



Effect of Educational Intervention on Knowledge, Self-Care Behaviors and Quality of Life among Patients with Chronic Heart Failure

Mohammed Al Shamsi^{1*} and Hamza Chehade²

¹HOD Nursing Suhar Hospital Suhar, Oman

²Lebanon Registered Nurse, Beirut Arab University, UAE

***Corresponding author:** Dr. Mohammed AlShamsi, Queen's University Belfast, UK Unit Manager OR Acting HOD Nursing Suhar Hospital Suhar, Oman, Tel No: +968 26 840399; Email: m1halshamsi@outlook.com

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Abstract

Background: Heart failure (HF) is a growing healthcare problem, associated with reduced quality of life, poor outcomes, and significant economic burden. Although thorough comprehensive guidelines related to HF disease is present, yet still we witness morbidity, mortality, and hospital readmission rates in increasing manner; In addition there is no good adherence to the guidelines in hands the issue which led to the negative impact on quality of life experienced by heart failure patients. Maintaining a good quality of life remains a core issue to be addressed in heart failure patients.

Objective: The purpose of this study was to examine the effect of educational intervention on knowledge, self-care behaviours and quality of life among patients with chronic heart failure.

Subject and Methods: a quasi-experimental research design was conducted at Makassed General Hospital, Beirut, Lebanon. A convenient sample of eighty patients with chronic heart failure were selected and sequentially assigned to two equal groups, intervention group which included 40 patients who had received the nursing educational sessions in addition to the routine hospital care. Control group that included 40 patients who had received the routine hospital care only. Three tools were used to collect the required data. Heart Failure Patients' Knowledge Questionnaire, the European Heart Failure Self-care Behaviour Scale (EHFScBS), and the Minnesota Living with Heart Failure Questionnaire (MLWHF).

Results: Patients in the intervention group had significantly better QoL in the first and fourth months after discharge.

Conclusion: The study concluded that the educational intervention had improved the knowledge, self-care behaviours and the quality of life among chronic heart failure patients.

Keywords: Heart failure; Health care; Quality of life; Morbidity; Mortality

Abbreviations: MLWHF: Minnesota Living with Heart Failure Questionnaire; EHFSBS: European Heart Failure Self-care Behaviour Scale; HF: Heart Failure; QoL: Quality of Life; WHO: World Health Organization; CHF: Congestive Heart Failure; MGH: Makassed General Hospital

Introduction

Heart Failure (HF) has been defined as global pandemic, since it affects around 26 million people worldwide [1]. It accounts for most deaths of all cardiovascular diseases [2]. Approximately 25% of patients with HF are readmitted within 30 days following hospital discharge, and 50% are readmitted within 6 months of discharge [3]. The 30-day hospital readmission rate for patients with HF in the United States is currently reported to be 24.7% [4]. These high rates of readmission are capturing attention as subsequent hospitalizations lead to worsening morbidity and mortality, decreased quality of life (QoL), and increase costs of care [5]. Readmissions may be secondary to improper or ineffective treatments, the education strategy used, a lack of patient participation in the medical regimen, the lack of knowledge related to or the inability to perform self-care behaviors, or the failure on the part of the patient to take action in order to prevent further decomposition [6,7]. Currently there is no data in Lebanon to support impact of nursing education on patient's knowledge, self-care behaviors and quality of life (QoL).

Background

Heart failure impacts over 26 million worldwide [8]. And also more than 15 million people in Europe Approximately 500,000 people in Canada, and 277,800 people in Australia [9]. According to the report of the WHO in 2010, the top ten causes of death in Lebanon include many cardiovascular diseases that may have been associated with HF. According to patient enrollment records in May 2014, 60 HF patients per month were admitted to cardiac units at Makassed General Hospital (MGH), Beirut, Lebanon.

Heart failure is the inability of the heart to pump sufficient blood to meet the needs of the tissues for oxygen and nutrients. In the past, HF was often referred to as congestive heart failure (CHF), because many patients experience pulmonary or peripheral congestion. Heart failure is a pathophysiologic state in which an abnormality of cardiac function is responsible for inadequate systemic perfusion [10]. It is not an event or disease but rather a constellation of signs and symptoms that represent the final pathway of a heterogeneous group

of diseases, the end result of most cardiovascular disease states [7].

Education encourages adherence to medical recommendations, thereby making treatment more effective [11]. Therapeutic interventions combined with an educational sessions have been linked to improvement in patients' self-care behavior, increased awareness of self-care abilities in patients with HF disease [12]. Knowledge makes treatment more effective, and contributes to positive health outcomes [11]. Conversely, lack of knowledge leads to low compliance and is a major contributor to poor QoL and hospital readmissions [13].

Patient education is generally recognized as an important component of comprehensive management programs for chronic conditions, and there has been an increasing interest in the role of patient education for optimizing the management of HF [14].

Previous studies have shown a relationship between lower knowledge levels in HF patients and various aspects of QoL, such as lower levels of physical functioning and adaptation, poorer general health ratings, and higher anxiety [15]. With the availability of sophisticated therapies a high portion of hospitalizations and complications of chronic HF could still be avoided; these adverse events are due to treatment interruption or inappropriate management related to failure to educate the patients about the disease [16].

