Health-Related Quality of Life Assessment of COVID-19 Patients: A Hospital-Based Study

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Abstract.

*Covid-19 causes various symptoms in patients, ranging from manifestationsdiseasemild to severe illness andevendeath. This study assessed quality of life (the health-related quality of life/HRQOL)relatedhealthCovid-19 patientswithusing primary data from confirmed cases inCentral HospitalEthiopia South.This study used a facility-based cross-sectional study design and conducted the study at the Covid-19 treatment center of Bokoji Hospital. A structured questionnaire and the EQ-5D-3L scale were used to collect data for analysis. HRQOL results measured by the EQ-5D-3L tool were converted into health status utilities. (HSU) usestariff service**Zimbabwe**. The mean health utility index and HSU visual analogue scale across various sociodemographic and clinical characteristics were compared using the Mann–Whitney U test or the Kruskal–Wallis test. Done Multiple linear regression was used to examine factors associated with HSU scores simultaneously. Data were analyzed using STATA version 15.The overall mean HSU score of the EQ-5D was 0.688 (SD: 0.285), and the median was 0.787 (IQR 0.596, 0.833). The mean HSU score of the visual analog scale was 0.69 (SD: 0.129), with a median of 0.70 (IQR 0.60, 0.80).Patientthose receiving dexamethasone and intranasal oxygen supplements, those with comorbidities, those aged over 55 years and those hospitalized for more than 15 days had significantly lower HSU scores thanother patients($p<.001$). COVID-19 has substantially impaired the HRQOL of patients in Ethiopia, particularly among the elderly and those with comorbidities. Therefore, clinical follow-up and psychological care should be encouraged for these groups.*

Keywords: *Quality of life; HRQOL and Covid-19.*

I. INTRODUCTION

Coronavirus disease 2019 (Covid-19) was first discovered in Wuhan Province, China in December 2019. According to the World Health Organization (WHO) (April 20, 2021), more than 140 million cases and more than 3 million deaths worldwide are caused by Covid-19.[1] In Ethiopia, the first case of Covid-19 was reported on March 13, 2020. The Ethiopian Ministry of Health report states that more than 240,000 cases and 3,370 deaths have been reported.[1] This pandemic has caused various health, social, and economic crises at the macro and micro levels.[2] The wide range of symptoms of Covid-19 ranges from mild to severe manifestations of the disease to death.Some people may have this disease without experiencing any symptoms. The most common symptoms are upper respiratory tract symptoms (sore throat, cold symptoms, mild cough), muscle aches, and a general feeling of being unwell. In some cases, abdominal pain and diarrhea have occurred, and loss of taste and smell has also been reported. Some patients may experience pneumonia with respiratory distress.Severe shortness of breath, cough, and fever may require admission to an intensive care unit. Lung examination usually reveals changes consistent with viral pneumonia. Mortality is commonhisoccurs in older people, especially in older adultswhich hasunderlying diseaser, but death can also occur in people without known risk factors..[3'4]

Health-related quality of life (HRQOL), an important health care indicator for all types of diseases,[5]measuring the welfare of pThe overall physical, mental, and emotional state of a patient at a specific point in time. It can be used to evaluate disease severity, treatment outcomes, patient satisfaction with care, quality of care, overall patient well-being, and target costs and benefits of disease interventions.[5-8] However, because Covid-19 is a new disease, little is known about its impact on HRQOL. In Italy, a retrospective analysis of HRQOL using the SF-36 and involving 673 cases one month after discharge from

San Salvatore Hospital in Pesaro found that Covid-19 caused a substantial decline in patients' physical and mental health. The study showed that the role of physical and emotional well-being, vitality, andsocial function is a dimension that is greatly affected.[8]A retrospective study in China showed that Covid-19 had a substantial impact on the physical and psychological dimensions of HRQOL..[1°]

