Self-care behavior and associated factors among adults with heart failure at cardiac follow-up clinics in West Amhara Region Referral Hospitals, Northwest Ethiopia, 2017

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1. Background

Heart failure (HF) is a chronic, a serious progressive disease affecting > 23 million cases worldwide (Bui et al., 2011) and 5.7 million cases were in the united population (Mozaffarian et al., 2015). Annually, the global economic cost of HF was estimated at $108 billion and also it is a major public health concern for both developed and developing countries (Cook et al., 2014; Riegel et al., 2010). Heart failure is a common illness requiring multiple medications and significant self-care behavior (Seto et al., 2011). Because of the most part of this process is done at home, patients are responsible for a major part of taking care of themselves (Lee et al., 2009; Thomas and Clark 2011). Worldwide improve the survival and well-being as well as decrease hospitalizations of HF patients is a focus of healthcare (Jaarsma et al., 2013).

Self-care in patients with heart failure is referred to as methods in which patients participate in their own care and make decisions about managing the symptoms or illness signs (Riegel et al., 2011). Good self-care behavior improves the quality of life; minimize cost and re-hospitalization of HF patients (Jones et al., 2012). Despite the importance of effective self-care, many patients with HF morbidity preventive lifestyle are commonly poor, and patients have considerable difficulties performing self-care (Kato et al., 2009).

As a solution disease management and care program were studied in developed countries and as intervention especially from Spain, to promote self-care behavior performance, nursing education was warranted (Jaarsma et al., 2008; Lupón et al., 2008).

As in any other developing countries, Ethiopia is also challenged by the growing magnitude of chronic non-communicable disease (CNCDs), communicable and injury which created a triple burden on the population and the health system. High prevalence of CNCDs including hypertension, other cardiovascular diseases in both rural and urban parts of the country is a major concern (Agyemang and Addo, 2009). Even though there are multiple modifiable factors known to precipitate hospitalization for HF exacerbation, the two most common are non-adherence to prescribed medications and diet, and failure to seek timely medical care for growing symptoms (Riegel et al., 2011).

The prevalence of poor self-care behavior is becoming a major problem in developed and developing countries. In Iran was 17.6% to 5.5% (50.9%) (Shojaei et al., 2011; Kamrani et al., 2014). Whereas from African Nations the prevalence of poor self-care was higher like in Zimbabwe were 53.8%, from Kenya (50.8%), also in Ethiopia (59.2%) were reported (Manwere et al., 2013; Beker et al., 2014).

Different scholars identified different predictors that influence self-care behavior in patients with heart failure (HF), such as male in gender, low educational level and living status, disease severity, duration of heart failure, rate of admission; types of medication, co-morbidity burden, poor knowledge on heart failure self-care behavior (HFSCB), depression, absence of social support, alcohol drinking and cigarette smoking habit are the commons one (Riegel et al., 2011; Kato et al., 2009; Feyera et al., 2015; Ng'ang'a-Oginga, 2016; Beker et al., 2014; Al-Hammouri, 2016; Wu et al., 2008).

Therefore, this study is aimed to assess self-care behavior and associated factors among adults with HF at cardiac follow-up clinics in West Amhara Region Referral Hospitals, Northwest Ethiopia.

2. Materials and methods

An institution based cross-sectional study was conducted at West Amhara Region Referral Hospitals, Northwest, Ethiopia, from March 30 to May 15, 2017. Which includes the University of Gondar teaching Referral Hospital (UOGTRH), Felegehiwot Referral Hospital (FHRH) and Deberemarkos Referral Hospital (DMRH). Each of them was served for 5–7 million peoples in their catchment area.

UOGTRH is found at the Northern part of Amhara Region in Gondar

town, FHRH is found in Bahir Dar city which is the capital city of Amhara Region and DMRH is again found East of Gojjam in Amhara Regional state. The study included all adult patients above 18 years old diagnosed with heart failure and who were on follow-up at least for three months also excluded Patients who were unable to communicate and seriously ill

The dependent variable that is Self-care behavior was measured by a validated tool contained 11-items, rated on a 5-point Likert scale ranging from 1 ("I completely agree") to 5 ("I do not agree at all") and determined by the mean score of Heart failure self-care behavior measurement, ≥ 33.65 categorized as poor self-care behavior whereas < 33.65were categorized as good self-care behavior (Beker et al., 2014).

In this study, we used different factors on independent variables such as Demographic characteristics, clinical conditions, psychosocial factors, and behavioral status.

