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Health-related quality of life and associated factors among individuals with heart failure attending public hospitals in Nekemte town, Western Oromia, Ethiopia: a cross-sectional study

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Abstract

Background Heart failure has a significant impact on patients' health-related quality of life (HRQOL), affecting their physical, emotional, and social well-being. Understanding HRQOL in this population is crucial for guiding patient-centered care and improving outcomes. Despite the potential importance of assessing the health-related quality of life among people with heart failure, to the best of our knowledge, there are a limited number of studies on this topic in Ethiopia to date, which limits the generalizability of the findings. Therefore, this study assessed the health-related quality of life and associated factors among people with heart failure attending public hospitals in Nekemte town, western Ethiopia.

Methods A hospital-based cross-sectional study was conducted from May 20 to August 20, 2023; a random sampling method was used to enroll the 422 participants. Health-related quality of life was assessed using the Minnesota Living with Heart Failure Questionnaires standard tool. Data was coded and entered using Epi-Data version 4.6 and exported to SPSS software version 26 for cleaning and analysis. Bivariable and multivariable logistic regressions analyses were employed to determine the independently associated with factors influencing health-related quality of life among people with heart failure. Adjusted Odds Ratio with 95% CI was used to determine the strength of the association.

Results A total of 422 individuals living with heart failure participated in the study. Overall, 51.2% (95% CI: 47.15–52.36%) experienced poor health-related quality of life. Rural residency AOR = 3.34, 95% CI (1.82, 6.13), lack of formal education AOR = 2.92, 95% CI (1.17, 7.32), NYHA classes III and IV AOR = 3.76, 95% CI (2.03, 6.96) and 4.91 (2.45, 9.90), respectively, longer duration with heart failure AOR = 3.52, 95% CI (1.22, 10.13), and with other comorbid illnesses AOR = 2.89, 95% CI (1.40, 5.97) were associated with poor health-related quality of life among people with heart failure.

Conclusions More than half of individuals living with heart failure in this study experienced poor health-related quality of life. Rural residence, lack of formal education, advanced NYHA functional class (III and IV), longer duration

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of heart failure, and presence of comorbid illnesses were significant factors contributing to poor HRQOL. Therefore, Clinicians should prioritize early identification and management of patients from rural area, with lower education levels, advanced disease stages, prolonged illness, and multiple comorbidities to enhance patients' quality of life.

Keywords Health-related quality of life, Heart failure, Minnesota living with heart failure questionnaires, Ethiopia

Introduction

Heart failure is a long-term and worsening condition that occurs when the heart muscles are unable to pump enough blood to meet the body's metabolic demands. It is a severe and potentially life-threatening illness marked by significant morbidity and mortality and reduced functional capacity, which affects more than 64 million people across the globe and demands careful management and timely medical intervention [1]. It is a complex multifactorial syndrome caused by impaired cardiac function [2]. It is a clinical syndrome that has been recognized for decades as the leading cause of the cardiovascular disease burden in sub-Saharan Africa [3].

The rapid increase in the number of people with heart failure increases the stress and social disease-related/medical economic burden on individuals and their families, leading to poor prognosis and potentially reducing health-related quality of life among people with heart failure [4].

Heart failure (HF) is a progressive and debilitating disease that significantly affects patients' daily lives and reduces opportunities to participate in social life, leading to less social interaction, aloneness, social isolation, and a lack of social support to carry out daily activities, which lead to poor health-related quality of life [5].

It is a significant public health problem that impacts health-related quality of life among people living with heart failure [6].

The World Health Organization (WHO) defines quality of life (QOL) as "feeling one's place in life about goals, aspirations, standards, and concerns in the context of the culture and value system in which one lives" [7]. Quality of life is defined by the WHO's Quality of Life Team as people's perceptions, expectations, and concerns. This definition reflects the idea that quality of life refers to a subjective evaluation [7, 8].

Health-related quality of life is "an individual's or a group's perceived physical and mental health over time and components of patient-related outcomes that include physical, psychological, and social aspects of life" [9]. Health-related quality of life is the perception that people have of their subjective health, considering health measures of their physical and mental health [10]. It is an approach that evaluates a patient's health and well-being based on their own perception, focusing on aspects of life not directly caused by their medical condition [11].

Health related quality of life is frequently used in research to represent the patient's view point. One intervention may be preferred over another as a result of the high value placed on the results of quality-of-life assessments. Health-related quality of life and perceived health status are frequently utilized components of patient-based outcomes, which include physical, psychological, and social facets of life [9]. Health-related quality of life: people with heart failure present with various physical and emotional symptoms such as dyspnea, fatigue, edema, sleep disturbances, depression, and chest pain [12].

