

Health Related Quality of Life of Patients with Chronic Non-Communicable Diseases During the Coronavirus Pandemic in Ethiopia: A Multi-Facility Study

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Abstract

Background

The Coronavirus pandemic is presenting several challenges in Ethiopia on an unprecedented scale. It is affecting the country in different ways ranging from a significant impact on the economy to a disrupted public health delivery of both curative and preventive services. The aim of this study was to assess health related quality of life of patients with chronic non-communicable diseases during the Coronavirus pandemic in Addis Ababa, Ethiopia.

Methods

A multi-facility based cross sectional study design was conducted in August 2020 among public health institutions in Addis Ababa. Health facilities were chosen purposively based on high number of patient flow. Participants from each health facility were drawn after proportional to size allocation. A translated EQ-5D-3L VAS instrument was used to collect data. Analysis was done using SPSS v.26.0. Descriptive statistics, Mann Whitney U test, Kruskal Wallis test, Spearman's rank correlation test and Binary logistic regression were applied.

Results

Of the 409 participants included in the study, majority were in the age group of 46-60 (36%), females (56%), from hospitals (54.8%), jobless (25.4%), married (63.3%) and orthodox Christian (71.4%). Above two third of the patients reported no problems for self-care, usual activity and depression/anxiety. All dimensions showed an increasing proportion of moderate to severe problems in the age group beyond 45. Facility type ($U=16651$, $P=0.001$), comorbid condition ($U=13248.00$, $P=0.000$) and age ($r_s=-0.27$, $p=0.000$) were found to show statistically significant score difference for GQoL. An overall prevalence of any problem was 59%. Education level, visit to a health center and marriage were associated with less odds of an affected HRQoL unlike lower monthly income and presence of comorbidities which were opposite.

Conclusions

HRQoL of patients in the study settings was found to be suboptimal and below the general population. Education and arrangement of safe and quality health services to such group of patients is warranted especially during the COVID-19 pandemic.

Background

According to World Health Organization (WHO), quality of life (QoL) is defined as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns [1]. Another definition presents QoL as a global personal assessment of a single dimension which may be causally responsive to a variety of other

distinct dimensions that encompasses the entire range of human experience, states, perceptions and spheres of thought [2]. When peoples' QoL is studied under specific health conditions, it is termed as health related quality of life (HRQoL). Patrick and Erickson (1993) defined HRQoL as the value assigned to duration of life as modified by the impairments, functional states, perceptions and social opportunities that are influenced by disease, injury, treatment or policy [3]. Main aspect in HRQoL study is how the manifestation of an illness or treatment is experienced by an individual [4].

Virtually, most HRQoL measurement approaches include two core concepts: subjectively and multidimensionality. While the subjectivity emphasizes to obtain input from (or at least on behalf of) the affected person the multidimensional aspect of the definition is a reminder that a full appreciation of the impact of illness and treatment requires assessment of important life domains. It consists of at least three broad domains – physical, psychological, and social functioning – that are affected by one's disease and/or treatment [5]. Accordingly, there are two main sets of instruments to measure HRQoL. One group is generic HRQoL measures which ask questions that are usually general enough to be applicable to almost everyone, including those without health conditions. Though more options are available in this set [3], the EuroQol five dimensional (EQ-5 D) standardized questionnaires [6] got a recent attention. On the other hand, targeted instruments are applied to measure HRQoL for a specific disease such as cancer.

Studies have been conducted to evaluate the HRQoL of patients with type 2 diabetes mellitus (T2DM) across regions of Ethiopia [7-12]. Yet, a finding from the capital, Addis Ababa, showed HRQoL to be influenced by diabetic nephropathic pain [13]. However, evidences on HRQoL or global quality of life (GQoL) of both T2DM and hypertensive patients with or without concomitant occurrence are scarce. Furthermore, the available studies employed a varied sample size, considering only T2DM for many, and distinct instrument applied on a single health facility which may pose difficulty to draw generalizations.

This study aims to present a comprehensive analysis on HRQoL of patients with chronic non communicable disease visiting public health facilities during the COVID-19 pandemic in Ethiopia. The fact that patients might have experienced problems in some HRQoL dimensions may reflect impacts the COVID-19 pandemic poses during the past six months. Variabilities of GQoL by institution type where patients have followed up, age, sex and comorbid conditions are of interest to this study. Lastly, factors associated with affected HRQoL are illustrated.