Another multicenter follow-up study from China showed that Covid-19 had a substantial impact on HRQOL, with some effectsWhichsurviving more than three months after discharge from hospital.[11] An HRQOL study using the EQ-5D in a multi-ethnic Asian population in Singapore among patients with Covid-19 and cardiovascular comorbidities showed that the mental health dimension of patient well-being was the most affected area..[12] An HRQOL study from Iran using EQ-5D reported very low HRQOL scores among Covid-19 patients (0.6125) and showed that socioeconomic factors (i.e., gender, age, educational status, employment status) and comorbidity status (i.e., having diabetes or cardiovascular disease) were significant predictors of HRQOL scores.[13] The impact of Covid-19 on HRQOL varies from country to country due to socioeconomic factors, treatment modalities offered (and their outcomes), and variations in disease severity and epidemiology..[6]However, while local evidence on the impact of Covid-19 on HRQOL is important for informing the design of national and regional Covid-19 treatment protocols, the impact of the disease on HRQOL in the Ethiopian or African context is unknown. Therefore, this study assessed the impact of Covid-19 and associated factors on HRQOL using primary data from confirmed cases at a Covid-19 treatment center in South Central Ethiopia.

II. METHODS

Covid-19 causes a wide range of symptoms in patients, ranging from mild manifestations to severe illness and even death. This study assessed quality of life (the health-related quality of life/HRQOL) related to the health of Covid-19 patients using primary data from confirmed cases at the South Ethiopia Central Hospital.The location, design, and population of this study used a descriptive research design.facility-based cross-sectional.Pthis researchdonein the Arsi Zone at the Bokoji Hospital Covid-19 treatment center, one of the largest Covid-19 treatment centers inCentral Hospital in Southern Ethiopia, which provides services to communities from 28 districts and two city administrations. The sample size was determined using a single population formula with an assumed type I error of 0.05, a 95% confidence interval, a proportion of good HRQOL (50%), and non--10% response rate. The final calculated sample size was 422, and since all discharged patients met the criteria below, all discharged Covid-19 patients were recruited for this study. The study population was all Covid-19 patients discharged from the treatment center between July 1, 2020, and March 20, 2021. All Covid-19 patients discharged from treatment centersincludingafter recovery or with consent for home care. Excluding allCovid-19 patients who were referred to other treatment center hospitals, had incomplete medical records or died, 398 confirmed Covid-19 cases were included in the analysis.

Data Collection and Tools.

To measure HRQOL in Covid-19 patients, a visual analog scale (VAS) was used along with the EQ-5D-3L questionnaire, which is the most common instrument for assessing HRQOL. The EQ-5D-3L includes five dimensions (mobility, self-care, usual activities, pain/discomfort, anxiety/depression), each with three levels to determine possible health status (no problems, some problems, disability/extreme problems). The VAS is a graduated vertical line (0–100) indicating the respondent's overall health status, with 0 being the worst imaginable health condition and 100 being the best imaginable health condition. Four healthcare professionals collected data after two days of training on data collection procedures and tools. Data collection was conducted using face-to-face interviews. Additionally, information on sociodemographic and clinical characteristics was obtained from patient medical records. The first author (AK) supervised data collection.

Research Variables and Operational Definitions

Health status utility (HSU) was the dependent variable. In contrast, sociodemographic variables, such as age, sex, marital status, residence, and clinical variables such as general health status at admission, chronic diseases, dexamethasone treatment, use of intranasal oxygen, and average length of stay were independent variables. Patients' general health status was defined as asymptomatic, mild, moderate, severe,

or critically ill, according to the WHO and Ethiopian national diagnosis and treatment protocols. 'Asymptomatic infection' was defined as the absence of clinical signs and symptoms with a positive nucleic acid test, while 'COVID-19 disease' was defined as the absence of clinical signs and symptoms with a positive nucleic acid test.Mild disease is defined as the presence of mild clinical signs and symptoms without respiratory distress and the absence of imaging manifestations of pneumonia. Moderate disease is defined as the presence of clinical signs of pneumonia (fever, cough, dyspnea, and rapid breathing) but without symptoms of severe pneumonia, including SpO2≥90% on room air. Severe disease is defined as the presence of at least one of three conditions: respiratory distress, respiratory rate ≥30 beats/minute; oxygen saturation at rest ≤90%; or arterial blood oxygen partial pressure/oxygen concentration≤200 mmHg. Critical illness is defined as respiratory failure requiring mechanical ventilation, shock, or combined organ failure requiring intensive care unit (ICU).[14’15]