Also in our study, we operationalized the total score of ≥6 out of a maximum 8 scores in Heart failure knowledge scale was knowledgeable on HF (Sewagegn, Fekadu, & Chanie, 2015), total score above the 10 points with patient health questionnaire 9 (PHQ-9) scale were counted as depressed (Gelaye et al., 2013) and who scored points at mean and above (≥48) for the multidimensional social support questions were referred supported from social support (Heo et al., 2008).

We operationalized for current substance use means were those who consumed substance at least once in the past 3 months and ever-substance use means if he/she was consumed only once in his/her lifetime (Feyera et al., 2015).

The sample size was calculated based on a single proportion formula by considering the assumption of 95% confidence interval 59.2% non-adherence to self-care behavior in patients with heart failure in Jimma Referral Hospital, Ethiopia (Beker et al., 2014), 5% margin of error and 10% possible non-response rate to yield the final sample size of 408. From the three hospitals there are 1395 heart failure patient. Among them proportional we allocated to UOGTRH 242, FHRH 79 and DMRH 87 patients.

We used a systematic random sampling technique (i.e. every third patient) was employed to select study participants from 1395 HF patients. The first patient was selected by lottery method. To minimize the recycling of the participants, the card was checked and color-coded were given for each patient.

Data were collected by interview using structured pretested questionnaire consist of demographic, psychosocial, Behavioral profiles and chart review for a clinical profile using a checklist that was adapted from previous studies (Kato et al., 2009; Sewagegn et al., 2015;2015.; Ng'ang'a-Oginga, 2016; Beker et al., 2014; Al-Hammouri, 2016). The questionnaire was prepared in English and translated to local language Amharic and again it was translated back to English for consistency. The study participants were approached by four BSc nurse data collectors, supervised by three MSc nurses and principal investigator. Training for data collectors and supervisors for three days was given. The pretest was conducted on 20 respondents (5%) of the total sample size, in Dessie Referral Hospital by data collectors on the same setting but different place. The collected data was checked out for the completeness on a daily basis by data cleaning and cross-checking before analysis.

Data were entered into Epi Info version 7 and transferred to SPSS version 20 for analysis. Both bi-variable and multivariable logistic regression models were used to identify associated factors of self-care behavior among adults with heart failure. Variables having P-value ≤ 0.2 in the bivariable analysis were entered into the multivariable model to control the effect of confounders. Odds ratios (OR) with their 95% confidence intervals (95% CI) were calculated to measure the strength of association. Finally, p-value ≤ 0.05 was considered statically significant.

Ethical approval was obtained from the Institutional Review Committee of School of Nursing College of Medicine and Health Science, University of Gondar. A formal letter was written to the respective hospitals for their cooperation. Before the ethical approval, the proposal was provided to reviewers to assure ethical issues. Finally, the ethical review committee approved the oral consent by considering that the research has not any harm to the study participants. Before the interview and measurements, the purpose of the study to each participant fully explained and obtained full verbal informed consent. Confidentiality was maintained at all levels of the study by making the data collection secured. Finally, the finding was disseminated to the study area.

3. Results

3.1. Socio-demographic characteristics of participants

A total of 403 eligible cardiac patients were included in the study with a response rate of 98.8%. More than half (55.8%) of them are females. The mean age of the respondents was 52.3 (± 19.1 SD) and 183 (45.4%) were above 57 age groups followed by age 48–57 years 58(14.4%). Of the respondents almost two thirds (66.5%) of them were married and, less than half (45.4%) of them were unable to read and write. Out of the respondents, 172 (42.7%) was a Farmer in their occupation.

More than one thirds (39%) of respondents had an income between 586 and 1650 Ethiopian Birr (ETB). Most of participants 342 (84.9%) reported as living with family (Table1).

3.2. Clinical condition related attributes

Based on New York Heart Association 155 (38.5%) class III and 133(33%) were in class I respectively. More than half (54.8%) of the clients had clinical symptom of CHF ≥ one-year duration and the majority of them were taking diuretics (54.1%). One hundred sixty-one (40%) participants were free from any co-morbid diseases and from the participants with chronic multi-morbidity almost half (48.6%) of them were hypertension (Table2).

3.3. Prevalence of self-care behavior

More than half of them (62.3%) were had poor self-care behavior. The mean (± SD) of HFScB score was 33.65 ± 10.92 respectively. Most poor self-care behaviors were related to the poor practice of regular physical exercise, daily weighing, and taking as easy shortness of breath (Table 3).

3.4. Psychological and behavioral attributes

Out of the total 403 respondents, 293 (72.7%) were not knowledgeable about heart failure Self-care behavior. The level of knowledge score about congestive heart failure (CHF) of study subject with minimum and maximum response was 0 and 8 respectively.

