

Self-care behavior and associated factors among patients with heart failure in public hospitals of Southeast Ethiopia

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Abstract

Objective: This study was performed to assess self-care behavior and associated factors among patients with heart failure attending public hospitals in Southeast Ethiopia in 2021.

Methods: An institutional-based cross-sectional study was conducted among 420 patients with heart failure from 15 May to 30 June 2021 using a simple random sampling technique. A multi-variable binary logistic model was used to identify factors associated with self-care behavior. Statistical significance was declared at $p < 0.05$.

Results: The magnitude of good self-care behavior among patients with heart failure was 53.6% [95% confidence interval (CI), 48.9–58.3]. Factors associated with self-care behavior were treatment with a beta blocker [adjusted odds ratio (AOR), 0.49; 95% CI, 0.27–0.89], treatment with digitalis (AOR, 0.11; 95% CI, 0.05–0.24), the level of social support (AOR, 0.07; 95% CI, 0.03–0.15), and the presence of depressive symptoms (AOR, 0.21; 95% CI, 2.70–8.33).

Conclusion: Slightly more than half of the respondents had good self-care behavior. Attention should be given to enhancing good self-care practice through integration of health education as routine care.

Keywords

Self-care behavior, heart failure, patients, public hospital, beta blocker, digitalis, social support

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Introduction

Heart failure (HF) is a chronic, progressive, complex clinical syndrome in which the heart is incapable of maintaining a cardiac output that is adequate to meet metabolic requirements and accommodate venous return.¹ HF remains a rising global epidemic with an estimated prevalence of more than 37.7 million individuals globally.² In 2012, the estimated health expenditure of HF was around 31 billion dollars, which is expected to increase by 127% by the year 2030.³ HF is the leading cause of hospitalization in the United States and Europe, resulting in more than 1 million admissions per year.⁴

The mortality of patients with HF is three to four times higher in Africa than in Western countries.⁵ Particularly, in Sub-Saharan Africa, HF holds great public health importance because of its high prevalence and impact on young economically active individuals, resulting in significant disability, premature death, and loss of economic productivity.⁶ One study showed that the overall mortality rate of patients hospitalized for HF in Ethiopia was 12.7%.⁷ Another study revealed that more than 50% of patients with HF in Ethiopia had poor quality of life.⁸

Self-care is considered a cornerstone of HF treatment; it is a process of maintaining health through health-promoting practices and managing illness.^{9,10} Self-care comprises key behaviors that have been shown to improve clinical outcomes of HF. These behaviors include lifestyle modifications such as adherence to medication, a low-salt diet, exercise, fluid restriction, seeking treatment early after symptom occurrence, and daily measurement of body weight.¹¹⁻¹³ Self-care behavior (SCB) has been proven to improve patients' quality of life, reduce both economic and personal burdens, facilitate early detection of clinical problems,

and reduce the risk of rehospitalization for HF.^{14,15}

Even though international health care systems are now focusing on the reduction of rehospitalization for HF, improvement of survival, and enhancement of patients' well-being¹⁰ by recommending self-care as an integral part of routine HF management,¹⁵ many patients with HF have inadequate SCB.^{16,17} The occurrence of poor SCB is becoming a major problem in developed and developing countries. In past studies from Pakistan,¹⁸ China,¹⁹ and Iran,²⁰ the overall SCB was suboptimal; additionally, only 49.2% of patients had good SCB in Kenya.²¹

Similarly, studies in Ethiopia have shown poor self-care management practices among patients with chronic HF.^{16,22,23} For example, a study conducted in Jimma University showed that 60% of patients with HF had poor adherence to SCB.¹⁶ Factors shown to be associated with SCB among patients with HF include sex, education level, duration of HF, rate of admission, types of medication, comorbidities, knowledge of SCB for HF, depression, social support, alcohol drinking, and cigarette smoking.^{16,18-25}

Prevention and control of HF and other chronic diseases is a crucial strategy because of the overwhelmingly detrimental consequences of such diseases. One of these measures is adherence to lifestyle modifications; i.e., good SCB. Although HF is an emerging disease in Ethiopia, the practice of SCB is suboptimal. Moreover, the few studies conducted to date were limited to the northern and western regions of the country; there is no evidence from the southeastern region. SCB may vary across the country because of different sociodemographic characteristics and health-seeking behaviors. Therefore, the present study was performed to assess SCB and associated factors among patients with HF in Bale and East Bale Zone public hospitals.

