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Health-Related Quality of Life in Patients with COVID-19 in Indonesia: A Cross-Sectional Study

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Abstract: Evidence on health-related quality of life (HRQoL) among hospitalized COVID-19 patients in Indonesia remains limited, particularly during the acute phase of infection. This study aimed to describe HRQoL and its associated sociodemographic and clinical factors among hospitalized COVID-19 patients in Indonesia. A cross-sectional study was conducted among adult patients with polymerase chain reaction confirmed COVID-19 who were hospitalized at Rumah Sakit Darurat COVID-19 (RSDC) Wisma Atlet, Jakarta, between October - December 2021. HRQoL was assessed using the validated Bahasa Indonesia version of the EQ-5D-5L questionnaire, including the utility index derived from the Indonesian value set and the EQ visual analogue scale (EQ-VAS). Descriptive statistics were used to summarize HRQoL distributions, and group differences were analyzed using the Mann–Whitney U test and Kruskal–Wallis test. A total of 154 patients were included in the analysis. The mean EQ-5D-5L utility index was 0.762 (SD 0.23; 95% CI: 0.726–0.798), and the mean EQ-VAS score was 75.00 (SD 15.81; 95% CI: 72.48–77.52). Utility index values ranged from 0.311 to 1.000, with 31.17% of participants reporting full health. Among the EQ-5D-5L dimensions, anxiety/depression was the most frequently reported problem (68.83%). Statistically significant differences in utility index scores were observed across sex, age groups, and occupational status ($p < 0.05$). In conclusion, hospitalized COVID-19 patients in Indonesia reported moderately high overall HRQoL, while psychological problems particularly anxiety and depression were highly prevalent. These findings highlight the importance of integrating mental health support into inpatient care and recovery services.

Introduction

Since early 2020, Coronavirus Disease 2019 (COVID-19) has posed a major global public health challenge, affecting not only physical health but also psychological well-being and social functioning. In Indonesia, the first confirmed cases were reported in March 2020, followed by a rapid increase in infections that placed substantial pressure on the healthcare system. Beyond morbidity and mortality, the pandemic has generated wide-ranging consequences for patients' daily functioning, mental health, and perceived quality of life (1, 2).

Health-related quality of life (HRQoL) is a multidimensional construct that reflects individuals' perceptions of their physical, psychological, and social health status (3). Instruments such as the EuroQol 5-Dimension 5-Level (EQ-5D-5L) questionnaire have been widely used to quantify HRQoL across disease conditions and populations, including during the COVID-19 pandemic (4, 5). By 2021–2022, a growing body of international literature had documented reductions in HRQoL among COVID-19 patients, particularly in domains related to anxiety/depression, pain/discomfort, and limitations in usual activities (5, 6). These studies have demonstrated that HRQoL assessment provides complementary information to clinical indicators by capturing patient-reported outcomes that are not reflected in routine biomedical measures.

Despite the expanding global evidence base, data on HRQoL among COVID-19 patients in Indonesia remain limited. Most available studies have focused on epidemiological characteristics, clinical outcomes, or mortality, with relatively little attention to patient-reported quality of life, especially among hospitalized populations. Furthermore, Indonesian-specific HRQoL data are essential because HRQoL values are influenced by cultural context, healthcare systems, disease management strategies, and country-specific value sets used to generate utility scores. Therefore, findings from other countries cannot be directly extrapolated to the Indonesian context (4, 7).

COVID-19 has also been consistently associated with adverse mental health outcomes, including anxiety, depression, post-traumatic stress symptoms, and sleep disturbances (8, 9). These psychological sequelae align closely with the anxiety/depression dimension of the

EQ-5D-5L and are known to substantially influence overall HRQoL. Understanding how frequently these problems are reported among hospitalized COVID-19 patients may help identify priority areas for integrated mental and physical healthcare interventions during and after hospitalization.

Rumah Sakit Darurat COVID-19 (RSDC) Wisma Atlet in Jakarta was established as a national referral center to manage a large volume of COVID-19 cases from diverse sociodemographic backgrounds. As one of the largest dedicated COVID-19 facilities in Indonesia, RSDC Wisma Atlet provides a unique and relevant setting for assessing HRQoL among hospitalized patients during the pandemic. Data from this setting can offer valuable insights into patient-reported outcomes within a real-world, high-burden healthcare environment.