Heart failure is a severe, life-threatening disease characterized by significant morbidity and mortality, affecting more than 64 million people worldwide [1]. It affects a patient's physical, social, mental, and emotional well-being which leads to poor health-related quality of life among people living with heart failure [13]. Heart failure negatively affects all aspects of life, as manifested by a poor health-related quality of life that may lead to long-term morbidity and mortality [14].

In the Kingdom of Bahrain, most people living with heart failure reported 74.8% as having poor health-related quality of life [13]. Another study conducted in Portugal found that 45% of participants had poor health-related quality of life among people living with heart failure [15]. A study conducted in Jordan reported that 47.2% of the participants had poor health-related quality of life among people living with heart failure [16].

In Africa, people with heart failure often report a very poor health-related quality of life because heart failure harms all aspects of life, especially symptom burden, which can limit the person's ability to perform normal activities [17]. In Ethiopia, two studies were conducted, in the Woliata Zone and at the University of Gondar Tertiary Hospitals, on health-related quality of life and associated factors among people with heart failure. They reported that 50% and 41.61% of participants had poor health-related quality of life, respectively [18, 19].

People with heart failure present with various physical and emotional symptoms such as dyspnea, fatigue, edema, sleep disturbance, depression, and chest pain, which may limit the patient's daily physical and social activities and lead to a poor health-related quality of life [12]. Most hospitalized heart failure patients had poor health-related quality of life, and nearly half have poor self-care habits [20]. Poor quality of life correlates with increased hospitalization occupancy and mortality rates, as well as higher costs to health systems, families, and patients [21]. The health-related quality of life of people

with heart failure was affected by factors such as age, gender, New York Heart Association functional class, level of education, the presence of social support, and depressive symptoms [22].

The Heart Failure Guidelines 2022 provide recommendations for the treatment of these people based on current evidence for the management of people with heart failure, aimed at slowing disease progression, prolonging survival, reducing symptoms, and enhancing function by improving the quality of life among people with heart failure [23].

Guidelines-recommended medical and behavioral interventions for heart failure, such as exercise and cardiac rehabilitation, self-care interventions, treatment of depression, and various medical, surgical, and non-medical interventions, can help to maintain or improve the quality of life for people with heart failure [24].

Therefore, this study aimed to examine the health-related quality of life and associated factors among people with heart failure attending public hospitals in Nekemte Town, Western Ethiopia, in 2023.

Methods and material

Study design

An institution-based descriptive cross-sectional study was conducted.

Study setting and population

The was conducted at Wallaga University comprehensive and specialized Referral Hospital and Nekemte Comprehensive Specialized Hospital from May 30 to August 30, 2023. Both hospitals are located in Nekemte, 331 km west of the Ethiopian capital Addis Ababa [25]. Wallaga University comprehensive and specialized Referral Hospital is one of the government hospitals in Nekemte Town. It serves as the referral and teaching hospital for western Ethiopia. This hospital belongs to Wallaga University, which began to give service on May 11, 2017. Nekemte Comprehensive Specialized Hospital is a comprehensive public hospital providing various healthcare services, including diabetes care, surgery, medical and obstetrics, and gynecology, and pediatric and neonatal services. The catchment population of the hospital is 3.5 million, and it is a referral service center for about 11 million people in western Ethiopia [26]. In both hospitals, people with heart failure receive healthcare on medical follow-up in the hospital and undergo monthly follow-up. The number of people living with heart failure attending Wallaga Referral Hospital, it is 240, and at Nekemte Comprehensive Specialized Hospital, it is 752, with a total of 992. The study populations were those systematically selected adult individuals with CHF who had follow-up at Wallaga University comprehensive and specialized Referral Hospital and Nekemte Comprehensive Specialized Hospital during the study period. We included those participants living with heart failure, aged 18 years and above, attending the study hospitals for at least six months, and in a stable medical condition and excluded if they had a hearing and speaking problem.

Sample size determination and sampling procedures

The Sample size for this study was determined using single population proportion formula, by assuming 95% confidence interval, 1.96 standard normal variables (z-score) with a 5% marginal error and $P = 50\%$, proportion of poor health-related quality of life among people with heart failure is taken from study conducted in Wolaita Zone Governmental Hospitals, Ethiopia [18], Finally adding 10% of non-response rate, the final sample size becomes 422.

Sampling technique

First, the monthly patient flow for each hospital was determined using the patients' appointment lists. The total number of heart failure people attending follow-up at the two hospitals were 992. A systematic random sampling technique was then applied, where every 442 patient was selected for interview. Accordingly, every 2 consecutive patient attending follow-up was interviewed until the required sample size of 422 was reached. The first patient was selected at random. Patients' medical charts were reviewed at the end of each day. To minimize errors during chart review, patient charts were coded during the interview. If a patient had two follow-up appointments during the data collection period, their appointment dates were checked, and they were excluded from the interview to avoid duplication.