Methods

Study setting

This study was conducted in Addis Ababa, the capital city of Ethiopia. As per the 2007 national census [14], its total population was 3,384,569 with annual growth rate of 3.8%. There are 12 public hospitals in Addis Ababa [15] six of which and 103 health centers are under the city administration [16]. This study was conducted in two hospitals namely; Saint Paul's Hospital Millennium Medical College (SPHMMC); a federal referral hospital and Ras Desta Damtew Memorial Hospital (RDDMH)-one of the city

administration's hospital and, five health centers namely; Arada, Lideta, Nifas Silk Lafto Wereda 9, Akaki Kality and Bulbula health centers.

Design and period

A multi-facility based cross sectional study design was conducted throughout August 2020.

Source and study population

The source population was all adult outpatients with T2DM and chronic hypertension in the study area. The study population is all outpatients with T2DM and hypertension visiting public hospitals and health centers and fulfilled the inclusion criteria.

Inclusion and exclusion criteria

Inclusion criteria

Adult outpatients with at least one chronic illness and started taking medications for at least six months, visiting the facility during the study period, willing to participate in the study, and those who could speak Amharic language were included in the study.

Exclusion criteria

Patients with any long term or temporary psychiatric problems, patients admitted to the emergency/inpatient department for any reason, and patients aged below 14 were not included.

Sample size and Sampling technique

The single population proportion formula was employed to estimate sample size required for the study. To attain maximum size, the proportion of patients with affected HRQoL was considered as 50%. A 95% confidence level and a 5% tolerable error assumption were considered to estimate the sample size. Taking in to account of 10% contingency for nonresponse, the required number of respondents was 423. Both hospitals and health centres were selected intentionally (purposively) grounded on patient flow and socio-economic aspects. Participants from the respective facilities were included based on availability during the framed data collection period. In the same vein, allocation per T2DM and hypertension cases in each facility was determined based on follow up outpatient loads reported in similar settings [17-20].

Study variables

Dependent variables:

The dependent variable of this study were HRQoL and GQoL

Independent variables:

Socio-demographic: age, sex, marital status, education, occupation, religion, substance use history, income level, type of relation with others, number of people around.

Clinical related: type of chronic illness, number of comorbidities, time since diagnosis, time since initiation of treatment.

Facility related: type of follow up facility.

Data collection instrument and procedure

Data was collected using a structured interviewer-administered questionnaire prepared from the literature. Patients' HRQoL was measured using the standardized EQ-5D-3L generic tool [6]. The tool has five dimensions namely: mobility, self-care, usual activities, pain/discomfort and depression/anxiety on three levels as; no problem, some or moderate problem and severe problems. Likely, patients' subjective judgement about their current state of overall health was measured using the Euroqol visual analogue scale (EQ VAS) [6] anchored with adapted patient aiding terms [21]. Collected quantitative data included; socio-demographic profiles, clinical and social factors, substance use history and quality of life scores.

Data quality management

The quality of data collected was ensured through the use of trained data collectors, continuous supervision, and application of a pre-tested instrument in the data collection. Furthermore, the instrument was translated to Amharic, a national working language in the country, and back translated for analysis and reporting. Content validity of the instrument, on selected variables of interest to the research question, was checked by experts in the team. A Cronbach's alpha test was done to measure reliability of the EQ-5D-3L scale on similar populations to health centres and hospitals (10% for each) and score showed high internal consistency ($\alpha = 0.85$ and 0.91 respectively).

Operational definitions

Patients with chronic non-communicable diseases: patients diagnosed with T2DM or/and hypertension visiting the selected health facilities and commenced with medications at least six months earlier to the study period. Additional follow up comorbidities may or may not present.

Affected HRQoL: A cumulative score from mobility, self-care, usual activities, pain/discomfort and depression/anxiety aspects of a patient and summing up to 6 or more (reporting at least one moderate or severe problem) in the EQ-5D-3L instrument. Score sums of 5 (reporting no problems to all dimensions) were considered not affected.

Global quality of life (GQoL): Patients' self-rating of their own current overall health status on a numerical simplified EQ VAS scale ranging from 0 (worst imaginable health state) to 100 (best imaginable health state).

Any problems: refer a patient's experience of least one or a combination of problems at moderate to severe degree on the EQ-5D-3L tool.

Ethical approval and consent

Ethical approval has been obtained from Saint Paul's hospital millennium medical college (SPHMMC). Additional approval was sought from the Addis Ababa Health Bureau (AAHB) research ethics committee. A support letter was written from SPMMC and AAHB to the respective facilities. Data and information acquired through the study were kept confidential. No individual identifiers were collected and analysis was made in aggregate. Inclusion in the study was solely on voluntarily basis.