In addition to knowledge, there is another essential factor related to QoL in patients with HF, is self-care [17]. Self-care refers to the behaviors that individuals use to manage condition, and promote health. Several studies proved that self-care behaviors among HF patients are considered low than it should be [18,19]. Since 1948, when the World Health Organization defined health as being not only the absence of disease and infirmity but also the presence of physical, mental and social well-being, QoL issues have become steadily more important in health care practice and research [20]. Quality of life is a sense of well-being, resulting from an individual's satisfaction or dissatisfaction with what they consider important in their life [21]. Quality of life is a patient's subjective perception of a disease's effect on activities of daily living [21]. QoL reflects the way a person's mental and physical well-being is evident in their everyday life [22].

Eventually, it has to be stressed that patient education, focused on knowledge, and self-care behavior can significantly improve QoL [23]. Healthcare providers must continue to be creative in encouraging patients to feel

empowered in taking control over their health by proper education, and consequently living their lives in a best possible quality. Encouraging patients to actively participate in their own care, make informed choices about treatment and health care behavior, and engage in self-care with competence and confidence will consequently lead to better QoL [24].

Materials and Method

Design

This was a quasi-experimental research design performed in the Medical units at Makassed General Hospital, Beirut, Lebanon at four wards, each consists of 20 beds, located on the 1st and 6th floor.

Participants

A convenient sample of eighty patients with chronic heart failure were distributed randomly into two equal groups: **Group I (intervention group)**, included 40 patients who received the nursing educational sessions in addition to the routine hospital care. **Group II (control group)**, included 40 patients who received only the routine hospital care. Individuals were ineligible to participate if they had illnesses that may affect negatively their QoL e.g., neoplastic diseases, mental illnesses, and epilepsy. Those who included in the study were adult patients of both sexes, and aged not more than 65 years. Able to communicate. Diagnosed with HF of class II or III, not more than 3 years ago. Ethics committee approval was obtained from IRB at Beirut Arab University and all participants provided informed consent prior to participating.

Tools of the study

The study comprised three tools: "Heart Failure Patients' Knowledge Questionnaire", "The European Heart Failure Self-care Behavior Scale (EHFScBS)", and "The Minnesota Living with Heart Failure Questionnaire (MLWHF)".

Tool I: "Heart Failure Patients' Knowledge Questionnaire": The tool was adopted from "Universidade do Estado de Santa Catarina". It proved to be scientifically appropriate and has satisfactory clarity and validity indices. The purpose of this tool is to appropriately assess the HF patients' knowledge about their own disease. It too long to administer during clinical trials or practice. It aims to assess any change in the quality of life of subjects under study. It includes 21 questions focusing on the impact of heart failure on QoL. Patients are asked to rate the extent to which their heart failure has prevented them from living as they wanted during the last month using

questions rated on a scale of 0 (no effect) to 5 (very much).

The questionnaire is scored by summing the responses to all 21 questions; thus resulting in a score from 0 to 105 with a higher score reflecting poorer quality of life. Whereas, 53 indicates average quality of life score, 52 and below indicates good quality of life, 54 and above indicates poor quality of life. The results are commonly reported as a summary score rather than presenting responses to individual questions. It consists of 19 items, each one divided into ten areas of importance for the patients' education. The items were divided according to the content proposed as follows, HF pathophysiology, HF concept, Risk factors, Signs and symptoms, Lifestyle, Diagnosis, Drugs and treatment, Self-care and physical exercise. Maximum scoring value is 19 which indicate that all answers are right and the patient has best base of knowledge concerning the disease. Score 9 and 10 reveal average knowledge about the disease. Score above 10 indicates good base of knowledge, and that below it indicates poor base of knowledge. Patient's health profiles including: name, age, sex, marital status, education, occupation, time of onset and duration of HF were attached to Tool I [25].

Tool II: "The European Heart Failure Self-care Behavior Scale (EHFScBS)": The tool was adopted from HF unit in Spain. It is a valid and reliable scale developed in a European population to measure self-reported self-care behavior of heart failure patients, and has the ability to differentiate between patients with and without additional education. It aims to measure heart failure patient's change in their self-care behavior over time. It covers items concerning self-care behavior of patients with heart failure; for example, daily weighing, fluid restriction, and exercise or contacting a health care provider. The score from each item ranges from 1 (completely agree) to 5 (completely disagree). Score "12" indicates the best possible self-care behavior, whereas a score of "60" indicates the worse self-care behavior. "36" reveals average score of self-care behavior. Lower than that, indicates good self-care behavior as well as greater than that indicates bad self-care behavior.

Tool III: "The Minnesota Living with Heart Failure Questionnaire (MLWHF)" The tool was adopted from University of Minnesota [26]. The MLWHF is a validated, disease-specific, self-administered questionnaire. The content of the (MLHFQ) was selected to be representative of the ways heart failure and proper nursing education can affect the key physical, emotional, social and mental dimensions of quality of life without being cooperative enough to fill out the 3 questionnaires consecutively.