Around half of the respondents (51.1%) had a depressive symptom with minimum and maximum ranges response between 0 and 27. Out of the total 403 respondents, 235 (58.3%) were supported and 168 (41.7%) were not supported by family as well as nonfamily. The mean and SD level of social support score about CHF of study subject was 51.12 ± 29.24.

Out of the total 403 respondents almost Half (51.1%) of them ever drinker of alcohol, 66 (16.4%) of them were a current drinker of alcohol. Out of the respondents 64 (15.9%) were ever smoked and from 20 (5%) of participants currently smoked also 9 (45%) were smoked 6–10 cigarettes per day (Table 4).

3.5. Factors associated with poor self-care behavior

On binary logistic regression educational level, NYHA functional

Table 1

Socio-demographic characteristics of respondents attending cardiac follow-up clinics at West Amhara Region Referral Hospitals, Northwest Ethiopia, March 30 to May 15/2017 (n = 403).

Variables	Categories	Frequency	Percent (%)
Age in years	18–27	52	12.9
	28–37	46	11.4
	38–47	64	15.9
	48–57	58	14.4
	58$^+$	183	45.4
Sex	Male	178	44.2
	Female	225	55.8
Marital status	Single	49	12.2
	Married	268	66.5
	Divorced	31	7.7
	Widowed	55	13.6
Living status	Alone	53	13.2
	With family	342	84.9
	With non– family	8	2.0
Educational status	Unable to read & write	183	45.4
	Can read and write	83	20.6
	Primary School	71	17.6
	High School & above	66	16.4
Occupation	Governmental	49	12.2
	Merchant	45	11.2
	Housewife	107	26.6
	Farmer	172	42.7
	Other	30	7.3
Monthly Income (ETB)	> 586	136	20.8
	586–1650	157	39
	1651–3145	119	29.5
	3146–5195	26	6.5
	5196–7758	8	2.0
	7759–10833	9	2.2

Key:- ETB = Ethiopian Birr.

Table 2

Clinically related attributes of clients with CHF attending cardiac follow-up clinics, at West Amhara, Northwest Ethiopia, March 30 to May 15/2017 G.C. (n = 403).

Variables	Categories	Frequency	%
NYHA class	I	168	41.7
	II	67	16.6
	III	115	28.5
	IV	53	13.2
Types of Medications	Beta-blocker	60	14.9
	Digitalis	53	13.2
	Diuretics	218	54.1
	Ca channel blockers	66	16.4
	Others	6	1.5
Comorbidity	None	213	52.9
	HTN	66	16.4
	DM	65	16.1
	KD	26	6.5
	HTN + DM	8	2.0
	HTN + KD	11	2.7
	DM + KD	6	1.5
	Others	8	2
Duration of HF	< 1 year	182	45.2
	≥ 1 year	221	54.8
Number of Hospitalization	No	111	27.5
	Once	181	44.9
	Twice	49	12.2
	three times	46	11.4
	Four times and above	16	4.0

Key:- NYHA = New York Heart Association, HTN = hypertension, DM = diabetes mellitus, KD = Kidney Disease.

class, duration of CHF since diagnosis, social support, knowledge and depressive symptom were associated with self-care behavior. However in multivariable logistic regression NYHA functional class, duration of CHF, and psychological attributes (knowledge and Depressive

Table 3

Mean of HF self-care behavior item scores in rank order adults with HF attending cardiac follow-up Clinics in West Amhara Region Referral Hospitals, Northwest Ethiopia, March 30 to May 15/2017 G.C. (n = 403).

Rank	Self-care behavior	Mean score
1	I exercise regularly	4.62
2	I weigh myself every day	4.44
3	If I get short of breath, I take it easy	4.30
4	If my shortness of breath increases, I contact	4.07
5	If my feet/legs become more swollen than usual, I contact a doctor	3.90
6	If I experience increased fatigue, I contact my doctor or nurse	3.89
7	I take a rest during the day	3.74
8	If I gain 2 kg in 1 week, I contact my doctor or nurse	3.60
9	I limit the amount of fluids I drink (not > 1–1.5 L/d)	2.21
10	I eat low salt	2.04
11	I take medication as prescribed	1.58

Table 4

Behavioural and psychological attributes of adults with HF attending cardiac follow-up Clinics in West Amhara Region Referral Hospitals, Northwest Ethiopia March 30 to May 15/2017 G.C (n = 403).