The findings of this study might be used to develop strategies toward enhancement of good self-care practice.

Materials and methods

Study area and period

This study was conducted in Bale and East Bale Zones from 15 May to 30 June 2021. Bale and East Bale Zones are located in Oromia Regional State, 430 and 630 km, respectively, from the capital city (Addis Ababa). Five public hospitals are present in both zones: Madda Walabu University Goba Referral Hospital, Ginnir General Hospital, Robe General Hospital, Delo Mena General Hospital, and Madda Walabu Primary Hospital. Data were collected from all five public hospitals. In total, 705 patients with HF were undergoing follow-up in the two zones.

Study design

An institutional-based, cross-sectional quantitative study was conducted. We followed the relevant EQUATOR Network guidelines, and the reporting of this study conforms to the STROBE guidelines.²⁶

Population and eligibility

The source population comprised all adult patients with HF undergoing follow-up in Bale and East Bale Zone public hospitals, and the study population comprised all sampled adult patients with HF who attended an HF clinic for follow-up during the data collection period. All adult patients with HF aged ≥ 18 years who were undergoing follow-up and were willing to participate in the study were included, whereas seriously ill patients were excluded.

Sample size determination and technique

The sample size was determined with a single population proportion formula using the proportion of patients with good SCB among all patients with HF reported in a previous study (45.8%).²³ According to the 95% confidence interval (CI) and 5% margin of error, and by adding a 10% non-response rate, the final sample size was 420. The patients' records were listed in follow-up appointment order and used as a sampling frame. Participants were selected using a simple random sampling technique.

Study variables

The dependent variable was SCB. The independent variables were demographic characteristics (age, sex, marital status, education level, living status, occupation, and monthly income), clinical conditions [New York Heart Association (NYHA) functional class, comorbidities, admission rate, type of medication, and duration of HF], psychological factors, social support, depression, knowledge of SCB for HF, behavioral status, alcohol drinking, and cigarette smoking.

Data collection tools and methods

A structured, validated interviewer-administered questionnaire was employed, and the clinical factors were collected from the patients' medical charts using an observational checklist. The questionnaire comprised seven parts adapted from previous studies.^{9,16,21,27-29} Part I contained questions on sociodemographic characteristics (age, sex, marital status, living status, education, occupation, and monthly income). Part II was the European Heart Failure Self-care Behaviour Scale (EHFScBS). This scale contains 11 items rated from 1 (completely disagree) to 5 (completely agree).²⁸ Cronbach's alpha

was 0.922. Patients who scored greater than the mean value on the EHFSBS were categorized as having good SCB, whereas those who scored less than the mean value were categorized as having poor SCB. Part III was a modified version of the Dutch HF Knowledge Scale, which contains 15 multiple-choice questions regarding knowledge of HF among patients with HF.²⁷ Cronbach's alpha was 0.788. A score of 1 is given for the correct answer, and a score of 0 is given for the incorrect answer. Respondents who answered ≥ 10 questions correctly were categorized as having good knowledge of HF, whereas those who answered < 10 questions correctly were categorized as having poor knowledge.²³ Part IV assessed social support using the 12-item Multidimensional Scale of Perceived Social Support (MSPSS), which was scored using a 7-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree).^{23,28} Cronbach's alpha was 0.921. A mean score ranging from 1.0 to 2.9 was considered poor support, a score of 3.0 to 5.0 was considered moderate support, and a score of 5.1 to 7.0 was considered high support.^{30,31} Part V assessed depressive symptoms using the Patient Health Questionnaire-9 (PHQ-9).²⁸ The internal consistency was 0.944. A total score of > 10 points on the PHQ-9 scale was considered indicative of depressive symptoms.²⁴ Part VI assessed behavior, alcohol drinking, and cigarette smoking using yes/no options.²⁸ Part VII assessed clinical conditions according to the NYHA functional class (I–IV), comorbidities, admission rate, type of medication, and duration of HF.^{23,28}