Data analysis

Collected data was coded, cleaned manually and entered in SPSS version 26.0 for windows. We used descriptive statistics to present univariate and bivariate analysis. Binary logistics regression was used to identify associated factors with affected HRQoL. A 95% confidence level was considered with statistical significance of ($p \leq 0.2$) for the bi-variable and ($p \leq 0.05$) the multivariable outputs. A Shapiro-Wilk test was considered for checking normality of GQoL scores. Because the data showed a non-parametric distribution ($W(409) = 0.94, p = 0.000$), mean difference by sex, comorbid condition, and facility types was tested using the Mann Whitney U test. Potential difference by diagnosis type was tested using the Kruskal Wallis test. The ranked median difference test for Age category vs. GQoL was tested using the Spearman's rank correlation coefficient. A p-value of 0.05 was considered as a cut point of statistical significance in all difference tests.

Results

Socio-demographic characteristics

Out of the 423 participants who fulfilled the inclusion criteria, 409 completed the investigator administered questionnaire and subsequently considered in the analysis (96.7% response rate). The mean (SD) of age was 56.6 (13.4) years ranging from 19 to 95. About 229 (56%) were female and

224(54.8%) were from hospitals. A total of 174 (42.5%) respondents were either able or not to read and write whereas 165(40.4%) attended primary/secondary education. About 104 (25.4%) were jobless and 97 (23.7%) were housewives. Majority were married (63.3%) and from orthodox Christian faith (71.4%). The average monthly income ranged from 0 to 120000 with mean (SD) of 2996.5(6593) and median of 2000 Ethiopian Birr (ETB). Over half (54.3%) of the patients are above the World Bank line of extreme poverty class. Yet, 250(61.1%) have at least two chronic diseases on follow up. Nearly a half of the respondents lasted a maximum of five years since diagnosed with the disease (57.5%) and initiated with a follow up medication (51.6%) (**Table 1**).

Table 1: socio-demographic characteristics of patients with chronic non-communicable diseases visiting public health facilities during the COVID-19 pandemic in Addis Ababa, Ethiopia, August 2020 (n=409)

Characteristic	Category	Frequency	Percent
Age ^a			
	<=45 years	88	21.5
	46-60 years	147	35.9
	>=61 years	174	42.5
Sex			
	Male	180	44
	Female	229	56
Facility level			
	Health centers	185	45.2
	Hospitals	224	54.8
Education			
	Able/Not able to read and write	174	42.5
	Primary/secondary education	165	40.4
	College/University education	70	17.1
Occupation			
	Merchant	26	6.4
	Government employee	63	15.4
	Private employee	74	18.1
	Housewife	97	23.7
	Jobless	104	25.4
	Others ^b	45	11.0
Marital status			
	Unmarried	53	13.0
	Married	259	63.3
	Divorced/separated/widowed	97	23.7
Religion			
	Orthodox	292	71.4
	Protestant	44	10.8

	Muslim	61	14.9
	Others ^c	12	2.9
Average monthly income (ETB) ^d			
	<=1995	187	45.7
	>=1996	222	54.3
Comorbid condition			
	No	159	38.9
	Yes	250	61.1
Time since diagnosis			
	<=5 years	235	57.5
	6-10 years	111	27.1
	>=11 years	63	15.4
Time since initiation of medication			
	<=5 years	211	51.6
	6-10 years	128	31.3
	>=11 years	70	17.1
Current history of any substance use ^e			
	Yes	32	7.8
	No	377	92.2
Main diagnosis			
	T2DM only	132	32.2
	Hypertension only	143	35.0
	Both T2DM and hypertension	134	32.8

^a Is considered based on the average age for onset of t2dm in sub-Saharan region [22] and Ethiopian age of retirement. ^b Includes students, daily laborers and prostitutes. ^c Includes Catholic, Waqefeta and Hawaryawi. ^d Is categorized based the World Bank's poverty line definition for developing countries [23] and US Dollar exchange rate during the study period.

EQ-5D-3L measurement of patients' HRQoL

The HRQoL of patients was measured using the EQ-5D-3L generic questionnaire. The descriptive presentation in **Table 2** illustrates that majority of the patients do not have problems in mobility (261, 63.8%) self-care (323, 79.0%) performing usual activities (290, 70.9%), pain/discomfort (217, 53.1%) and depression/anxiety (280, 68.5%). Frequently noted moderate problems were pain/discomfort (39.6%), mobility (31.3%) and depression/anxiety (28.6%). Only few participants reported severe problems per each dimension.