Therefore, this study aimed to describe health-related quality of life and its associated sociodemographic and clinical factors among hospitalized COVID-19 patients in Indonesia using the EQ-5D-5L instrument. By focusing on patient-reported outcomes rather than causal inference, this study seeks to contribute baseline HRQoL evidence that may inform clinical care, psychosocial support strategies, and future longitudinal research in the Indonesian context.

Materials and Methods

Study design and participants

This study employed a cross-sectional design (10). Participants were adult patients (aged 18–65 years) with laboratory-confirmed COVID-19 based on positive polymerase chain reaction (PCR) test results who were hospitalized and isolated at Rumah Sakit Darurat COVID-19 (RSDC) Wisma Atlet, Jakarta, Indonesia, between October and December 2021.

A consecutive sampling approach was applied, whereby all eligible patients admitted during the study period were invited to participate. Inclusion criteria were: (1) confirmed COVID-19 diagnosis, (2) hospitalization at RSDC Wisma Atlet during the study period, and (3) ability and willingness to provide informed consent and complete the questionnaire.

Data sources and data quality control

Primary data were obtained through face-to-face interviews using the EQ-5D-5L questionnaire. Secondary data, including age, sex, symptoms, and comorbidities, were extracted from patients' medical records. To ensure data quality, questionnaire responses were cross-checked against medical records using unique patient identifiers. Medical records were reviewed for completeness and internal consistency prior to data entry. Any discrepancies or incomplete entries were verified and resolved where possible.

Handling of missing data

Of the 176 patients initially eligible, 22 were excluded due to refusal to participate, withdrawal, or incomplete questionnaire responses. Only participants with complete EQ-5D-5L descriptive system data and EQ-VAS scores were included in the final analysis (n = 154). As the proportion of missing data was low and missingness primarily resulted from non-completion of questionnaires, a complete-case analysis was performed. No data imputation was conducted.

EQ-5D-5L instrument and categorization

HRQoL was assessed using the validated Bahasa Indonesia version of the EQ-5D-5L questionnaire (5, 7). The descriptive system consists of five dimensions mobility, self-care, usual activities, pain/discomfort, and anxiety/depression each with five response levels ranging from "no problems" (level 1) to "extreme problems" (level 5) (11).

For descriptive and comparative analyses, responses were dichotomized into "no problem" (level 1) and "has problem" (levels 2–5) for each dimension. This categorization was used to facilitate clinical interpretability and comparability with previous studies adopting similar approaches. We acknowledge that dichotomization may result in some loss of information; therefore, full five-level distributions are also presented to preserve transparency.

Health state codes were converted into utility index values using the Indonesian EQ-5D-5L value set (7). The EQ visual analogue scale (EQ-VAS), ranging from 0 to 100, was used to capture patients' self-rated overall health.

Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows, version 24.0 (IBM Corp., Armonk, NY, USA). An overview of the distribution of frequencies and proportions of the researched variables, such as gender, age, level of education, general symptoms, and comorbidities, was obtained using descriptive analysis. Before bivariate analysis, the Kolmogorov-Smirnov and the Levene tests were administered to determine the normality and homogeneity of the data, respectively. The data did not exhibit a normal distribution, and Mann-Whitney U test was used to assess gender and occupation mean differences. Furthermore, Kruskal-Wallis was used to assess differences in mean age, degree of education, general symptoms, and comorbidities, with a significance set at $p < 0.05$ (12).

Results

Participant recruitment

A total of 154 patients were included in the final analysis. The participant recruitment and exclusion process is presented in **Figure 1**. The final sample reflects patients who met all eligibility criteria and provided complete data required for the assessment of health-related quality of life, ensuring the reliability of the descriptive and comparative analyses conducted in this study and study validity.