Data quality control

To ensure the quality of the data, the data collectors and supervisors underwent 1 day of training on how to approach the study subjects and how to use the questionnaire. The data collectors were supervised by the

principal investigator and supervisors. A pre-test was conducted on 5%²¹ of the respondents among the total sample size out of the study area in Dodola General Hospital. Validity and reliability tests were performed as described in the data collection section. The completeness of the collected data was checked on a daily basis. Double data entry was performed to check for consistency, and the data were cleaned before the analysis.

Data analysis

The coded data were entered into EpiData version 3.1 and then exported to IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp., Armonk, NY, USA) for analysis. Both bivariable and multivariable logistic regression models were used to identify factors associated with SCB. A backward model-building method was used. Variables with a P value of ≤ 0.25 in the bivariable analysis were entered into the multivariable model to control for possible effects of the confounders. After checking for fitness of the logistic regression model using the Hosmer–Lemeshow test, the results of the final model were expressed in terms of the adjusted odds ratio (AOR) and 95% CI. Variables with a p-value of < 0.05 were considered statistically significant.

Ethical considerations

Ethical clearance was obtained from the ethics review committee of Madda Walabu University in Bale Zone (Ref. No. 01/2/5328, given on 22 July 2013). The research review and follow-up were in agreement with the principles of the Helsinki Declaration. A formal letter was written to all respective hospitals to ensure their cooperation. Before the data collection, a detail explanation of the aim and purpose of the study was provided to all patients involved in the study. Written consent was

obtained from each participant. Confidentiality was maintained. Data were collected anonymously and reported in aggregates. The details of all patients were de-identified. The patient data used to identify an individual are not individually identifiable.

Results

Sociodemographic characteristics

A total of 420 patients participated in the study, and the questionnaire response rate was 100%. The participants' mean age was 47.42 ± 15.89 years (range, 18–93 years) (Table 1).

Respondents' clinical characteristics, social support, behavioral characteristics, and knowledge

More than one-third [$n = 165$ (39.6%)] of the respondents had NYHA class II HF. With respect to the types of medications taken by the respondents, most [$n = 371$ (88.3%)] were taking diuretics. Nearly half of the respondents [$n = 187$ (45.5%)] had a medically confirmed comorbidity. The duration of time since diagnosis of HF was 13 to 59 months in 191 (45.5%) respondents, and 371 (88.5%) had been admitted to the hospital fewer than three times. Almost half of the respondents [$n = 206$ (49.0%)] had moderate perceived social support. Nearly three-fourths [$n = 298$ (71.0%)] had poor knowledge of SCB. More than half [$n = 236$ (56.2%)] had perceived depressive symptoms. One-fourth of the respondents [$n = 107$ (25.5%)] were ever drinkers of alcohol, and 33 (7.9%) were ever smokers (Table 2).

Participants' SCB

The overall magnitude of good SCB in the study population was 53.6% (95% CI,

Table 1. Sociodemographic characteristics of patients with heart failure in Bale and East Bale Zone public hospitals, Southeast Ethiopia, 2021 ($n = 420$).

Variables	Frequency	Percent
Age, years		
18–35	107	25.5
36–65	255	60.7
>65	58	13.8
Sex		
Male	198	47.1
Female	222	52.9
Marital status		
Single	44	10.5
Married	299	71.2
Divorced	27	6.4
Widowed	50	11.9
Living status		
Alone	34	8.1
With family	337	80.2
With non-family	49	11.7
Educational background		
Illiterate	138	32.9
Read and write	82	19.5
Primary school	57	13.6
High school and above	143	34.0
Occupation		
Government employee	94	22.4
Merchant	82	19.5
Housewife	93	22.1
Farmer	121	28.8
Others (retired, unemployed)	30	7.1

48.9–58.3). The mean SCB score was 30.74. The magnitude of good self-care among men and women was 54.0% and 53.2%, respectively (Figure 1).