Table 1. Demographic and clinical characteristics of Covid-19 patients treated at treatment centers in the Arsi Zone, 2020–2021

CharacteristicsDdemographics andKlinear	Frequency (%)
Gender	
- Woman	159 (40.0)
- Man	239 (60.0)
Age (mean =41.5 (SD: 18.8)	
0–24 years	83 (20.9)
25–34	102 (25.6)
35–44	52 (13.1)
45–54	46 (11.6)
55 years and above	115 (28.9)
PlaceTstay	
Rural	156 (39.0)
Urban	242 (61.0)
Health Status Login	
Asymptomatic	95 (23.9)
Light	93 (23.4)
Currently	80 920.00
Critical	130 (32.7)
Comorbidities	
Yes	179 (45.9)
No	219 (55.0)
Types of Comorbidities	
Diabetes mellitus	68 (17.1)
Hypertension	41 (10.3)
Asthma	33 (8.3)
Chronic lung disease	30 (7.5)
Chronic heart disease	23 (5.8)
Malignancy	11 (2.8)
Chronic kidney disease	7 (1.8)
HIV/AIDS	6 (1.5)
Types of Antibiotics Given	
Aziromycin only	148 (37.2)
Azithromycin + Ceftriaxone	131 (32.9)
Azithromycin + Vancomycin + Ceftazidine	50 (12.6)
Azithromycin + Ceftriaxone + Metronidazole	30 (7.5)
Azithromycin + Ceftazidime + Amoxicillin	13 (3.3)
Azithromycin + Ceftriaxone + Ceftazidine	2 (0.5)
Use of Dexamethasone	
Yes	116 (29.1)
No	282 (70.9)
Use of Intranasal Oxygen	
Yes	162 (59.3)
No	236 (40.7)
Length of Hospital Stay (mean = 14.3, SD : 4.8)	

1-7 days	12 (3.0)
8 - 14 days	248 (61.8)
15 - 21 days	113 (28.4)
22 - 28 days	13 (3.3)
More than 28 days	14 (5.5)

Health status when discharged is cured, transferred or sent home with approval. Recovered is defined as a Covid-19 patient who was discharged after two negative laboratory findings confirmed. Discharged with consent is defined as Covid-19 patients who were discharged with consent after one their laboratory results were positive after at least 14 days of stay in the care center. Similarly, transfer is defined as Covid-19 patients who were transferred to other treatment centers for further management of Covid-19 or complications due to underlying disease.

Data analysis

HRQOL results measured by the EQ-5D-3L were converted to health status utilities (HSUs) using Zimbabwean tariff units, while VAS scores were directly taken as another HSU (HSU-VAS).[16] Both the HUI from the EQ-5D-3L and the overall HSU-VAS from the VAS scores were analyzed as continuous variables. The authors used frequencies and percentages to summarize the sociodemographic and clinical characteristics of the participants and summarized the HUI by median with interquartile range (IQR) and mean with standard deviation (SD). They then compared the mean HUI and HSU-VAS across different sociodemographic and clinical characteristic groups using the Mann-Whitney U test or the Kruskal-Wallis test. Data were examined for statistical assumptions of normality, multicollinearity, and heteroscedasticity. To assess factors associated with HSU simultaneously, multiple linear regression was used. Coefficients (β) and 95% confidence intervals (CIs) were calculated. A P value less than 0.05 was considered statistically significant. Using STATA version 15 for data analysis.Results: A total of 398 confirmed Covid-19 cases were included in this study. The mean length of hospital stay was 14.3 days (SD: 4.78). The majority of Covid-19 cases were male (60%), aged over 55 years (28.9%) (Maximum age = 95 years) and residents of urban areas (61%). Regarding general health status at admission, 32.7% were severely ill, 20% had moderate symptoms, 23.4% had mild symptoms, and 23.9% were asymptomatic.