Table 2: EQ-5D-3L frequencies reported by dimension and level among patients with chronic non-communicable diseases visiting public health facilities during the COVID-19 pandemic in Addis Ababa, Ethiopia, August 2020 (n=409)

	Mobility	Self-care	Usual activities	Pain/ discomfort	Depression/anxiety
	N (%)	N (%)	N (%)	N (%)	N (%)
Level 1	261(63.8)	323(79.0)	290(70.9)	217(53.1)	280(68.5)
Level 2	128(31.3)	67(16.4)	91(22.2)	162(39.6)	117(28.6)
Level 3	20(4.9)	19(4.6)	28(6.8)	30(7.3)	12(2.9)
Total	409(100)	409(100)	409(100)	409(100)	409(100)

Level 1: no problems, **Level 2:** some/moderate problems, **Level 3:** severe problems

In addition, an age-wise distribution of specific dimensions with three levels of the scale showed that presence of any problems progressed with advancing age. Problems related to mobility, self-care and usual activity were minimal compared to scores for pain/discomfort and depression/anxiety among the patients aged below 46. On the other hand, all dimensions showed an increasing proportion of moderate to severe problems in the subsequent age groups (**Table 3**).

Table 3: Age-wise classification of EQ-5D-3L dimension and level among patients with chronic non-communicable diseases visiting public health facilities during the COVID-19 pandemic in Addis Ababa, Ethiopia, August 2020

Age category (yrs.)	EQ-5D-3L scale					
		Mobility N (%)	Self-care N (%)	Usual activities N (%)	Pain/ discomfort N (%)	Depression/ anxiety N (%)
<=45 (n=88)	Level 1	74(84.1)	86(97.70)	81(92.0)	61(69.3)	66(75.0)
	Level 2	13(14.8)	1(1.1)	6(6.8)	23(26.1)	19(21.6)
	Level 3	1(1.1)	1(1.1)	1(1.1)	4(4.5)	3(3.4)
46-60 (n=147)	Level 1	104(70.7)	123(83.7)	113(76.9)	91(61.9)	109(74.1)
	Level 2	39(26.5)	21(14.3)	26(17.7)	51(34.7)	36(24.5)
	Level 3	4(2.7)	3(2.0)	8(5.4)	5(3.4)	2(1.4)
>60 (n=174)	Level 1	83(47.7)	114(65.5)	96(55.2)	65(37.4)	105(60.3)
	Level 2	76(43.7)	45(25.9)	59(33.9)	88(50.6)	62(35.6)
	Level 3	15(8.6)	15(8.6)	19(10.9)	21(12.1)	7(4.7)

Difference or correlation between GQoL score and selected patient attributes

Respondents were asked to rate their current health state using the modified EQ-5D VAS scale. The mean (SD) score of GQoL was 69.44 (18.5) and median of 70 with interquartile range of 25(85-60). The ranked mean difference for diagnosis type, sex, comorbidity and facility type was tested against GQoL scores. No variation was noted by being under a specific diagnosis or combination namely; T2DM only, hypertension only or both ($H(2) = 4.282, P = 0.118$). A Mann Whitney test indicated that the distribution of GQoL is the same across both sexes ($U = 18722.000, P = 0.106$). Meanwhile, the same test has also shown a statistically significant rank difference between patients with single and any additional chronic comorbidities on GQoL score ($U = 13248.00, P = 0.000$). Patients with single chronic condition are more likely to be in a higher mean rank of GQoL compared to those with any chronic comorbid conditions (Figure 1).

Similarly, presence of mean rank difference was tested between health facility types over GQoL score distribution. A statistically significant difference was noted ($U=16651$, $P=0.001$) where higher rank of mean was scored among patients visiting health centers (**Figure 2**).

The correlation between age and GQoL of patients was tested using the Spearman's rank correlation statistic. It was found that age showed a statistically significant negative correlation with GQoL score. The magnitude, however, is weak ($r_s=-0.27$, $p=0.000$).

Affected HRQoL and associated factors

Of all, 242 (59.2%) of the patients reported any problems based on the EQ-5D-3L questionnaire. This was regarded as affected HRQoL covering moderate to severe health related problem on the scale. Remaining proportion of the patients has reported to be in the best imaginable health state.