Data collection tools and procedures

Data were collected using the standardized and validated Minnesota Living with Heart Failure Questionnaire (MLHFQ). The MLHFQ is a disease-specific tool designed to measure health-related quality of life in individuals with heart failure. It consists of 21 items, with a total score ranging from 0 to 105. The questionnaire includes two key dimensions: physical (8 items, score range 0–40) and emotional (5 items, score range 0–25). The remaining eight items (out of 21 totals) are only taken into account for the total score [18, 27]. A validated and reliable Arabic version of the MLHFQ — with a Cronbach's alpha coefficient of 0.92 — was previously used [28]. Additionally, this tool has been validated for use in the Ethiopian context for assessing quality of life in patients with heart disease, demonstrating excellent reliability (Cronbach's alpha = 0.95) [18].

The questionnaire has six parts: socio-demographic questions, self- management questions to assess the participants' clinical characteristics, questions to assess the

participants' behavioral characteristics, questions related to the presence of social support.

Self-management practices were measured using nine items of the European Heart Failure Self Care Behavior Scale tool, and the total score ranges from 9 to 45, with higher scores indicating poor self-care [29]. A validated Korean version of the 9-item EHFScBS was utilized, with a Cronbach's alpha of 0.84 [30]. Social support was measured by a multidimensional scale that contained 12 items from 1 (very strongly disagree) to 7 (very strongly agree) as well as scores for three dimensions: family support (four items, 1, 2, 3, and 4), friend support (four items, 5, 6, 7, and 8), and other support (four items, 9, 10, 11, and 12) [31]. A validated Thai Version of the multidimensional scale of perceived social support with Cronbach's alpha of 0.91 [32].

An interviewer-administered structured questionnaire was used to collect necessary data from the study participants. Four trained BSc nurses were recruited as data collectors, and the researchers were as supervisors. Orientation was given to the data collectors, outlining the study's objectives, data collection techniques, procedures, and description of the questionnaire. The data collectors were also instructed to inform the study participants about the study's purpose and to obtain their voluntary consent before conducting interviews.

Dependent variable

Health-related quality of life.

Independent variables

The independent variables include the socio-demographic variables: age, sex, place of residence, marital status, education level, occupation, number of family members per house, and income. Clinical characteristics variables: NYHA class, duration of heart failure, and presence of comorbidity. Behavioral practices: smoking, salty foods consumption, and alcohol consumption. Presence of social support: family support, friend support, other support, and self-management practice.

Data quality assurance

The questionnaire was pre-tested by the principal investigator on 5% of the participants using similar populations one week before actual data collection took place. The questionnaire was tested for its clarity, understandability, and completeness. Any ambiguity, confusion, difficult words, and differences in understanding were checked based on pretest experience.

The questionnaire was translated into the Afaan Oromoo (local language) and re-translated into English by experts to ensure its consistency. Each question was checked for completeness, omitted values, and uncertain answers on the spot.

Measurements

Good HRQOL is defined as when the patient scored a mean score on the Minnesota Living with Heart Failure Questionnaire (MLHFQ) of < 45 [33].

Poor HRQO Poor is defined as when the patient scored a mean MLHFQ score of ≥ 45 [33].

Self-management practice: It refers to 'the practical ability of a patient to deal with chronic illnesses, including symptoms, treatment, physical and social consequences and lifestyle changes' in a week [34].

Good self-care: patient responses less than mean value of European Heart Failure Self-Care Behavior Scale (EHFScBS) [35].

Poor self-care: patient responses greater than mean value of EHFScBS [35].

Comorbidity is defined as the presence of one or more disorders in addition to the index disease [36].

Alcohol consumption as measured by the alcohol screening test. Total score risk level: 0–10 low-risk level, 11–26 moderate risk level and 27 + high-risk levels [37].

Social support is defined as the real resources provided by others that enable a person to feel cared for or when family members and friends are involved in the care process [31, 38, 39].

Low perceived social support Score (12–35), Medium perceived social support (36–60), and High perceived social support (61–84) [31].

Data processing and analysis

Data was checked visually for its completeness, consistency, and the questionnaires were coded and entered using Epi-Data version 4.6 and exported to a statistical package of social science software version 26 for cleaning and analysis.