Forty-five percent of cases had multiple comorbidities, with diabetes mellitus (17.1%), hypertension (10.3%), and asthma (8.3%) being the top three comorbidities. Regarding antibiotic treatment regimens, 37.2% were treated with azithromycin, while 32.9% received a combination of azithromycin and ceftriaxone. In addition, approximately one-third (29.1%) were treated with dexamethasone. Furthermore, nearly two-thirds (59.3%) received intranasal oxygen supplementation (Table 1).The overall mean HSU of the EQ-5D index score was 0.688 (SD: 0.285) (Table 2). The overall mean HSU of the VAS score was 0.690 (SD: 0.129) (Table 3). There was significant variation in the mean HSU scores across age groups ($p<0.001$). The mean EQ-5D index score among those aged over 55 years was 0.567, while it was 0.783 among those aged younger than 25 years. In general, the mean EQ-5D index score was significantly lower for respondents with comorbidities (0.574) compared to those without comorbidities (0.777) ($p<0.001$) (Table 3). EQ-5D index scores were significantly lower among those with hypertension, chronic heart disease, chronic lung disease, asthma, chronic kidney disease, and diabetes mellitus compared to those without these comorbidities.Those receiving dexamethasone and supplemental intranasal oxygen had significantly lower EQ-5D index scores than those not receiving them ($p<0.001$), but there was no difference in EQ-5D index scores based on gender and residence (urban vs. rural).

The mean HSU for VAS scores was 0.629 among those aged 55 years and older, while it was 0.732 among those younger than 25 years. In addition, the mean VAS score was significantly lower for respondents using intranasal oxygen (0.604) compared to their counterparts (0.749) ($p<0.001$). Respondents receiving dexamethasone treatment ($p<0.001$), with hypertension ($p<0.002$), chronic heart disease ($p<0.005$), chronic lung disease ($p<0.001$), diabetes mellitus ($p<0.001$) and asthma ($p<0.001$) were associated with lower VAS scores (Table 3).The results of the multiple linear regression analysis are presented in Table 4. Patient age, having asthma as a comorbidity, and general health status during hospital admission were significantly associated with low HSU values. On the other hand, theythose treated with dexamethasone had significantly higher HSU values (P-value<0.05) (Table 4).

Table 2. Comparison of HSU values of EQ tools 5D-3L across demographic characteristics and clinical conditions of Covid-19 patients being treated at care center in the Arsi Zone, 2020–2021.

Miscellany bell	Health Utilities Value (EQ-5D-3L)					
	Me Diana	IQR (P25,P75)		Mean	Elementary School	*P* Value
Sex						
Woman	0.787	0.596	0.833	0.684	0.302	
Man	0.787	0.596	0.854	0.689	0.274	0.818
Age						
0-24	0.787	0.596	1,000	0.783	0.199	
25-34	0.787	0.596	1,000	0.778	0.213	<0.001
35-44	0.787	0.596	0.787	0.649	0.328	
45-54	0.691	0.596	0.854	0.653	0.213	
55+	0.596	0.596	0.787	0.567	0.314	
Residence						
City	0.787	0.596	0.854	0.692	0.282	0.967
Village	0.787	0.596	0.833	0.685	0.288	
Comorbidity						
No	0.787	0.596	1,000	0.777	0.257	<0.001
There is	0.596	0.596	0.787	0.574	0.279	
Hypertension						
No	0.787	0.596	0.854	0.699	0.285	0.001
There is	0.596	0.596	0.757	0.580	0.267	
Chronic Heart Disease						
No	0.787	0.596	0.854	0.703	0.277	0.004
There is	0.596	0.596	0.596	0.499	0.311	
Chronic Lung Disease						
No	0.787	0.596	0.854	0.703	0.277	<0.001
There is	0.596	0.596	0.596	0.499	0.311	
Asthma						
No	0.787	0.596	0.854	0.706	0.252	<0.001
There is	0.596	0.469	0.596	0.487	0.329	
Chronic Kidney Failure						
No	0.787	0.596	0.854	0.690	0.286	0.029
There is	0.596	0.361	0.596	0.535	0.186	
Diabetes mellitus						
No There is	0.787	0.596	1,000	0.711	0.281	<0.001
	0.596	0.596	0.787	0.575	0.280	
Malignancy						
No	0.787	0.596	0.854	0.687	0.288	0.859
There is	0.787	0.596	0.833	0.708	0.147	
HIV/AIDS						
No	0.787	0.596	0.843	0.688	0.285	0.354
There is	0.692	0.596	0.787	0.607	0.270	
Use of Dexamethasone						
No	0.787	0.596	1,000	0.735	0.280	<0.001
There is	0.596	0.596	0.787	0.571	0.262	
Intranasal Oxygen Use						
No	0.787	0.787	1,000	0.816	0.180	<0.001
There is	0.596	0.596	0.596	0.500	0.305	
Length of Hospitalization						
1-7 days	0.691	0.596	0.866	0.718	0.227	
7-14 days	0.787	0.596	1,000	0.719	0.283	
15 - 21 days	0.596	0.596	0.787	0.622	0.297	0.002
22 - 28 days	0.596	0.596	0.787	0.715	0.197	
> 28 days	0.596	0.596	0.787	0.604	0.241	
Overall	0.787	0.469	0.787	0.688	0.285	
		0.596	0.833			