Compared to the age group 45 or below, the odds of developing any problems in the HRQoL dimensions was not statistically significant until the age of 60. About a 2.23 times higher likelihood of an affected HRQoL was noted in the subsequent age group (AOR: 2.23; 95% CI: 1.10-4.50). Odds of affected HRQoL among patients attending hospitals is higher by 75% (AOR: 1.75; 95%CI: 1.07-2.86) as compared to those visiting health centers. As education level increased, the likelihood to develop any problems decreased by 54% among those with primary education (AOR: 0.46; 95%CI: 0.27-0.81) and by 61% among those with college/University education (AOR: 0.39; 95%CI: 0.18-0.84) compared to those who are able/not able to read and write. Odds of affected HRQoL among married patients were 60% lower as compared to the unmarried group (AOR: 0.40; 95%CI: 0.20-0.81). Being under the World Bank extreme poverty line (1.90USD per person per day) increased the odds of affected HRQoL by 77% (AOR: 1.77; 95%CI: 1.08-2.88). Similarly, presence of any chronic comorbidity was associated with a 1.95 fold of developing affected HRQoL (AOR: 1.95; 95%CI: 1.22-3.14) (**Table 4**).

Table 4 : Factors associated with affected HRQoL among patients with chronic non-communicable diseases visiting public health facilities during the COVID-19 pandemic in Addis Ababa, Ethiopia, August 2020 (n=409)

Variable	Category	HRQoL		COR	AOR
		Not affected (n)	Affected (n)	(95%CI)	(95%CI)
Age ^a					
	<=45 years	48	40	1	1
	46-60 years	74	73	1.18(0.70-2.01)	1.03(0.55-1.90)
	>=61 years	45	129	3.44(2.01-5.90)	2.23(1.10-4.50)
Facility level					
	Health centers	86	99	1	1
	Hospitals	81	143	1.53(1.03-2.28)	1.75(1.07-2.86)
Education					
	Able/Not able to read and write	49	125	1	1
	Primary/secondary education	77	88	0.45(0.29-0.70)	0.46(0.27-0.81)
	College/University education	41	29	0.28(0.16-0.50)	0.39(0.18-0.84)
Marital status					
	Unmarried	21	32	1	1
	Married	125	134	0.70(0.39-1.28)	0.40(0.20-0.81)
	Divorced/separated/widowed	21	76	2.38(1.14-4.94)	0.98(0.42-2.30)
Average monthly income (ETB) ^d					
	<=1995	57	130	2.24(1.49-9.37)	1.77(1.08-2.88)
	>=1996	110	112	1	1
Comorbid condition					
	No			1	1

Yes

2.68(1.78-
4.05)

1.95(1.22-
3.14)

Discussion

Evaluation of HRQoL of patients with chronic illness using commonly accepted constructs [24, 25] places an invaluable advantage to understand the impact of an illness and effect of various interventions [26]. The present study showed that over half of the patients attending at chronic follow-up of public health facilities in Addis Ababa have unaffected quality of life in terms of at least one dimension of the EQ-5D-3L instrument. Above a two third of the patients reported no problems (Level I) for self-care, usual activity and depression or anxiety. Frequently noted moderate problems were pain/discomfort (39.6%), mobility (31.3%) and depression/anxiety (28.6%). This could be due to the fact that such dimensions are frequently experienced among patients with chronic diseases [27]. There is also an evidence for mutual correlation and pathophysiologic mechanisms of pain and depression in this population [28-30]. The study also identified that there is notable influence that COVID-19 pandemic posed on patients with chronic conditions in resource limited settings [31]. High magnitude of COVID-19 related psychosocial distress was also reported by the general community [32]. The distribution of moderate to severe levels of each dimension was noted to surge with increasing age. The fact that majority was below the age of 60, after which functional and physical statuses are often reported to decline [33, 34], may contribute to higher average per dimension score.

Mean GQoL score of patients in the present study (mean=69.44 +_18.5) is comparable with reports in a similar population [35, 36]. Slightly higher figures were documented from Japan [37] and India [38]. Whereas, comparators with the same measurement and population are lacking in the study area, the figure is smaller against the population based EQ VAS valuation score (mean=87.27+_13.63) for Ethiopians [39]. Yet, this result is almost the same to the EQ VAS score of breast cancer patients (mean =69.94+_20.36) at Tikur Anbessa Specialized Hospital in the same setting [40].