Factors associated with SCB

The bivariable logistic regression analysis showed that the marital status, NYHA functional class, treatment with a beta-blocker, treatment with digitalis, number of admissions, level of social support, and presence of depressive symptoms were

Table 2. Clinical profile of patients with heart failure in Bale and East Bale Zone public hospitals, Southeast Ethiopia, 2021 (n = 420).

Variables	Category	Frequency	Percent
New York Heart Association functional class	I	55	13.1
	II	165	39.3
	III	136	32.4
	IV	64	15.2
Types of medication	Beta blockers	319	76.0
	Digitalis	316	75.2
	Diuretics	371	88.3
	Calcium channel blockers	132	31.4
	Others*	45	10.7
Comorbidities	Yes	187	45.5
	No	233	55.5
Duration of illness, months	<12	138	32.9
	13–59	191	45.5
	>59	91	21.7
Number of admissions	<3	371	88.5
	4–6	38	9.1
	>7	11	2.4
Level of social support	Poor	83	19.8
	Moderate	206	49.0
	High	131	31.2
Level of knowledge	Poor	298	71.0
	Good	122	29.0
Perceived depressive symptoms	Yes	236	56.2
	No	184	43.8
Ever alcohol drinker	Yes	107	25.5
	No	313	74.5
Current alcohol drinker	Yes	23	5.5
	No	397	94.5

*Others: atorvastatin, acetylsalicylic acid, penicillin, renin–angiotensin system inhibitors, warfarin.

significantly associated with SCB. After adjusting for potential confounding variables by running multivariable logistic regression, the independent predictors of SCB were treatment with a beta blocker, treatment with digitalis, the level of social support, and the presence of depressive symptoms were found to be independent predictors of SCB. Patients with HF who were taking a beta blocker had 51% lower odds of good SCB than those not taking a beta blocker (AOR, 0.49; 95% CI, 0.27–0.89). Similarly, patients with HF who

were taking digitalis had 89% lower odds of practicing good SCB than those not taking digitalis (AOR, 0.11; 95% CI, 0.05–0.24). Regarding social support, patients with HF who had low and moderate social support had 93% (AOR, 0.07; 95% CI, 0.03–0.15) and 72% (AOR, 0.28; 95% CI, 0.15–0.53) lower odds of practicing good SCB, respectively, than those with higher social support. Finally, the odds of having good SCB were 79% higher among patients without than with depressive symptoms (AOR, 0.21; 95% CI, 2.70–8.33) (Table 3).

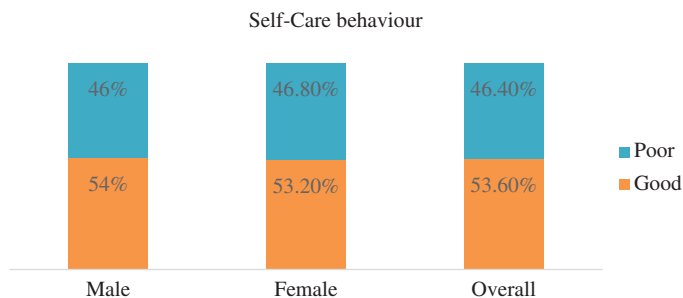


Figure 1. Magnitude of self-care behavior among patients with heart failure in Bale and East Bale Zone public hospitals, Southeast Ethiopia, 2021 (n = 420).

Table 3. Factors associated with self-care behavior among patients with heart failure in Bale and East Bale Zone Hospitals, Southeast Ethiopia, 2021 (n = 420).