SD=standard deviation; IQR=interquartile range; P value comes from the Mann–Whitney U test or the Kruskal–Wallis test

Discussion

Covid-19 has caused significant psychological and physiological stressfor patients and their families worldwide. This study examines the HRQOL of Covid-19 patients. using the EQ-5D-3L and VAS tools. The overall mean VAS score was 0.690 (median = 0.700). This is similar to a study from Egypt (72.2),[2°]Peru (76),[21]Spain (66.36),[13] TChina (85.52) [20] and Addis Ababa, Ethiopia (69.44).[22]In addition, the average EQ-5D index score among Covid-19 patients at discharge was 0.688 (SD=0.285).In general, these findings are in line with research in Iran which reported an EQ-5D index score of 0.612.[13]and Belgian research with an EQ-5D index score of 0.620,1[8]but the findingsThatmuch lower than the research from Norway (EQ-5D index score: 0.820),1[9]China (EQ-5D index score: 0.949) and Hong Kong (EQ-5D index score: 0.897).[2°'21]Variations in the HRQOL evaluation methods used (e.g., health utility rates, instruments, scales, study participant samples) may also, to some extent, contribute to these differences. Studies in China, Iran, Argentina, Belgium, and Norway used the EQ-5D-5L instrument, while studies inThisusing EQ-5D-3L. In addition, variations in age distribution may be a driver of variations in HRQOL across countries, and populations in studies. relatively younger (mean age = 40) than elsewhere. In the studyini, respondents aged 55 years and over had significantly lower HRQOL than younger people (0.567 vs. 0.783). This is similar to findings from Iran (0.554 vs. 0.618),[13]China (0.963 vs 0.889),[2°]and South Africa (0.655 vs 0.501).[22]Furthermore, in the regression analysis, age was also significantly associated with health utility status. This finding aligns with the findings from the Argentine study.[23]According to an Argentinian study, those over 50 years of age were 5.6 times more likely to have poor HRQOL than their peers.

This finding may be explained by increased mental stress, comorbidities, and physical frailty in older adults..[24]In contrast, middle-aged male patients (26–35 years) had a five-fold greater risk of having poor HRQOL. Qualityhlifebquality in Saudi Arabia compared to older people (55–65 years).[25] According to researchini, comorbidities, particularly asthma (Table 4), were significantly associated with lower health utility scores (Table 2). This is similar to a study from Vietnam.,[26]Palestine,[27]Peru,[28]India[29]and Addis Ababa, Ethiopia.[3°]The mean VAS score was significantly lower for respondents with comorbidities (62) compared to those without them (75) ($p < 0.001$).In general, comorbidities (such as hypertension, chronic heart disease, chronic lung disease, asthma, chronic kidney disease, and diabetes mellitus) were significantly associated with low HSU VAS scores. A study from Vietnam (70.8 vs. 63.3),[31]China (97.9 vs 82.8)[2°]and Palestine (80 vs 70)[27]revealed that individuals with chronic illnesses had lower HRQOL than those without comorbidities, possibly because those with comorbidities experienced anxiety or depression in response to misinformation spread about the impact of the virus in these communities..[25'32] Writerfound that Covid-19 patients who received dexamethasone supplementation and intranasal oxygen had lower EQ-5D index scores than those who did not receive them ($p < 0.001$), possibly because those requiring such treatment had a more severe form of the disease. Furthermore, those with a length of stay (LOS) of more than 15 days in the hospital had lower EQ-5D index scores than their counterparts. Studies from China, Spain, and Argentina also revealed that increased LOS was associated with poor HRQOL..[1°'33-35]