Data analysis was performed using descriptive and inferential statistics. Normality was checked by histogram, scatter plot, Q-Q plot, and Kolmogorov-Smirnow. Respondents' Sociodemographic characteristics, clinical characteristics, behavioral practices, presence of social support, and self-management practice scores have been analyzed using univariable statistics. Multi-collinearity was checked using variance inflation factors (1.03–1.55) among predictor variables. Bivariable logistic regression was used to determine statistical associations between a set of independent and outcome variables. Variables with a *P*-value < 0.25 in bi-variable logistic regression analysis were included in multivariable logistic regression to determine the factors that influence health-related quality of life. Crude and adjusted odds ratios with corresponding 95% confidence intervals were computed, and statistical significance was declared at a p-value < 0.05 [40]. Model fitness was checked using the Hosmer-Lemeshow test. Descriptive statistics was computed through percentage, frequency, median and Interquartile range,

and results were summarized and presented by texts, tables, and figures.

Results

Socio-demographic characteristics of participants

A total of 422 participants were interviewed, giving a 100% response rate. One hundred thirty (30.8%) of the respondents were aged sixty and above. More than half (57.3%) of the respondents were female. One hundred eighty-eight (44.5%) of the participants were rural residents. Most (96.4%) of the respondents were married. More than two-thirds (69.9%) of the participants had up to five household family sizes. One hundred thirty-nine (32.9%) of participants were illiterate, and 164 (38.9%) of respondents earned an average monthly income of up to 3000 ETB (Table 1).

Clinical characteristics of the respondents

More than one-fourth (28.7%) of participants were categorized as NYHA class III, and eighty-six (20.4%) were categorized as NYHA class IV. Most of the participants (91.7%) had less than 48 months' duration of heart failure. Only 16.1% of the participants had any comorbidity with any other illness. Hypertension was found to be the most prevalent condition among the participants (7.3%) (Table 2).

Behavioral practice, self-management, and social support of the respondent

Salt consumption, behavioral practice, self-management, and social support of the respondent were identified. Among all participants, 119 (28.2%) of the respondents were used salt after being diagnosed with heart failure. Twenty-five (5.9%) of the respondents had poor self-management, and almost 395 (93.6%) of the respondents perceived medium social support (Table 3).

Health-related quality of life of the respondents

In this study, 422 participants were assessed on the health-related quality of life among people with heart failure. The median and interquartile ranges were 48 and 48.25, respectively. Among those study subjects, two hundred sixteen (51.2%), with a 95% CI (47.15, 52.36)

Table 1 Socio-demographic characteristics of people with heart failure attending public hospitals, in Nekemte, Western Ethiopia, 2023, (*N* = 422)

Variables	Categories	Frequency	Percent (%)
Age (years)	20–29	15	3.6
	30–39	75	17.8
	40–49	127	30
	50–59	75	17.8
	+60	130	30.8
Sex of respondents	Female	242	57.3
	Male	180	42.7
Place of residence	Urban	234	55.5
	Rural	188	44.5
Marital Status	Single	11	2.6
	Married	407	96.4
	Divorced	4	1.0
Family size per household	< 5	295	69.9
	+5	127	30.1
Level of Education	Illiterate	139	32.9
	Writing and reading only	21	5.0
	Primary school (1-8grade)	44	10.4
	Secondary school (9–10 grade)	43	10.2
	Preparatory (11-12grade)	67	15.9
	Diploma and above	108	25.6
Occupation status	Private employee	145	34.4
	Farmer	27	6.4
	House wife	170	40.3
	Student	8	1.9
	Government employee	72	17.0
Monthly income (ETB)	< 3000	164	38.9
	3000–6000	136	32.2
	6001–9000	77	18.2
	> 9000	45	10.7

Table 2 Clinical characteristics of the participants attending at public hospitals, in Nekemte, Western Ethiopia, 2023, (*N* = 422)

Variables	Categories	Frequency	Percent (%)
NYHA Classification	II	215	50.9
	III	121	28.7
	IV	86	20.4
Duration of diagnosed with heart failure in months	< 48	387	91.7
	+ 48	35	8.3
Having another comorbid illness	Yes	68	16.1
	No	354	83.9
Types of comorbid illness	Hypertension	31	7.3
	Diabetes	16	3.8
	Asthma	21	5.0

Table 3 Behavioral practice, self-management and social support of study participants attending at public hospitals, in Nekemte, Western Ethiopia, 2023, (*N* = 422)

Variables	Categories	Frequency	Percent (%)
Use salt, after you diagnosed with HF	Yes	119	28.2
	No	303	71.8
Self-management practice	Good	127	30.1
	Poor	295	69.9
Level of social support	Low	25	5.9
	Medium	395	93.6
	High	2	0.5

of participants, were assessed as having a poor health-related quality of life due to heart failure (Fig. 1).

