.

Statistical analysis

Data collected using Epicollect5 software and analyzed using SPSS version 22. Continuous variables such as QOL scores were summarized as mean with standard deviation (SD) or median with interquartile range (IQR) based on the normality of the data. Categorical variables such as gender, residence, comorbidities were summarized as frequency and proportions (%). QOL scores for each of the four domains across the groups (group 1 and group 2) were compared using independent t-test. Association of socio-demographic variables with WHOQOL-BREF domains across the groups were determined using independent t-test. A $p<0.05$ was considered statistically significant.

RESULTS

Out of a total of 1162 participants, majority were males (52.4%) and belonged to age category ≥30 years (84.8%). Most of them were graduates (21%) and they resided in rural areas. Around 671 participants (57.7%) had post-COVID symptoms after 6 months and 502 (43.2%) participants have associated co-morbidities of which type-2 diabetes mellitus (26.7%) and hypertension (25.3%) have major contribution.

Table 1 shows the mean (SD) scores for each domain of WHOQOL-BREF. The highest and lowest mean scores were observed in social domain (71.7) and physical domain (58) respectively.

Table 2 compares the mean QOL scores across the four domains of the WHOQOL-BREF between the two groups of COVID-19 patients. Group 1 consists of patients with moderate to severe COVID-19, while Group 2 includes those with mild or asymptomatic cases. The mean QOL scores of patients with moderate to severe COVID-19 cases (Group 1) were lower in physical (56.9 vs. 58.9, $p<0.001$), psychological (62.6 vs.65, $p<0.001$), social (71.1 vs. 72.2, $p<0.001$) and environmental (65.5 vs. 68.0, $p<0.001$) domains when compared with mild or asymptomatic COVID-19 cases. In all four domains the highest and lowest score belongs to social relationship and physical domain, respectively.

Table 3 compares the QOL scores in the four domains of the WHOQOL-BREF between participants self-reporting post-COVID symptoms and those without. The mean QOL scores of patients among persons with post COVID were lower in physical (56.7 vs. 59.7, $p<0.001$), psychological (62.6 vs.65.5, $p<0.001$), social (71.5 vs. 71.9) and environmental (65.5 vs.68.5, $p<0.001$) domains when compared with persons without post COVID. Highest and lowest scores are observed in social relationship and physical domain in both groups, respectively.

The mean scores of four domains of the WHOQOL-BREF according to the socio-demographic parameters are depicted in Table 4. There is no significant difference in QOL based on gender, type of family and income status of the family in this study. With regards to occupation, skilled workers observed poor QOL in all domains when compared to unskilled workers ($p<0.001$).

Patients living in rural areas showed poorer QOL in all domains ($p<0.001$) in comparison to urban area patients. Similarly, patients <30 years, observed statistically significant worsening in all domains ($p<0.001$) in comparison to those ≥30 years of age. Patients with co-morbidities showed statistically significant worsening of QOL in all domains except social domain as compared to those without co-morbidities.

Table 1: Scores of WHOQOL-BREF across domains among patients treated previously for COVID-19 in a tertiary care centre, Puducherry, (n=1162).

Item/ Domain	Mean (SD)*
Overall QOL	65 (7.1)
Domain 1: Physical	58 (8.2)
Domain 2: Psychological	63.9 (7.4)
Domain 3: Social	71.7 (9.2)
Domain 4: Environmental	66.8 (7.9)

*Higher the WHOQOL-BREF scores, better is the QOL.

Table 2: QOL scores in different domains based on severity of disease among patients treated previously for COVID-19 in a tertiary care centre, Puducherry, (n=1162).

Domains	Group 1, mean±SD, (n=581)	Group 2, mean±SD, (n=581)	P value*
Domain 1-Physical	56.9±8.2	58.9±7.9	<0.001
Domain 2-Psychological	62.6±7.7	65.0±6.9	<0.001
Domain 3-Social	71.1±9.7	72.2±8.6	0.04
Domain 4-Environmental	65.5±8.3	68.0±7.1	<0.001

*Using independent t-test

Table 3: QOL scores in different domains based on the presence of post-COVID symptoms among patients previously treated for COVID-19 in a tertiary care centre, Puducherry, (n=1162).