No statistically significant difference was noted between any or a combination of the main diagnoses included in the current study. While co-occurrence is a common situation, this could be likely because it is often the further complications to come that affect a patient's HRQoL in both groups [41, 42]. Mere co-presence of hypertension and type 2 diabetes mellitus may not be associated with impaired quality of life [42, 43]. However, there was a statistically significant difference between those with the single main diagnoses vs. co-presence of other comorbidities. The presence of reported complications, such as stroke, heart disease, nerve problems, chronic kidney disease and other disease as chronic asthma might contribute for changes in QoL. Patients visiting health centers showed a better quality of life compared to those attending at hospitals (mean rank=226.99 vs. 186.84). This could be attributed to differences in stage of the disease whereby patients with advanced states might be referred to hospitals. The fact that majority of the patients from the hospitals reported at least one additional problem compared to their health center counter parts (68% vs. 53%) may strengthen this argument.

On the other hand, attendance in hospitals may demand patients for long waiting times (due to high patient loads), less consultation time and lower satisfaction with service also documented elsewhere [44] and in Ethiopia [45, 46]. Likely, as hospitals were centers for COVID-19 management, patients might experience more degree of fear and anxiety as the result showed (4.5% vs. 1.1%). Though skilled professional and technology capabilities are integral to be questionable in the present setting, report also exists showing that better patient care services are delivered at community health centers [47]. Age of patients exhibited a statistically significant negative correlation with EQ VAS score. Despite variation in tools used and diseases under consideration, studies support the inverse impact age has on patients' overall QoL [48-50].

Based on the EQ-5D-3L measurement, affection at any degree (some to severe problems) of some health dimensions was reported by over half of participants (59.2%). Apart from measuring GQoL on the EQ VAS single score, the merged score of affected health state from the EQ-5D-3L was evaluated against multiple patient attributes. The similarity between the two measurements may show reliability of patient ratings across specific dimensions and overall evaluation of current health.

Also in line with the Spearman's correlation test result between GQoL and age, the multivariable logistic regression illustrated that lower age (below 60), in the present setting, showed a protective effect on the odds of affected health related quality of life by 53%. This is likely as physical [51, 52] and psychological [53] functioning diminishes with age leading to comorbidities and onset of complications [54, 55]. In the same fashion, affected HRQoL of patients decreased with higher education level and marriage. This is in agreement with other studies where educated [56, 57] and married [56] patients have reported to have better EQ 5D score implying that they practice better prevention strategies and health lifestyle. Conversely, the odds of affected HRQoL increased among patients visiting hospitals, those under the World Bank extreme poverty line and presence of any comorbid condition. Patients with the extreme poverty condition (those earning below 1.9 USD/per day per person) are at worse than others to engage in preventive and rehabilitative behavior. As most were either jobless, private employees or engaged in irregular income sources) simply wandering to satisfy physiologic needs, the odds of affected HRQoL in this group can be understood as caused. While this holds true among the general population [58] and other chronic diseases [59, 60], patients with T2DM [61, 62] and hypertension are affected most [63, 64].

This study has tried to present a comprehensive report on HRQoL aspects of patients with T2DM and hypertension. Whereas these diseases often co-occur on most patients, inclusion of varied socio-economic diversity may represent the QoL of patients during COVID-19 pandemic in an urban setting. However, results should be interpreted with caution due to lack of randomization in the sampling process of patients and unavailable validity report to the EQ-5D-3LVAS instrument among chronic patients in Ethiopia. Future studies with better design and random sampling techniques are recommended.

Conclusion

Majority of the patients with chronic illness visiting public health facilities in Addis Ababa do not have problems on each dimension of the EQ-5D-3L instrument. However, a remarkable depreciation of HRQoL with age was noted owing to progression of moderate to severe problems. Whereas sex and diagnosis type did not show difference in GQoL score of the EQ VAS scale, facility type, comorbid condition and age category were found to show score differences. Overall, about 59% of the patients have reported at least any problem based on the EQ-5D-3L instrument. Age showed a negative correlation with GQoL score. While education level, visit to a health center and marriage were associated with less odds of an affected HRQoL, the likelihood of same outcome was increased with lower monthly income and presence of comorbidities.

Abbreviations

AAHB	Addis Ababa Health Bureau
AOR	Adjusted Odds Ratio
COR	Crude Odds Ratio
COVID-19	Corona Virus Disease-2019
EQ VAS	EuroQol Visual Analogue Scale
EQ-5D-3L	EuroQoL 5 Dimensional 3 Level
ETB	Ethiopian Birr
GQoL	Global Quality of Life
HRQoL	Health Related Quality of Life
QoL	Quality of Life
RDDMH	Ras Desta Damtew Hospital
SD	Standard Deviation
SPHMMC	Saint Paul's Hospital Millennium Medical College
T2DM	Type 2 Diabetes Mellitus
USD	United States Dollar
WHO	World Health Organization

Declarations

Ethical approval and consent

Ethical approval has been obtained from Saint Paul's hospital millennium medical college (SPHMMC). Additional approval was sought from the Addis Ababa Health Bureau (AAHB) research ethics committee.