Factors associated with quality of life among the participants

A Bivariable and multivariable logistic regression model was used to identify factors associated with poor health-related quality of life among people with heart failure. In Bivariable logistic regression analysis, variables with a *P* value < 0.25 were selected for the multivariable logistic regression model. These variables were age, sex, place of residence, level of education, occupation, monthly income (ETB), NYHA classification, duration of heart failure in months since diagnosis, another comorbid illness, and use of salt after being diagnosed with heart failure. Model fitness was checked using the Hosmer-Lemeshow test.

In multivariable analysis, after controlling for potential confounders, rural residence, level of education, NYHA classification stages III and IV, duration of being diagnosed with heart failure in months, and other comorbid illness variables were significant predictors of poor health-related quality of life at a *P* value of < 0.05.

Participants who were living in rural areas were about 3 times more likely to have a poor health related quality of life compared to those who were from urban areas, AOR with a 95% CI [3.34 (1.82, 6.13)].

Respondents who had no formal education were around three times more likely to have a poor health related quality of life compared to those who had an educational level of diploma and above AOR, with a 95% CI of [2.92 (1.17, 7.32)].

Study participants who were in stage III and stage IV NYHA classification were 3.7 and around 4 times more likely to have a poor health-related quality of life compared to those in stage II NYHA classification AOR with 95% CI [3.76 (2.03, 6.96)] and [4.91 (2.45, 9.90)], respectively.

Study subjects who were diagnosed with heart failure after 48 or more months were three times more likely to have poor health-related quality of life compared to those who were diagnosed in less than 48 months (AOR with 95% CI: [3.52 (1.22, 10.13)].

Participants who had another comorbid illness were around 3 times more likely to have a poor health-related quality of life compared to their counterparts. AOR with 95% CI: [2.89 (1.40, 5.97)] (Table 4).

Discussion

This research aimed to assess health- related quality of life and associated factors among people with heart failure attending public hospitals in Nekemte town, Western Ethiopia, and to identify the relationship between quality of life among people with heart failure and selected demographic variables. According to the results of this study, it was found that heart failure had an impact on quality of life. Socio-demographic factors such as place of residence, level of education, clinical characteristic factors such as NYHA classification stages III and IV, duration of being diagnosed with heart failure in months, and