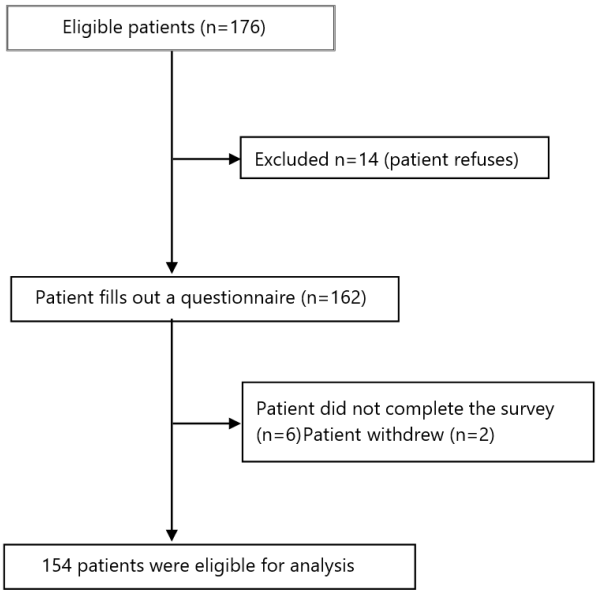

Figure 1. Flow chart of the participant recruitment process

Table 1. Socio-demographic characteristics and the EQ-5D-5L index value (n=154).

Characteristics	n=154 (%)	Mean EQ-5D-5L Index (SD)	p-*value*
Gender			
Male	96 (62.34)	0.812 (0.21)	< 0.001*
Female	58 (37.66)	0.679 (0.23)	
Age (mean 53.71±12.60) years			
20-39	41 (26.62)	0.831 (0.21)	< 0.001**
40-59	78 (50.65)	0.817 (0.20)	
60-79	35 (22.73)	0.777 (0.23)	
Occupation			
Working	130 (84.42)	0.771 (0.23)	< 0.001*
Not working/retired	24 (15.58)	0.716 (0.21)	
Level of education			
Elementary school	15 (9.74)	0.771 (0.28)	0.800**
Junior high school	33 (21.43)	0.727 (0.24)	
Senior high school	57 (37.01)	0.771 (0.20)	
University	49 (31.82)	0.773 (0.23)	
Common symptoms that are felt			
Fatigue	13 (8.44)	0.684 (0.28)	0.850**
Cough	41 (26.62)	0.771 (0.21)	
Diarrhea	17 (11.04)	0.763 (0.20)	
Anosmia	28 (18.18)	0.741 (0.25)	
Fever	55 (35.72)	0.784 (0.22)	
Comorbidities			
Hypertension	41 (26.62)	0.768 (0.23)	0.680**
Diabetes	45 (29.22)	0.729 (0.23)	
Cholesterol	10 (6.49)	0.786 (0.23)	
No comorbidities	58 (37.67)	0.779 (0.22)	

Note: *Mann-Whitney U test; level of significance (p<0.05). **Kruskal-Wallis test; level of significance (p<0.05).

Table 2. EQ-5D-5L frequencies and proportions reported by dimension and level.

Dimensions Level	Mobility n (%)	Self-care n (%)	Usual activities n (%)	Pain/ discomfort n (%)	Anxiety/ depression n (%)
Level 1 (No problem)	122 (79.22)	127 (82.47)	80 (51.95)	135 (87.66)	48 (31.17)
Level 2 (Slight problem)	30 (19.48)	27 (17.53)	36 (23.38)	19 (12.34)	30 (19.48)
Level 3 (Moderate problem)	2 (1.30)	0 (0)	26 (16.88)	0 (0)	33 (21.43)
Level 4 (Severe problem)	0 (0)	0 (0)	12 (7.79)	0 (0)	26 (16.88)
Level 5 (Extreme problem)	0 (0)	0 (0)	0 (0)	0 (0)	17 (11.04)
Total	154 (100)	154 (100)	154 (100)	154 (100)	154 (100)

Univariate analyses

The sociodemographic, clinical characteristic, and EQ-5D-5L index values of the study participants are shown in **Table 1**. The average age was 53.71 years (SD ± 12.60), and 62.34% of participants were male. About 37.01% patients had completed high school, and 84.42% were employed. The prevalence of fever was 35.72%, without comorbidities at 37.67%, larger than characteristics based on general physical symptoms.

Bivariate analysis

Table 1 also contains the findings of a bivariate study of the association between sociodemographic parameters, clinical features, and EQ-5D-5L index scores. Statistically significant differences in mean EQ-5D-5L utility index scores were observed by sex, age group, and occupational status (all $p < 0.001$), whereas no significant differences were found according to education level, general symptoms, or comorbidities ($p > 0.05$) (13). These results are presented descriptively to indicate patterns of association and should not be interpreted as evidence of independent or causal relationships.