A support letter was written from SPMMC and AAHB to the respective facilities. Data and information acquired through the study were kept confidential. No individual identifiers were collected and analysis was made in aggregate. Inclusion in the study was solely on voluntarily basis.

Consent for publication

Not applicable.

Availability of data

The datasets analyzed during the current study are available from the corresponding author.

Competing interests

The authors declare that they have no competing interests.

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Authors' contribution

TS conceived the idea and designed the study. RA, GB, MB, MG and AG were involved in the protocol development and coordinated the data collection. TS, ZS and MA performed the data entry, analysis and completed the write up process. All authors have read and approved the final manuscript.

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Figures

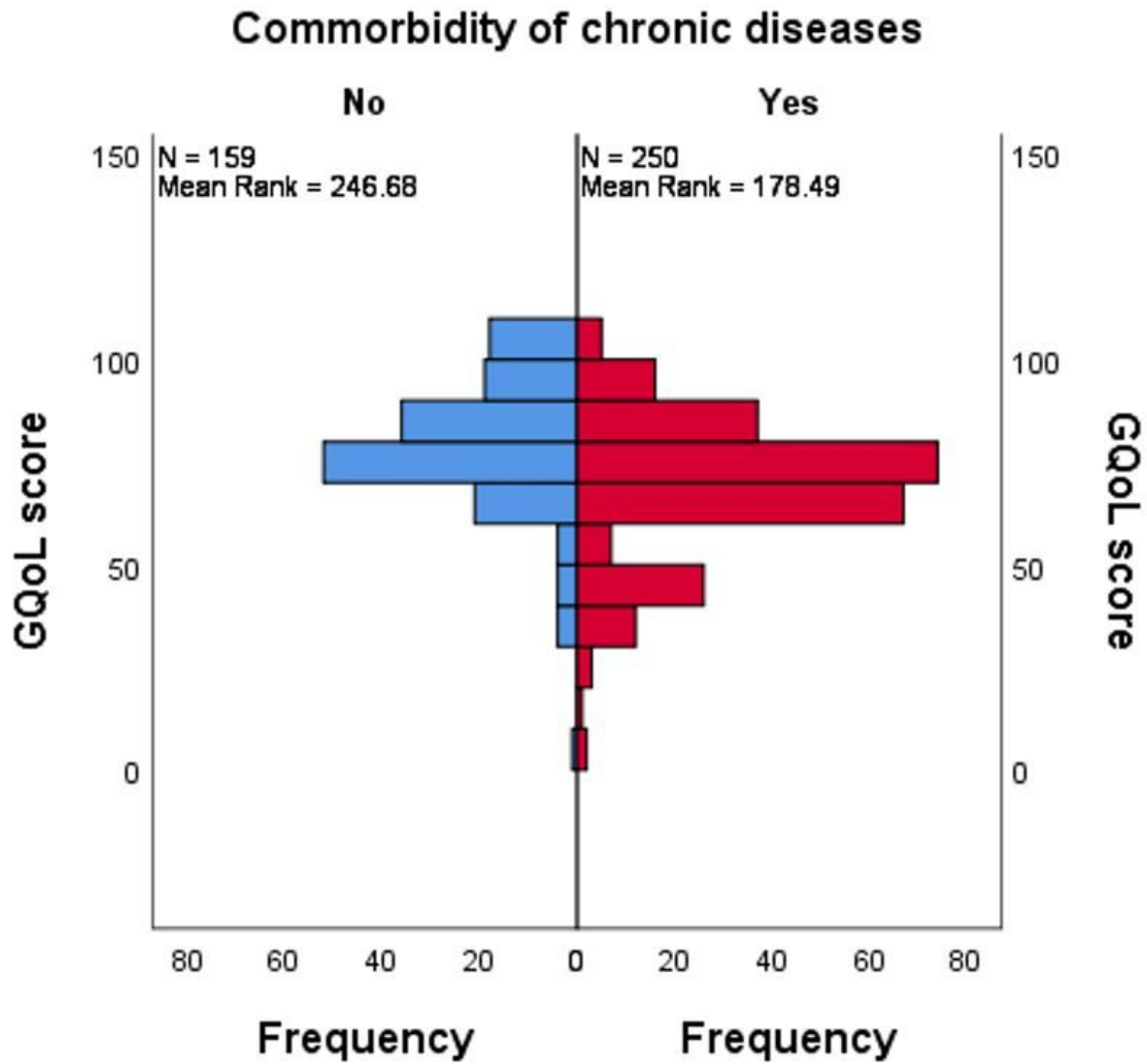


Figure 1

Mean rank difference of GQoL between single versus any additional chronic comorbidities among patients with chronic non-communicable disease visiting public health facilities during the COVID-19 pandemic in Addis Ababa, Ethiopia, August 2020.