This poor HRQOL may be due to confinement, increased anxiety, and reduced overall HRQOL. This study is the first comprehensive analysis of HRQOL in COVID-19 patients in Ethiopia to our knowledge.Writerconducted a study in an environment that accommodated patients from 28 districts. However, the study has several limitations. First, because the study collected HRQOL data based on patient preferences, patients may have overestimated or underestimated their health status during the interview. Second,writerdid not have HRQOL estimates for 22 patients who were lost to follow-up due to referral to another level of care. In addition, this study usedserviceZimbabwean rates due to the absence of Ethiopian rates, and this limitation may affect the true Ethiopian HRQOL estimates for the disease, as there are many differences between the two countries. In addition, due to the cross-sectional design of the study,so thatunable to compare HRQOL of patients before Covid-19 infection.

Table 3. Comparison of HSU VAS values based on demographic and clinical characteristics of Covid-19 patients treated at treatment centers in the Arsi Zone, 2020–2021 Variable Health utility value

Bell Varia	Health utility value (VAS)					
	Me dian	IQR (P25, P75)		Mean	Elementary School	P Value
Sex						
Male Female	0.700 0.700	0.600 0.600	0.800 0.800	0.689 0.692	0.134 0.127	0.961
Age						
0-24 25-34 35-44 45-54 55+	0,7250,7500,7000,6800,620	0.610 0.6500,6800,6000,580	0.860 0.8400,780,7800,710	0.7320,7340,6860,6780,629	0,1260,1210,1260,1230,118	<0.001
Residence						
Village Town	0.7000.700	0.6000.600	0.8100.790	0.6950.688	0.1320.128	0.927
Comorbidity						
There isn't any	0.7500.620	0.6000.600	0.8100.790	0.6950.688	0.1320.128	<0.001
Hypertension						
There isn't any	0.7000.610	0.6000.580	0.8000.700	0.6970.634	0.1310.096	0.002
Chronic Heart Disease						
There isn't any	0.7000.630	0.600 0.570	0.8000.700	0.6950.613	0.1290.103	0.005
Chronic Lung Disease						
There isn't any	0.7000.605	0.600 0.570	0.8000.660	0.6970.606	0.1300.81	<0.001
Asthma						
There isn't any	0.7000.590	0.6000.560	0.8000.640	0.6990.601	0.1290.094	<0.001
Chronic Kidney Disease						
There isn't any	0.7000.630	0.6000.550	0.8000.660	0.6920.607	0.1290.094	0.081
Diabetes Mellitus						
There isn't any	0.7050.700	0.6000.570	0.8200.700	0.7050.622	0.1290.109	<0,001
Malignancy						
There isn't any	0.7000.710	0.6000.600	0.8000.780	0.6910.075	0.1300.117	0.782
HIV/AIDS						
There isn't any	0.7000.665	0.6000.590	0.8000.750	0.6910.653	0.129 0.112	0.531
Use of Dexamethasone						
There isn't any	0.7300.600	0.6100.750	0.8480.700	0.7180.625	0.1310.097	<0.001
Intranasal Oxygen Use						
There isn't any	0.7500.600	0.6950.560	0.8500.660	0.7490.604	0.1160.096	<0.001
Length of Hospitalization						
1 - 7 days 8-14 days 15 - 21 days 22 - 28 days > 28 days 0verall	0.6900.720 0.640 0.6400.6150.700	0.6100.600 0.590 0.6000.5300.600	0.8200.820 0.730 0.7500,7300,800	0.7030.709 0.657 0.6870.6290.690	0.1330.229 0.122 0.6870.6290.690	0.004

SD=standard deviation; IQR=interquartile range; P value comes from the Mann–Whitney U test or the Kruskal–Wallis test

Table 4. Multiple linear regression analysis for factors related to HSU values of Covid-19 patientstreated at a treatment center in the Arsi Zone, 2020–2021.