EQ-5D-5L frequencies and proportions reported by dimension and level

The distribution of HRQoL problems reported by patients for each of the EQ-5D-5L dimensions can be seen in **Table 2**. The anxiety/depression with the most reported problems

Table 3. EQ-5D index frequency distribution.

EQ-5D index	Frequency n=154	%
1.000	48	31.17
0.921	7	4.54
0.866	15	9.74
0.831	10	6.49
0.776	3	1.95
0.710	15	9.74
0.695	10	6.49
0.683	5	3.25
0.611	6	3.90
0.609	1	0.65
0.565	2	1.30
0.525	7	4.54
0.486	3	1.95
0.472	1	0.65
0.397	2	1.30
0.394	4	2.60
0.371	1	0.65
0.353	4	2.60
0.311	10	6.49

Table 4. EQ-5D-5L VAS frequency distribution.

EQ VAS	Frequency n=154	%
100	19	12.33
99	2	1.30
98	1	0.65
95	2	1.30
90	20	12.98
89	2	1.30
86	1	0.65
85	3	1.95
80	18	11.68
78	3	1.95
77	2	1.30
76	1	0.65
75	6	3.90
70	17	11.04
69	2	1.30
67	1	0.65
66	1	0.65
65	14	9.09
62	1	0.65
60	18	11.69
55	3	1.95
50	17	11.04

occurred in 106 patients at 68.83%, then usual activity, mobility, self-care, and discomfort in 74, 32, 22, and 19 patients at 48.05%, 20.78%, 17.53%, and 12.34%, respectively.

EQ-5D index and EQ-5D-5L VAS frequency

Table 3 shows that the highest and lowest EQ-5D-5L utility index value is 1.000 and 0.311, with a total of 48 and 10 patients at 31.17% and 6.49%, respectively. The overall mean EQ-5D-5L utility index was 0.762 (SD 0.23; 95% CI: 0.726–0.798). **Table 4** shows that the highest EQ-5D-5L VAS value was 100 with 19 patients at 12.33%, and the lowest was 50 with 17 at 11.04%. The overall mean EQ-VAS score was 75.00 (SD 15.81; 95% CI: 72.48–77.52).

Discussion

To our knowledge, this is among the first studies to describe HRQoL among hospitalized COVID-19 patients in a large national referral center in Indonesia. Utility reflects an individual's preference for a given health state under conditions of uncertainty. Utility scores may show preferences for health and the impact of increasing status owing to the effectiveness of an intervention and the associated adverse effects (14). The mean EQ-5D-5L utility index of 0.762 (SD 0.23; 95% CI: 0.726–0.798) was higher than figures reported in several international general population norms (e.g., England 0.714 (15), Norway 0.690 (16), Belgium 0.620 (17), Iran 0.612 (18)). However, when contextualised among patients who have had COVID-19, our result remains meaningful. A large recent meta-analysis found a pooled mean utility index of approximately 0.76 (95 % CI 0.74–0.79) among COVID-19 patient cohorts (19). For example, in a study of 694 Chinese COVID-19 patients, the mean utility index during acute infection was 0.58 (± 0.33) and improved to 0.92 (± 0.14) post-infection (20). Another study of ICU survivors of COVID-19 reported a mean utility index of 0.51 (± 0.43) (21). Health-related quality of life among COVID-19 populations can vary widely, influenced by disease severity, recovery stage, comorbidities, and timing of follow-up. In our study, the observed utility score of 0.762 suggests that participants who were likely less severely affected or further along in their recovery reported relatively high quality of life, in some cases approaching or even exceeding global COVID-19 averages and nearing general population norms. This relatively high score may reflect a combination of factors, including a younger or healthier sample, effective local healthcare and recovery support, and cultural or healthcare system influences on self-perceived health. Nonetheless, these findings should be interpreted with caution, as differences in sampling, disease severity, follow-up duration, and country-specific value sets can all impact utility scores.

The visual analog scale, or VAS, provides a choice of numbers to determine a person's health status, and the questions that can be used are "How is the quality of your life currently?" This assessment uses a scale of 0 to 100, where 100 and 0 are the best and worst health imaginable for patients (22). In our study, the mean EQ-VAS score was 75.00 (SD 15.81; 95% CI: 72.48–77.52), suggesting that participants likely less severely affected or further along in recovery reported relatively high HRQoL . By comparison, healthy volunteers in the UK had a mean EQ-VAS of 82.75, indicating that COVID-19 may still leave a modest impact on quality of life (15). Factors such as younger age, better baseline health, effective local healthcare support, or cultural influences on self-perceived health may contribute to these

relatively high scores. Nonetheless, interpretation should be cautious, and future studies should stratify patients by severity and recovery stage, and compare to pre-infection baseline values to more accurately assess the impact of COVID-19 on HRQoL.