Domains	Persons with post COVID, Mean±SD, (n=671)	Persons without post COVID, mean±SD, (n=491)	P value*
Domain 1-Physical	56.7±7.3	59.7±8.9	<0.001
Domain 2-Psychological	62.6±6.8	65.5±7.9	<0.001
Domain 3-Social	71.5±8.4	71.9±10.2	0.595
Domain 4-Environmental	65.5±7.3	68.5±8.3	<0.001

*Using independent t-test

Table 4: Association of socio-demographic variables with WHOQOL-BREF domains, (n=1162).

Variables	Physical, mean±SD	Psychological, mean±SD	Social, mean±SD	Environmental, mean±SD
Gender				
Male	58.2±8.32	64.1±7.6	72.2±8.2	67.0±8.0
Female	57.7±7.9	63.5±7.3	70.9±10.2	66.5±7.8
P value*	0.20	0.18	0.35	0.18
Age category (in years)				
>30	61.2±9	67.0±7.9	72.6±8.7	70.2±7.9
≤30	57.4±7.9	63.3±7.2	71.5±9.3	66.2±7.7
P value*	<0.001	<0.001	0.122	<0.001
Residence				
Urban	59.6±8.4	65.7±6.8	73.2±7.6	68.8±6.8
Rural	56.5±7.5	62.3±7.5	70.3±10.1	65.0±8.2
P value*	<0.001	<0.001	<0.001	<0.001
Occupation				
Skilled worker	57.2±8.3	63.1±7.7	71.1±9.8	65.9±8.2
Unskilled worker	59.5±7.5	65.5±6.3	72.9±7.3	68.5±6.9
P value*	<0.001	<0.001	<0.001	<0.001
Type of family				
Nuclear family	58.1±8.1	64.1±7.5	71.8±9.1	67.1±7.9
Joint family	56.8±8.1	62.6±6.9	71.1±10	65.5±7.2
P value*	0.411	0.26	0.51	0.23
Income category (INR)				
7008 and above	57.9±8.1	63.8±7.4	71.6±9.3	66.7±7.9
<7007	58.2±9.1	64.5±7.6	72.3±9.2	67.9±7.4
P value*	0.867	0.60	0.65	0.35
Co-morbidities				
Present	56.7±7.7	62.7±7.3	71±10	65.6±7.8
Absent	59±8.3	64.8±7.5	72.1±8.5	67.7±7.9
P value*	<0.001	<0.001	0.04	<0.001

*Using independent t-test

DISCUSSION

The unprecedented damage produced by the COVID-19 epidemic had endangered millions of lives and caused major disruption to the financial system. Those who became infected with COVID-19 had to endure the most agonizing ordeals. This study analyzed the determinants of HRQoL in COVID-19 patients using the WHO-BREF scale.

The current study found that severity of COVID-19 has an impact on the QOL of the people even in the post-COVID period. This lower HRQOL may be attributable to the hospital admission of the patients with moderate and severe COVID-19 patients as the two groups are otherwise comparable and the findings are in line with the findings of previous studies.[13] The consistent pattern of lower scores in the physical domain and relatively higher scores in the social domain across both groups indicates that, while physical manifestations of COVID and post-COVID symptoms have an important effect on QOL, social support systems may provide degree of resilience.

The study found that people with post-COVID reported lower scores in the physical domain of the WHOQOL-BREF (56.7±7.3), indicating a decline in their physical

well-being, which is consistent with the findings of Bota et al where symptomatic individuals also had reduced scores in the physical domain (58.8±15.8).[12] Similarly, in the psychological domain, post-COVID individuals in this study scored lower (62.6±6.8) compared to those without symptoms, though slightly higher than in the referenced study (56.3±16.4). A major difference was observed in the social domain, where participants with post-COVID in this study reported significantly higher scores (71.5±8.4) compared to the much lower scores in the referenced study (50.2±17.5), possibly due to contextual or population differences affecting social well-being. Demographic and sociocultural variations, such as differences in age, gender, socioeconomic status, and social support systems, may be attributed to higher domain scores. Healthcare access and recovery support could also play a role, as better access to medical care and mental health services might contribute to improved psychological well-being. Additionally, differences in study design and the timing of QOL assessments may have influenced results, with participants in the current study potentially being assessed later in their recovery phase, leading to higher scores.