Variables	HSU EQ-5D Value (Adjusted R2: 45%)			
	Coefficient	P Value	[95% CI]	
Gender (Female)	0.024	0.276	-0.019	0.068
Age (Years)	-0.001	0.048	-0.002	0, 000
Residence (Village)	-0.003	0.905	-0.047	0.042
Hypertension (No)	-0.017	0.602	-0.089	0.056
Chronic Heart Disease (No)	-0.032	0.512	-0.129	0.065
Chronic Lung Disease (No)	-0.018	0.678	-0.101	0.066
Asthma (No)	-0.091	0.024	-0.169	-0.012
Chronic Kidney Disease (No)	0.022	0.778	-0.140	0, 185
Diabetes Mellitus (No)	-0.009	0.791	-0.069	0.053
Violence (No)	-0.008	0.887	-0.140	0, 121
AIDS HIV (No)	0.039	0.664	-0.137	0, 215
Dexamethasone (No)	0.089	0.002	0.033	0, 145

Oxygen Use(No)	-0.042	0.251	-0.114	0.030
Health Status Upon Admission				
Mild (No symptoms)	-0.093	0.004	-0.156	-0.031
Currently(Asymptomatic)	-0.269	0,000	-0.341	-0.197
Severe/Critical(Asymptomatic)	-0.445	0,000	-0.537	-0, 353
Treatment Duration (in days)	-0.001	0.767	-0.005	0.004
-Constanta	0.995	0.000	0.870	1,039

Coef: Coefficient; CI: Confidence Interval; SE: Standard Error; Ref: Reference Category

Table 4. Multiple linear regression analysis for factors associated with HSU values of Covid-19 patients treated at treatment centers in the Arsi Zone, 2020–2021

Variables	HSU EQ-5D Value (Adjusted R2: 55%)			
	Coefficient	P Value	[95% CI]	
Gender (Female)	0.013	0.155	-0.005	0.031
Age (Years) (in years)	0,000	0.030	-0.001	0, 000
Residence (Village)	-0.004	0.695	-0.022	0.014
Hypertension (No)	-0.015	0.326	-0.044	0.015
Chronic Heart Disease (No)	-0.018	0.371	-0.058	0.022
Chronic Lung Disease (No)	-0.007	0.689	-0.042	0.027
Asthma(No)	-0.036	0.029	-0.068	-0.004
Chronic Kidney Disease (No)	-0.003	0.933	-0.069	0.064
Diabetes Mellitus(No)	-0.017	0.192	-0.041	0.008
Violence (No)	-0.038	0.158	-0.92	0.015
AIDS/HIV (No)	0.030	0.409	-0.042	0, 103
Dexamethasone (No)	0.012	0.026	0.003	0.049
UsageOxygen (No)	0.026	0.421	-0.017	0.043
Health Status Upon Admission				
Mild (No symptoms)	-0.064	0,000	-0.089	-0.038
Moderate (No symptoms)	-0.171	0,000	-0.200	-0.142
Severe/Critical (No symptoms)	-0.243	0,000	-0.281	-0.206
Treatment Duration (in days)	-0.001	0.237	-0.003	0.002
-Constanta	0.847	0,000	0.812	0, 881

Coef: Coefficient; CI: Confidence Interval; SE: Standard Error; Ref: Reference Category

III. CONCLUSION

Covid-19 disease substantiallyimpairing the HRQOL of patients in Ethiopia. Elderly patients and COVID-19 patients with comorbidities have significantly lower HRQOL. Therefore, close clinical follow-up and psychological care should be encouraged for these groups. Furthermore, the health benefit values from this study can be used to evaluate quality-adjusted life years for future cost-effectiveness analyses of preventive and treatment interventions for COVID-19.

Abbreviation

EQ-5D-3L: Euro Qal–5 Dimension–3 Level; HRQOL: Health-related quality of life; HIV: Human immunovirus; HUI: Health utility index; HSU: Health state utility; LOS: Length of stay; ICU: Intensive care unit; SD: Standard deviation; SF-36: Standard format–36; VAS: Visual analogue scale; WHO: World Health Organization.

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