Variables	Self-care behavior		COR (95% CI)	AOR (95% CI)
	Good, n (%)	Poor, n (%)		
Age, years				
18–35	62 (57.9)	45 (42.1)	2.09 (1.09–4.02)	1.25 (0.46–3.36)
36–65	140 (54.9)	115 (45.1)	1.85 (1.04–3.31)	1.79 (0.82–3.91)
≥66	23 (39.7)	35 (60.3)		
Marital status				
Single	27 (61.4)	17 (38.6)	3.08 (1.33–7.16)	3.15 (0.85–11.66)
Married	170 (56.9)	129 (43.1)	2.56 (1.36–4.79)	1.79 (0.75–4.29)
Divorced	11 (40.7)	16 (59.3)	1.34 (0.51–3.50)	1.23 (0.34–4.80)
Widowed	17 (34.0)	33 (66.0)		
Educational background				
Illiterate	61 (44.2)	77 (55.8)	0.53 (0.33–0.84)	0.93 (0.46–0.98)
Read and write	46 (56.1)	36 (43.9)	0.85 (0.49–1.47)	0.45 (0.21–0.97)
Primary school	32 (56.1)	25 (43.9)	0.85 (0.46–1.58)	0.42 (0.18–0.95)
High school and above	86 (60.1)	57 (39.9)		
NYHA functional class				
Class I	33 (60.0)	22 (40.0)	1.70 (0.82–3.53)	0.42 (0.14–1.19)
Class II	100 (60.6)	65 (39.4)	1.74 (0.97–3.12)	0.71 (0.32–1.59)
Class III	62 (45.6)	74 (54.4)	0.95 (0.52–1.72)	0.79 (0.37–1.69)
Class IV	30 (46.9)	34 (53.1)		
Beta-blocker				
Yes	161 (50.5)	158 (49.5)	0.59 (0.37–0.93)	0.49 (0.27–0.89)*
No	64 (63.4)	37 (36.6)		
Digitalis				
Yes	144 (45.6)	172 (54.4)	0.24 (0.14–0.39)	0.11 (0.05–0.24)**
No	81 (77.9)	23 (22.1)		
Diuretic				
Yes	193 (52.0)	178 (48.0)	0.58 (0.31–1.07)	1.01 (0.46–2.24)
No	32 (65.3)	17 (34.7)		

(continued)

Table 3. Continued.

Variables	Self-care behavior		COR (95% CI)	AOR (95% CI)
	Good, n (%)	Poor, n (%)		
Number of admissions				
≤3	190 (51.2)	181 (48.8)	0.45 (0.12–1.77)	0.86 (0.17–4.37)
4–6	28 (73.7)	10 (26.3)	1.20 (0.26–5.56)	1.49 (0.24–9.29)
≥7	7 (70.0)	3 (30.0)		
Level of social support				
Poor	19 (22.9)	64 (77.1)	0.09 (0.05–0.18)	0.07 (0.03–0.15)**
Moderate	106 (51.5)	100 (48.5)	0.33 (0.20–0.54)	0.28 (0.15–0.53)**
High	100 (76.3)	31 (23.7)		
Depressive symptoms				
Yes	92 (39.0)	144 (61.0)	0.25 (0.16–0.37)	0.21 (0.12–0.37)**
No	133 (72.3)	51 (27.7)		
Ever smoked				
Yes	13 (39.4)	20 (60.6)	0.54 (0.26–1.11)	0.71 (0.26–1.91)
No	212 (54.8)	175 (45.2)		
Current smoker				
Yes	1 (14.3)	6 (85.7)	0.14 (0.02–1.17)	0.13 (0.01–2.49)
No	224 (54.4)	188 (45.6)		

* $p \leq 0.005$, ** $p \leq 0.001$.

NYHA, New York Heart Association; COR, crude odds ratio; AOR, adjusted odds ratio; CI, confidence interval.

Discussion

This study was performed to investigate the magnitude of SCB and associated factors among patients with HF. The magnitude of good SCB in this study was 53.6%, which is comparable with the prevalence shown by studies conducted in Pakistan (56.5%),³² Vietnam (49.1%), Kenya (49.2%),²¹ Tigray in Northern Ethiopia (54.2%),²³ Gondar in Northwest Ethiopia (52.0%),⁸ and Wollega in West Ethiopia (51.2%).³³