The current study highlighted that the likelihood of achieving a high QOL score increases with age, contrary to some previous studies. Specifically, individuals aged over 30 years had higher QOL scores across all domains compared to those aged 30 years and below. This finding diverges from studies such as those by Hawlader et al which reported that older adults often face greater challenges in maintaining physical health and well-being following COVID-19.[13] This difference could be attributed to variations in study populations, regional healthcare infrastructure, or other contextual factors influencing the QOL outcomes.

This study also found that women had lower HRQoL scores than men which was similar to a study by Zozani et al and Chen et al.[14,15] Reason could be that women are more anxious about disease and also take care of family members who are affected by disease. Furthermore, combined economic impact of COVID-19 on women may have had psychological influence on them.

The findings from the study indicate that participants living in urban areas had higher domain scores in all the four domains compared to those living in rural areas. This aligns with the research conducted by Shucksmith et al, Rashid et al and Hawlader et al which suggested that rural communities generally experience a lower QOL compared to urban areas.[13,16,17] The study further suggests that factors such as access to modern amenities and treatments, career growth opportunities, immediate social support, and a favorable environment in urban areas may have contributed to the improved QOL. Understanding the variations in QOL across different geographical areas can help policymakers and healthcare providers identify specific needs. This calls for creating targeted interventions to assist individuals and communities, especially those in rural and semi-urban areas who may be more vulnerable or have limited access to resources.

The study findings illustrated that skilled workers had poor QOL as compared to unskilled workers. Previous studies have highlighted may be attributed to the shift to new work environments and expectations during pandemic.[18] These findings show that organizational support should focus on providing social support during times of crisis and reducing employee emotions of job instability. Furthermore, to improve environmental QOL among employed people, organizations can boost feelings of competence by appreciating their current contributions and willingness to adjust to and accept new work demands, despite the crisis and generalized distress at societal levels during the COVID-19 pandemic.

The study outlined the association between presence of comorbidities and lower QOL scores across physical, psychological and environmental domain similar to a study by Hawlader et al.[13] This association underscores that the presence of comorbidities exacerbates the impact of COVID-19 on overall QOL. This highlights the need for integrated care approaches that address both COVID-19 and chronic diseases to improve patient outcomes and QoL.

The strength of this study is the use of a standardized and validated questionnaire (WHO-BREF Scale) to measure QOL of participants and allows us to compare our findings to those of other studies. The use of probability sampling from the line-list of patients from hospital records ensures the internal validity of the study by eliminating selection bias. Quality of data collection and data analysis was ensured on regular basis to ensure validity of the study. A few limitations of our study are the nature of self-reporting of the QOL by the participants which are prone to result in social desirability bias as participants may overestimate or underestimate their QOL. As data collection is done by field workers, interviewer bias of assessing the outcome was a potential problem which was addressed by providing adequate training to data collectors and standardization of the data collection process. Also, since QOL depends on multiple factors and changes from time to time, it was difficult to make a causal inference on the association due to the cross-sectional nature of the study. The study involved participants line-listed from a tertiary care centre and hence might not be representative of the general population limiting its generalizability. Despite these limitations, this study provides preliminary evidence of the association between post-COVID and QOL and future research is recommended to gain deeper insights into other factors affecting QOL with more objective tools of QOL measurement.