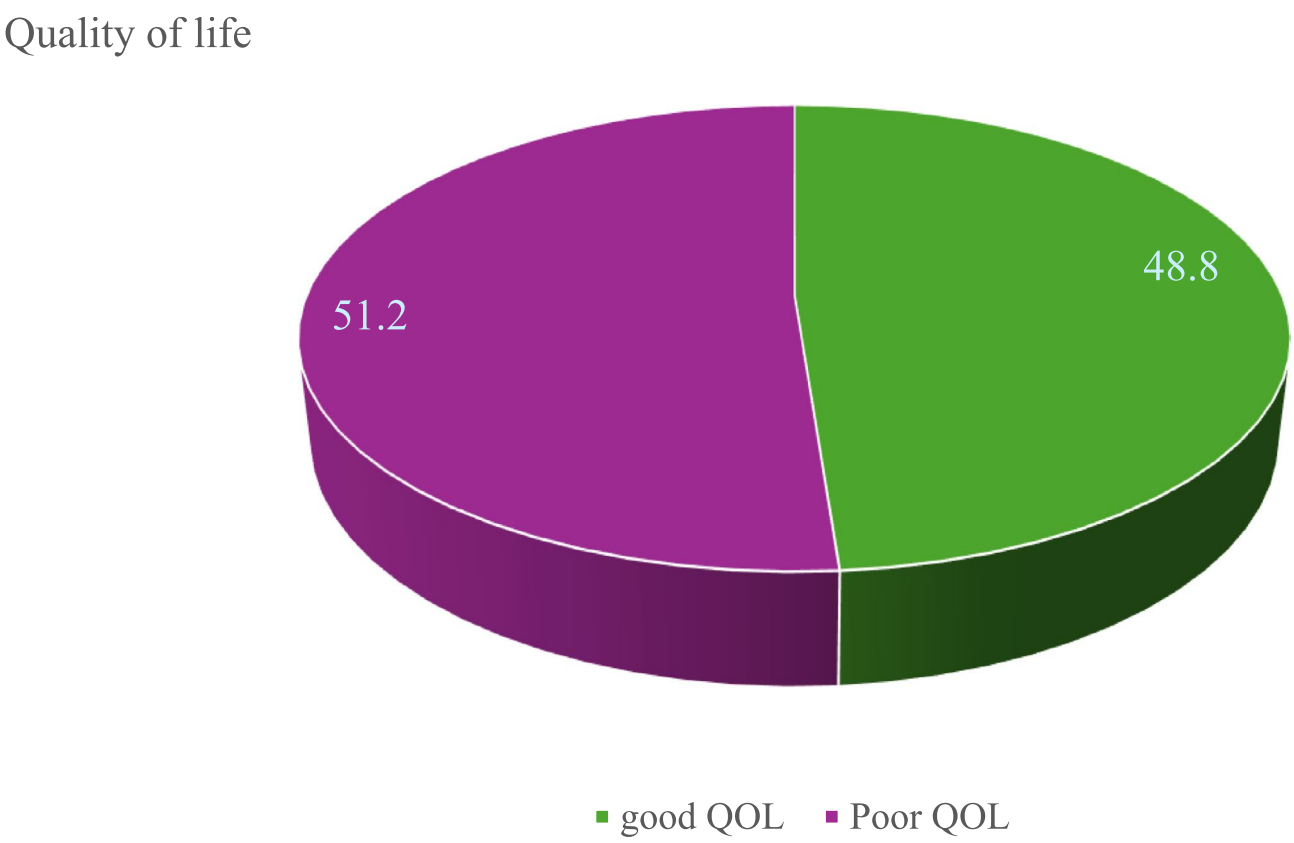

Fig. 1 The pie diagram showing the distribution of health-related quality of life among people with heart failure attending public hospitals, in Nekemte, Western Ethiopia, 2023

other comorbid illnesses had a significant association with poor health- related quality of life among people with heart failure. Improving the life-year gain is not the sole objective of heart failure management. It also aims to enhance the health related quality of life and reduce disability among people living with HF [41].

The overall total score of poor health -related quality of life among people living with heart failure was 51.2% (95% CI: 47.15–52.36). This result is consistent with a similar study conducted at Wolaita Zone Governmental Hospitals and the University of Gondar referral hospital, which showed that 50% and 51.8% of the participants had poor health-related quality of life among people living with heart failure, respectively [18, 20]. This study also consistent with study conducted in Jordan that reported 47.2% of participants had poor health-related quality of life among people with heart failure [16]. This may be due to health-related quality of life based on personal opinions or feelings, various physical and emotional symptoms such as dyspnea, fatigue, edema, sleep difficulties, depression, chest pain due to heart failure which may be attributed to poor health-related quality of life among people living with heart failure [42, 43].

This finding is higher compared to studies conducted at the University of North Carolina and in Portugal [15, 44]. This difference may be due to socio-economic among developed and developing countries meaning that developed countries are those that are highly industrialized, have strong economic growth, and Citizens have high standards of living. However, developing countries are those that are not industrialized and have lower standards of living which may be attributed to poor health-related quality of life among people with heart failure in Ethiopia [45].

Besides, this finding is lower compared to the study conducted in the Kingdom of Bahrain at public hospitals [13]. In the Kingdom of Bahrain, variables such as advanced age, divorce, and widowed were significantly associated with poor health-related quality of life among people with heart failure [13]. But in this study these variables were not significantly associated with poor health related quality of life among people with heart failure. This difference may increase poor health related quality of life in Kingdom of Bahrain at public hospitals. This finding is also lower compared to the study conducted in Egypt [17]. This difference may be because, in Egypt, the public health system encounters numerous challenges, such as inadequate funding, poor quality care, insufficient medical resources, and a lack of trained personnel [46]. But in Ethiopia this issues is not similar with Egypt

Table 4 Bivariable and multivariable logistic regression analysis of factors associated with quality of life among people with heart failure attending public hospitals of Nekemte town, 2023, *N* = 422