It should be noted that the magnitude of good SCB in the current study was higher than that in studies conducted among patients with HF in Punjab in India (23.0%),³⁴ Iran (26.0%),³⁵ Zimbabwe (46.2%),³⁶ Jimma in Southwest Ethiopia (40.8%),¹⁶ Gondar in Northwest Ethiopia (37.7%),²⁸ and Mekelle in Northern Ethiopia (47.5%).²⁹ Conversely, the magnitude reported in this study was lower than

that in a study conducted at tertiary teaching hospitals of Ethiopia, which showed that 62.6% of respondents had good SCB.²⁷ These differences in the magnitude might be due to differences in socioeconomic factors, knowledge levels, healthcare characteristics, and data collection tools among the study populations. Other possible reasons for these differences might be the cut-off point used to ascertain good SCB and the data collection method used in the current study (i.e., an interviewer-administered tool, which might have over-estimated the magnitude).

The multivariable logistic regression analysis revealed that taking beta blocker medication, taking digitalis, having poor and moderate social support, and having depressive symptoms were significantly associated with poor SCB. The type of medication taken was found to be significantly associated with SCB. Patients with HF who

were on beta blocker medication had 51% lower odds of good SCB than those not taking beta blockers. The reason for this might be that a high medication burden leads to frustration and poor SCB. Similarly, patients with HF who were taking digitalis had lower odds of practicing good SCB than those who were not taking digitalis. No cross-reference studies are available for comparison.

The current study showed a significant association between the level of social support and SCB. Patients with HF who had low and moderate social support had 93% (AOR, 0.07; 95% CI, 0.03–0.15) and 72% (AOR, 0.28; 95% CI, 0.15–0.53) lower odds of practicing good SCB, respectively, than those with higher social support. This finding is supported by studies among patients with HF in the United Kingdom³⁷ and Iran.³⁰ Effective social support may act as a gentle guiding force that encourages behavioral change for better self-care practice. Furthermore, social and environmental factors can promote health by minimizing the adverse physiological effects of stress and providing a sense of belonging through relationship.

The current study also showed a significant association between depression and SCB. The odds of good SCB were 79% higher among patients with HF who had no depressive symptoms than among those who had depressive symptoms. This finding is in line with the results of a study performed at Jimma University Specialized Hospital by Beker et al.¹⁶ and cardiac centers in Addis Ababa, Ethiopia by Tegegn et al.³⁸ Depression may increase the burden of patients' overall clinical condition, making the patients less likely to follow the recommended SCB practice.

In general, the findings of this study contribute valuable clinical implications. Nurses can use these findings to develop a nursing care plan to teach patients with HF about the components of good SCB. Our

findings will alert all stakeholders in promoting good SCB, hence increasing quality of life, reducing re-hospitalization, and minimizing cost at the individual and family levels. This findings can be generalized to the public hospitals of Bale and East Bale Zones in Southeast Ethiopia.

This study has some limitations that should be kept in mind when interpreting the results. First, the cross-sectional nature of the study design does not confirm a definitive temporal relationship between the dependent and independent variables. Second, this study included a relatively high percentage of illiterate patients, which might have been the reason for the low magnitude of good SCB. Third, the etiology and phenotype of HF were not evaluated as factors contributing to SCB, and an economic analysis of the effect of the factors on SCB was not performed. Moreover, because of the sensitive nature of the questions, social desirability bias might have been introduced; it is likely that the respondents deliberately over-reported the magnitude of SCB. Finally, the responses for some of the factors analyzed were associated with the patients' history, and this might have introduced recall bias.

Conclusion

Good SCB is very important for patients with HF to prevent and minimize the adverse outcomes of HF. This study showed that the magnitude of SCB among patients with HF is only about 50%. Moreover, the present study showed statistically significant associations of taking beta blockers, taking digitalis, the level of perceived social support, and the presence of depression symptoms with SCB among patients with HF. Attention should be given to enhancing good self-care practice through integration of health education into routine care and providing comprehensive social support.

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Author contributions

All authors contributed to designing the study, developing the proposal, data analysis, drafting or revising the article, have agreed on the journal to which the article was submitted, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

Declaration of conflict of interest

The authors declare that there are no conflicts of interest for this work.

Data availability statement

The original data for this research will be available upon reasonable request.

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