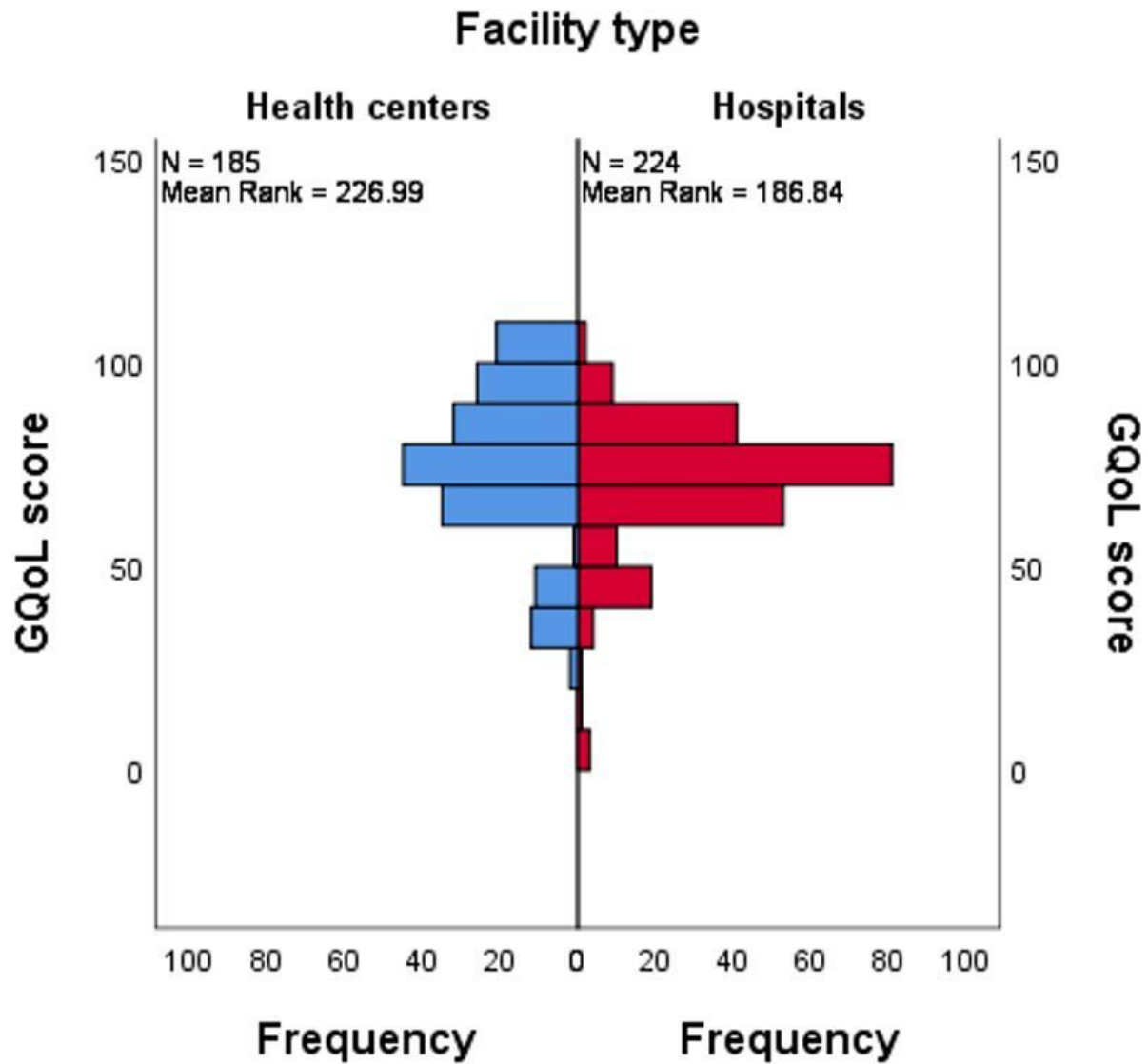


Figure 2

Mean rank difference of GQoL score between patients with chronic non-communicable diseases attended at health centers versus hospitals during the COVID-19 pandemic in Addis Ababa, Ethiopia, August 2020.