Variables	Category	Quality of life		COR(95%CI)	*P*- Value	AOR(95%C)	*P*-Value
		Good	Poor				
Age (years)	20–29	10	5	1		1	
	30–39	54	21	0.78 (0.24, 2.55)	0.678	0.34 (0.07, 1.66)	0.180
	40–49	73	54	1.48 (0.48, 4.58)	0.497	0.66 (0.14, 3.10)	0.599
	50–59	27	48	3.56(1.10,11.49)	0.034	2.18(0.44,10.80)	0.341
	+60	42	88	4.19(1.35,13.03)	0.013	2.30(0.49,10.85)	0.292
Sex	female	104	138	1.74 (1.18,2.56)	0.006	0.70 (0.35, 1.44)	0.335
	Male	102	78	1		1	
Place of residence	Urban	153	81	1		1	
	Rural	53	135	4.81 (3.17,7.30)	0.001	3.34(1.82,6.13)*	0.001
Level of Education	Illiterate	40	99	9.15(5.06,16.49)	0.001	2.92(1.17,7.32)*	0.022
	Writing and reading only	7	14	7.39(2.67,20.45)	0.001	2.47 (0.64, 9.58)	0.192
	Primary school	19	25	4.86(2.29,10.33)	0.001	2.09(0.70, 6.18)	0.184
	Secondary school	21	22	3.87(1.82,8.24)	0.001	1.63 (0.54, 4.88)	0.385
	Preparatory	34	33	3.59 (1.85, 6.97)	0.001	1.70 (0.65, 4.46)	0.283
	Diploma and above	85	23	1		1	
Occupational status	Private emp.	85	60	2.68 (1.39, 5.18)	0.008	1.18 (0.39, 3.53)	0.772
	Farmer	8	19	9.03(3.31,24.60)	0.001	1.08 (0.22, 5.31)	0.922
	House wife	51	119	8.87(4.60,17.10)	0.828	1.96 (0.59, 6.54)	0.272
	Student	5	3	2.28 (0.49, 10.64)	0.003	1.83(0.22,15.06)	0.574
	Govern't employee	57	15	1		1	
Monthly income (ETB)	< 3000	66	98	5.20(2.41,11.21)	0.001	2.07(0.67, 6.38)	0.205
	3000–6000	54	82	5.32(2.43,11.62)	0.001	1.91 (0.62, 5.94)	0.262
	6001–9000	51	26	1.78 (0.77, 4.16)	0.180	0.84(0.28, 2.51)	0.756
	> 9000	35	10	1		1	
NYHA Classes	II	134	81	1		1	
	III	47	74	2.61 (1.65,4.12)	0.001	3.76(2.03,6.96)*	0.001
	IV	134	61	4.04 (2.35, 6.93)	0.001	4.91(2.45,9.90)*	0.001
Duration of Dx with HF in months	< 48	199	188	1		1	
	+48	7	28	4.23 (1.85,9.93)	0.001	3.52(1.22,10.13)*	0.020
Another comorbid illness	Yes	21	47	2.45(1.41, 4.27)	0.002	2.89(1.40,5.97)*	0.004
	No	185	169	1		1	
Used of salt, after diagnosed with HF	Yes	64	55	0.758(0.495,1.160)	0.201	0.69 (0.38, 1.24)	0.216
	No	142	161	1		1	

*significant at *P* value < 0.05 in the multivariable logistic regression model

country. This difference may increase poor health related quality of life among people with heart failure in Egypt.

The novel observation of this study was that 21.4% of Heart failure people were less than 40 years old, which is significantly higher than the rest of the world average of approximately 3%. This difference reveals an alarming trend of heart failure progressively being common in younger populations in Western Ethiopia in accordance with the newly emerging global trends revealed in the recent literatures and reviews. The observed figure would be attributed to risk factors which are very common during young Adult hood age such as; cardio metabolic risk factors, genetic factors, environmental and life style factors. This is in line with existing literature and scientific reports, which have highlighted a number of factors behind the rising prevalence of heart failure among young adults.

Study revealed that, cardio metabolic risk factors such as obesity; type 2 diabetes, hypertension, and dyslipidaemia among young people have been found to have a high risk of Heart failure. A recent meta-analysis proved that in the young cohorts, Cardio metabolic risk factors the traditional risk factors such as obesity; type 2 diabetes, hypertension, and dyslipidaemia, were more significantly associated with Heart failure than in elderly groups [47].

The other possible reason might be genetic predispositions and familial conditions which are responsible for a substantial percentage of early-onset Heart failure, and among younger patients, up to 15–40% of the patients belong in this category [48].

Also, environmental factors such as lifestyle habits would be the possible risk factors of CHF among young adults. Research suggests common environmental and lifestyle risk factors such as The rising use of tobacco products (including Smokeless tobacco product), heavy alcohol consumption, poor diet, lack of physical activity, and excessive energy drink consumption are recognised as common among young adults; they may be the reasons for the rising incidence of heart failure among young adults [49].

The other possible reason for the number is due to the long-term effects of tossillo-pharyngitis. The antigenic mimicry in the process of inflammation leads to inflammatory heart disease such as rheumatic fever and its long-term complications, such as vascular inflammation, myocarditis, may enhance heart failure risk in young Adults [50, 51].

This study indicated that participants from rural areas had poor health related quality of life compare with participants from urban areas. These results consistent with a study conducted, at University of Gondar referral hospital, Wolaita Zone Governmental Hospitals, and Poland among people living with heart failure [18, 20, 52]. This may be due to greater distance and limited access to health care services, which results in rescheduling and skipping of appointment visits, which may be attributed to worsening, readmission, and poor health-related quality of life [52].