CONCLUSION

This study highlighted that HRQoL among post-covid patients depend on variable interaction between the

disease severity and socio-demographic factors. Our study identified that skilled workers, individuals above 30 years, those residing in rural areas and those having underlying comorbidities experienced poorer QOL across domains. These findings underscore the need for interventions such as post COVID-19 clinics and Counselling centres. The study also stresses on the importance of providing access to professional counselling services, support groups, and resources to cope with the psychological and socio-economic impact of the disease. Implementing these initiatives will facilitate holistic recovery, enhance QOL, and contribute to more supportive and inclusive healthcare system.

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REFERENCES

1. Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges. Int J Antimicrob Agents. 2020;55(3):105924.
2. Zheng KI, Gao F, Wang XB, Sun QF, Pan KH, Wang TY, et al. Extrapulmonary complications of COVID-19: a multisystem disease? J Med Virol. 2021;93(1):66-74.
3. da Rosa Mesquita R, Francelino Silva Junior LC, Santos Santana FM, Farias de Oliveira T, Campos Alcântara R, Monteiro Arnozo G, et al. Clinical manifestations of COVID-19 in the general population: systematic review. Wien Klin Wochenschr. 2021;133(7-8):377-82.
4. Ding Y, Yan H, Guo W. Clinical characteristics of children with COVID-19: a meta-analysis. Front Pediatr. 2020;8:431.
5. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. JAMA. 2020;323(11):1061-9.
6. Huynh G, Nguyen BT, Nguyen HTN, Le NT, An PL, Tran TD. Health-related quality of life among patients recovered from COVID-19. Inquiry. 2022;59:469580221143630.
7. Elumalai R, Bagepally BS, Ponnaiah M, Bhatnagar T, Barani S, Kannan P, et al. Health-related quality of life and associated factors among COVID-19 individuals managed with Indian traditional medicine: a cross-sectional study from South India. Clin Epidemiol Glob Health. 2023;20:101250.
8. World Health Organization. WHOQOL-BREF: introduction, administration, scoring and generic version of the assessment. Geneva: World Health Organization; 1996.
9. Nandasena HMRKG, Pathirathna ML, Atapattu AMMP, Prasanga PTS. Quality of life of COVID-19 patients after discharge: systematic review. PLoS One. 2022;17(2):e0263941.
10. Savarimuthu Rogina JS, Preetha A, Petrishya D, Princy, Praveen L, Kumar MP, Iswariya M. Quality of life amongst general public during COVID-19 lockdown, Tamil Nadu, India. Indian J Contemp Nurs. 2021;22(1):93-5.
11. World Health Organization. WHOQOL-BREF: World Health Organization quality of life instruments. Geneva: World Health Organization. 2020.
12. Bota AV, Bratosin F, Bogdan I, Septimiu-Radu S, Ilie AC, Burtic SR, et al. Assessing the quality of life, coping strategies, anxiety and depression levels in patients with long-COVID-19 syndrome: a six-month follow-up study. Diseases. 2024;12(1):21.
13. Hawlader MDH, Rashid MU, Khan MAS, Ara T, Nabi MH, Haque MMA, et al. Quality of life of COVID-19 recovered patients in Bangladesh. PLoS One. 2021;16(10):e0257421.
14. Arab-Zozani M, Hashemi F, Safari H, Yousefi M, Ameri H. Health-related quality of life and its associated factors in COVID-19 patients. Osong Public Health Res Perspect. 2020;11(5):296-302.
15. Chen KY, Li T, Gong FH, Zhang JS, Li XK. Predictors of health-related quality of life and influencing factors for COVID-19 patients: a follow-up at one month. Front Psychiatry. 2020;11:668.
16. Shucksmith M, Cameron S, Merridew T, Pichler F. Urban–rural differences in quality of life across the European Union. Reg Stud. 2009;43(10):1275-89.
17. Rashid MU, Khan MAS, Dalal K, Sagar SK, Hossain M, Barsha SY, et al. Quality of life among COVID-19-recovered healthcare workers in Bangladesh. BMC Health Serv Res. 2022;22:716.
18. Kliestik T, Valaskova K, Dabija DC. Remote work burnout during the COVID-19 pandemic. Front Psychol. 2024;15:1389984.

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