Variables	Categories	Frequency	%	Remark
Knowledgeable	Yes	110	27.3	
	No	293	72.7	
Depressive symptom	Present	206	51.1	
	Absent	197	48.9	
Social Support	Yes	235	58.3	Mean = 51.2
	No	168	41.7	SD = 29.24
Ever drunker of alcohol	Once drink in lifetime	206	51.1	
	Never drink	197	48.9	
Current drinker of alcohol	Yes	67	16.4	
	No	336	83.6	
Drunken types of alcohol	local beer (Tela,Tej & Arraki)	56	89.4	
	Alcohol (Beer and others)	7	10.6	
Smoker	Yes	64	15.9	
	No	339	84.1	

symptom) had significant association at 95% confidence level.

Patients who had CHF (< 01 Year) were 4.89 [AOR (95% CI = 2.76, 8.65) p = 0.00] times more likely to had poor self-care behavior when compared to patients with duration of CHF > 01 Year since diagnosis.

Patients with NYHA functional class I, II & III were 4.55 [AOR (95% CI = 2.36, 8.78) p ≤ 0.001], 3.59 [AOR (95% CI = 1.45, 8.92) p = 0.01] & 2.58 [AOR (95% CI = 1.38, 4.79) p ≤ 0.001] times more likely to had poor self-care behavior respectively than NYHA functional class IV.

Those respondents who had not knowledgeable were 1.86[AOR (95% CI = 1.09, 3.19) p = 0.02] times more likely to had poor self-care behavior when compared to the knowledgeable respondents.

The participants who had depressive symptom were found 1.58 [AOR (95% CI = 1.00, 2.48) p = 0.04] times more likely to had poor Self-care behavior than those who had no depressive symptom (Table 5).

4. Discussion

According to this study, more than half of CHF participants (62.3%) with 95% CI (57.1%, 68%) had poor self-care behavior. This finding was in line with other studies done in Jimma, Ethiopia (59.2%) (Beker et al., 2014). The possible explanation might be the use of a similar setting and existence of an equal level of health care system program in the two hospitals. Hence those may contribute to having the same poor

Table 5

Bivariable and multivariable logistic regression output for factors associated with poor self-care behavior in patients with HF at cardiac follow-up clinics in West Amhara Region Referral Hospitals, Northwest Ethiopia, March 30 up to May 15/2017 (n = 403).

Variables		Self-care behavior		COR [95%C.I.]	AOR [95%C.I.]	P-value
		Poor	Good			
Educational level	Unable to read & write	117	66	1.77(1.00,3.13)	1.60(0.79,3.23)	0.19
	able read & write	55	28	1.96(1.01, 3.81)	1.39(0.65, 2.99)	0.20
	Primary School	46	25	1.84(0.93, 3.65)	1.55(0.7,3.43)	0.29
	≥High School	33	33	1	1	
NYHA functional	I	97	36	3.91(2.15, 7.10)	**4.55(2.37,8.78)**	**0.00*****
	II	28	11	3.70(1.61, 8.51)	**3.59(1.45,8.92)**	**0.01****
Class	III	95	60	2.30(1.31, 4.02)	**2.58(1.38,4.79)**	**0.00*****
	IV	31	45	1	1	
Duration of HF	< 1 year	109	24	4.09(2.48, 6.77)	**4.89(2.76,8.65)**	**0.00*****
	> 1year	142	128	1	1	
Social Support	No support	111	57	1.32(0.88, 2.00)	0.72(0.44,1.19)	0.21
	Supported	140	95	1	1	
Knowledge	Not knowledgeable	196	97	2.02(1.29, 3.16)	**1.86(1.09,3.19)**	**0.02***
	Knowledgeable	55	55	1	1	
Depressive symptom	Present	143	63	1.87(1.24, 2.81)	**1.58(1.00,2.48)**	**0.04***
	Absent	108	89	1	1	1

Key:- AOR: Adjusted odds ratio, COR: crude odds ratio, CI: confidence interval, NYHA: New York heart association, *: P ≤ 0.05, **: p ≤ 0.01,***: p ≤ 0.001

self-care behavior status towards Heart failure in resource-limited setting.

Whereas the result of this finding was higher than the findings in Kenya (50.8%) (Ng'ang'a-Oginga, 2016), Zimbabwe (53.8%) (Manwere et al., 2013), Iran it ranges from 17.6% to 5.5% (Shojaei et al., 2011; Kamrani et al., 2014).

Even if, Kenya and Zimbabwe had found in the sub-Saharan Africa there may be a better health care system or the patient may have a better awareness than our study population. The inconsistency of this finding with Vietnam and Iran studies might be explained by the existence of different study population, healthcare systems such as the difference in availability of structured patient health educational programs, technologies and low patient burden which put considerable strain on available medical resources.