Among the five EQ-5D-5L dimensions, anxiety/depression emerged as the most frequently reported problem. This finding is consistent with global evidence demonstrating a substantial psychological burden among COVID-19 patients (23, 24). Although specific psychiatric diagnoses or symptom severity were not assessed, the high prevalence of anxiety/depression responses indicates that mental health concerns constitute a central component of HRQoL during hospitalization. These results underscore the importance of incorporating psychological screening and supportive interventions into inpatient COVID-19 care, while recognizing that further research is required to evaluate the effectiveness of such approaches.

Differences in HRQoL were observed across sex, age groups, and occupational status. These associations should be interpreted cautiously, as they may be influenced by unmeasured factors such as baseline health status, caregiving roles, or pre-existing psychological conditions. Similarly, observed differences by occupational status may reflect broader socioeconomic or contextual influences that were not directly measured in this study. Consequently, no specific causal mechanisms are inferred from these findings (25, 22).

Patients with comorbidities, particularly diabetes mellitus, tended to report lower utility scores. However, these observations were based on unadjusted, bivariate analyses and should be considered descriptive. The absence of multivariable modeling limits the ability to determine independent associations between comorbidities and HRQoL, as multiple sociodemographic and clinical factors may act as confounders. Future studies employing multivariable or longitudinal designs are needed to better elucidate these relationships (22).

Several limitations should be acknowledged. First, the cross-sectional design precludes causal inference and does not capture changes in HRQoL over time. Second, the single-center setting may limit generalizability to other healthcare contexts or to non-hospitalized patients. Third, HRQoL assessment relied on self-reported measures, which may be subject to recall or reporting bias (10, 26). Finally, the absence of a control group or pre-infection baseline data restricts the ability to quantify the specific impact of COVID-19 on HRQoL.

Despite these limitations, this study contributes important baseline evidence on HRQoL among hospitalized COVID-19 patients in Indonesia. The findings highlight the value of patient-reported outcomes in understanding the broader burden of COVID-19 and emphasize mental health as a key domain requiring attention in both clinical practice and future research.

Conclusion

This study provides descriptive evidence on health-related quality of life among hospitalized COVID-19 patients in Indonesia. Although overall HRQoL, as measured by the EQ-5D-5L utility index and EQ-VAS, was moderately high, problems related to anxiety and depression were highly prevalent. These findings indicate that psychological well-being is a central component of HRQoL among hospitalized patients and warrants attention alongside physical recovery.

From a policy perspective, the results underscore the importance of integrating mental health services into inpatient and post-discharge COVID-19 care in Indonesia. Routine HRQoL assessment using standardized instruments such as the EQ-5D-5L may facilitate early identification of psychological distress and support targeted interventions at both facility and health system levels. Incorporating patient-reported outcome measures into hospital reporting systems could also strengthen service monitoring and quality evaluation during public health emergencies.

At the national level, HRQoL data derived from validated, country-specific value sets can complement existing clinical and epidemiological indicators. Such data may inform resource allocation, rehabilitation planning, and the development of comprehensive recovery guidelines that address both mental and physical health needs.

Given the cross-sectional design and single-center setting, future research should adopt longitudinal and multicenter designs to examine changes in HRQoL over time and to identify independent determinants using multivariable analyses. Prospective studies incorporating non-infected comparators or pre-infection baseline data would further strengthen the evidence base for clinical decision-making and policy formulation in Indonesia.

Declarations

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Conflict of Interest

The authors declare no conflicting interest.

Data Availability

The data generated during and/or analyzed during the current study are available from the corresponding author on

reasonable request.

Ethics Statement

This study was approved by the Ethics Committee for Health Research, Faculty of Medicine, Hasanuddin University (Reference Number: 675/UN4.6.4.5.31/PP36/2021) and the RSDC Ethics Committee at Wisma Atlet Kemayoran (Reference Number: 025/KERSDCWA/2021) for research ethics.

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Additional Information

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