Besides, this study showed that no formal educational status is significantly associated with poor health related quality of life compare to those had level of education diploma and above. This finding is consistent with study done in the Kingdom of Bahrain at public hospitals and public hospitals in Mekelle, North Ethiopia [13, 53]. This may be due to education level, a crucial role in creating an interest and concern for patients regarding their health, which is essential for successful medical treatment, and people with higher levels of education are more likely to embrace lifestyle modifications and preventive measures, leading to an improvement in their quality of life [54].

According to the current study, people with higher NYHA classes III and IV were significantly associated with poor health-related quality of life compared to those with a lower NYHA classification. This finding is consistent with previous studies conducted in government hospitals in the Woliata Zone, Taiwan, Serbia, and Pakistan [18, 55–57]. This implies that people with advanced heart failure may experience frequent hospitalizations, progressive and debilitating symptoms, decreased levels of activity, complications from heart failure and heart failure therapy, and are more susceptible to the destabilization of other medical conditions, all of which can negatively impact their health-related quality of life [58].

This study shows that people with a history of another comorbid illness were significantly associated with poor health-related quality of life compare to those without a history of another comorbid illness among people living with heart failure. This result is consistent with a previous study conducted in the Netherlands and Bangladesh [59, 60].

This study shows that people with a history of another comorbid illness were significantly associated with poor health-related quality of life compared to those without a history of another comorbid illness among people living with heart failure. This result is consistent with a previous study conducted in the Netherlands and Bangladesh [61].

This study revealed that individuals diagnosed with heart failure after 48 months or more were found to experience poor health-related quality of life than those who were diagnosed within 48 months. This result is consistent with studies conducted in University of Gondar Comprehensive Specialist Hospital and Scotland among people with heart failure [19, 62]. This may be due to patients with longer-duration heart failure experiencing physical and emotional symptoms with a significantly higher event rate and the highest rate of device usage for heart failure, readmission, and reduced daily activities, which lead to poor quality of life among people with heart failure [14].

In this study, try to access health-related quality of life and associated factors among people with heart failure in the western part of Ethiopia. Health-related quality of life was assessed based on the standard tool that is validated for developed and developing countries (MLHFQ). The study was conducted through a cross-sectional study design; it cannot address or examine the causal relationship between health-related quality of life and associated factors among people with heart failure. The study utilized a self-report questionnaire to gather data, which may have introduced information bias, as participants may be affected by recall bias.

Conclusions

This study illustrates that more than half of people with heart failure have been evaluated as having poor health-related quality of life. Factors such as rural residence areas, no formal education, NYHA classes, a longer duration of heart failure, and comorbid illness were associated with worsening quality of life among people living with heart failure. So health care professionals should consider and improve the quality of life by addressing the factors associated with heart failure.

Abbreviations

EHFSCBS	European Heart Failure Self-Care Behavior Scale
HF	Heart Failure
MLHFQ	Minnesota Living with Heart Failure Questionnaire

NCSH	Nekemte Comprehensive Specialized Hospital
NYHA	New York Heart Association
HRQOL	Health-related Quality of Life
VIF	Variance Inflation Factor
WURH	Wallaga University Referral Hospital

Supplementary Information

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Supplementary Material 1.

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Author contributions
Kidane Dinku Motuma: made a significant contribution to the Conception of the study, methodology, Formal analysis, software, Investigation, acquisition of data, and writing original draft, critical review, and responsibility for the article. Firaol Regea Gelesa: Study design, methodology, Formal analysis, substantial revision of the article, and agreement on the selected journal. Matiyos Lema: contributed to the study design, statistical analysis, and interpretation. Dereje Chala Diriba (PhD): made a significant contribution to conceptualization, study design, execution of the study, data analysis, writing-review and editing of the article, and accountability for the content.

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Data availability
This study was based on primary data from people with heart failure attending public hospitals in Nekemte town, Western Oromia, Ethiopia. The dataset include responses to structured questionnaires on health-related quality of life and associated factors. The data were analyzed using SPSS version 26. Due to ethical considerations and participant confidentiality, the raw data will not be publicly available, but can be shared upon reasonable request from the corresponding author, subject to approval from the Institutional Review Board of Wallaga University.

Declarations

Ethics approval and consent to participate
The study was approved by the Institutional Review Board of Wallaga University. Formal written requests were submitted to the selected public hospitals for the study to obtain their consent before initiating data collection, and all participants provided informed consent prior to their participation. The Institutional Review Board ensured that the study met all ethical standards and that participants were fully informed about the study's purpose, procedures, potential risks, and benefits and no personal identifiers were included in the questionnaires. The collected data were securely stored, with access restricted to the principal investigators to prevent unauthorized use. The participants were assured that their involvement was entirely voluntary, with the option to withdraw at any time. Additionally, they were informed that the data would be used only for research purposes.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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