Regarding factors associated with poor self-care behavior in this study, duration of CHF less than one year were 4.89 [AOR (95% CI = 2.76, 8.65) p ≤ 0.001] times more likely to had poor self-care behavior when compared to patients with duration of CHF > 1 year since diagnosis. This result was supported by studies, long duration of HF diagnosis was had good self-care (Riegel et al., 2011) and by prior local studies done from Jimma, Ethiopia, participants with less duration of heart failure (< 1year) were less likely adherent to self-care behavior (Beker et al., 2014). The possible justification, the experience might produce better awareness in the importance of a change from baseline health status.

Those with NYHA functional class I, II and III were 4.55 [AOR (95% CI = 2.36, 8.78) p ≤ 0.00], 3.59 [AOR (95% CI = 1.45, 8.92) p = 0.01], 2.58[AOR (95% CI = 1.38, 4.79) p ≤ 0.00] respectively times more likely to had poor self-care behavior than NYHA functional class IV. This finding was supported by studies in Ethiopia (Beker et al., 2014). The possible justification might be a patient with the more severe disease may be more initiated to know and connect with self-care with the intention of preventing disease worsening. However, this is not supported by another study suggested that patients with less severity of illness had good self-care behavior (Riegel et al., 2011).

In this study, participants with not knowledgeable were 1.86 [AOR (95% CI = 1.09, 3.19) p = 0.02] times more likely to had poor self-care behavior than who had the knowledge, which suggests the need for creative approaches to providing information for patients with this situation. The finding of this study was supported by the local area in Jimma, Ethiopia (Beker et al., 2014). This may be due to increasing knowledge about the disease may create an opportunity to increase the knowledge about self-care behavior. But in the studies conducted from Japan, they found that the knowledge of HF self-care behavior was not related to poor self-care behavior (Kato et al., 2009). The different in Japan to our study might be due to socioeconomic and environmental difference can influence the self-care behavior.

The other finding of this study was shown that patients with depressive symptom were found 1.58 [AOR (95% CI = 1.00, 2.48) p = 0.04] times more likely to had poor Self-care behavior than those who had no depressive symptom. The result of this finding was in line with the studies conducted in the local area from Jimma, Ethiopia (Beker et al., 2014). This may implicate that participants with no depressive symptom may have a chance to perform self-care than others.

The outcome of this study gives insight into self-care behavior in patients with CHF. Duration of HF since diagnosis, NYHA functional class, knowledge on HF self-care behavior and depression were identified as the top factors of self-care behavior that may play the role for the improvement. This consideration gives important information for building effective actions to improve self-care behavior in patients with CHF at cardiac follow-up clinics in West Amhara Region Referral Hospitals, Northwest Ethiopia 2017 G.C.

Limitations: first because of the cross-sectional study design, cause and effect relationships between different variables were not determined. Secondly, there may be information biases due to self-reporting self-care behavior.

5. Conclusion and recommendations

Self-care behavior is essential for patients with HF to perform and achieving the best feasible health outcomes. In this finding self-care behavior was found to be poor among HF patients and more than half of participants with CHF had poor self-care behavior. NYHA functional class, knowledge of HF self-care behavior, symptoms of depression and durations of CHF were identified as factors associated with poor self-care behavior. West Amhara Referral Hospitals need efforts to target and encourage self-care strategies to improve their self-care behavior among adults with heart failure and facilitate treatment of depression among heart failures by linking to the psychiatry department. And health care providers also shall encourage by providing well-designed client/family education on all recommended self-care components and shall emphasize on the impact of interventions targeting those subgroups noted to be at higher risk of poor Self-care. Finally, researchers should conduct a further study with a different approach (observational, cohort) in this study area as well as different parts of the country for further exploration of the problem.

6. Authors' contribution

Kassahun Gebeyehu has carried out the manuscript from its conception, analysis, and interpretation of data and drafted the manuscript.

Mohammed Hassen & Debrework Tesgera participated in reviewing the proposal, tool evaluation, interpretation and critical review of the draft manuscript. All authors read and approved the final draft of the manuscript.

7. Competing interests

Authors declare that there are no competing interests!

8. Declarations

Ethics approval and consent to participate

9. Availability of data and material

The data and materials used in this study are available from the corresponding author on reasonable request.

Ethical approval

Ethical clearance was obtained from the ethical review committee of School of Nursing

College of Medicine and Health Sciences, University of Gondar and consent was taken from participants

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijans.2019.100148.

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