Others needed to have a rest time between filling questionnaires. The approximate timing consumed to fill the questionnaires was about 10 minutes.

Procedure

An official permission to conduct the study was obtained from Beirut Arab University (BAU) Institutional Review Board, and responsible authorities at BAU and Makassed General Hospital (MGH). The three tools for data collection had been translated into Arabic. Translated tools are reversed into English to compare and contrast the translated Arabic version against the main English version. The educational material had been developed by the researcher in the form of PowerPoint presentation, in addition to a booklet. Both included, basic information concerning: Heart failure (definition, etiologies, diagnostic findings, signs and symptoms, and treatment); Diet and fluids; Activity and exercises; Medication; Smoking cessation.

The tools and the educational material had been tested for content validity after translation by a jury of 5 experts in the field of nursing and related fields; after which the necessary modifications done accordingly. Patients met the inclusion criteria had been selected and introduced randomly to each group;

Group I was the intervention group, whereas **group II** was the control group. The purpose of the study was explained to each participant and an informed consent for the participation had been obtained. A pilot study had been carried out on 5 patients in order to test feasibility, clarity, and the applicability of the study tools and accordingly, modifications were done.

Assessment phase for patients in both groups: Patients health profiles which included: name, age, sex, marital status, education, occupation, time of onset and duration of HF, was collected using Tool I. - Assessment of patients' knowledge, self-care behavior, and quality of life was done using Tools I, II and III subsequently on the second day after admission and after receiving the treatment and being stabilized. It had been carried out at patients' rooms on individual bases using the interview method. Also, it was conducted at different time intervals, according to patients' conditions and tolerance. Certain patients were able and cooperative enough to fill out the 3 questionnaires consecutively. Others needed to have a rest time between filling questionnaires. The approximate timing consumed to fill the questionnaires was about 10 minutes.

The intervention phase for patients in group I (Intervention group) Educational intervention provided, in addition to the routine hospital care. The educational sessions: The educational sessions had been introduced either individually or in small groups based on the patients' educational level. The sessions was individualized for those who were illiterate or uneducated, while in small groups (maximum 4 patients) for those with high educational level. The educational sessions were divided on three subsequent parts provided through PowerPoint presentation. The first part included general information about the disease, the second one included knowledge about self-care behavior comprising diet, medication, and smoking, whereas, the third one included knowledge about activity and exercises. The time taken for each session ranged between 30 to 45 minutes. The individualized sessions was carried on at the patients' rooms using a personal computer, while a small auditorium offered by the nursing administration had been used for the small groups' sessions. A reinforcement session for the educational material had been provided the day before discharge, with provision of a booklet for each patient for retention of information. Group II patients (control group), received only their routine hospital care which was limited to the information provided by the physician regarding medication and diet.

Reassessment phase for patients in both groups Reassessment of patients' knowledge, self-care behavior and quality of life was done using Tools I, II and III subsequently one month after discharge (second assessment) and three months after discharge (third assessment) , in the cardiac out-patient clinic. Second and third assessment completed by either contacting the patients directly in the cardiac out-patient clinic or by filling the questionnaires via phone calls.

Statistical Design

In this study, SPSS (Statistical Package for the Social Sciences) version 17 was used for statistical analysis. The collected data were organized, coded, and transformed into coding sheets and the results were checked. Then, the data were entered into system files. Demographic data were represented by their counts and percentages and Continuous data by mean and standard deviation.

Pearson correlation test was used to study the correlation between the health profiles of the patients in both groups with their knowledge, self-care behavior, and quality of life. On the other hand, Descriptive statistics were conducted using mean $\pm$ SD and frequency or percentages.

A p-value equal to or less than 0.05 was considered significant.

Results

Age

The highest percentage (62.5%) of patients in intervention group were in the age group (50 < 60), a percentage of 17.5% were in the age group (40 < 50) and about 20% were in the age group (60 < 65). On the other hand half (50%) of the patients in the control group were in the age group (50 < 60), whereas a percentage of 14% were in the age group (60 < 65) and the lowest percentage (10%) were in the age group (40 < 50) (Table 1).

Sex

More than half (57.5%, 55%) of the patients in the intervention and control group respectively were male and the rest (42.5%, 45%) respectively were females.

Marital status

The higher percentage (70%) in intervention group and the majority (82.5%) in control group were married. While, 30% in intervention and 17.5% in control group were single.

Education

Equal percentages (35%) in both intervention and control group were educated and the rest 65% were uneducated. In intervention group, the highest percentage (43%) had primary school degree, 36% had secondary degree, and the lowest percentage (21%) had bachelor degree. On the other side, equal percentages (36%) of patients in control

group had primary school and secondary school degree, and the rest (28%) had bachelor degree.

Occupation

Less than half of the patients in intervention and control group (42.5%, 47.5%) respectively were not working. While of those who were working, about 40% in the intervention group and 42.5% in the control group were hard workers. Only 17.5% in intervention group and 10% in the control group were regular workers.

Onset of manifestations of HF

The highest percentage (45%) of patients in intervention group had HF manifestations since 4 days, about 30% since 1 day, 20% since 2 days, and only 5% since 3 days. In the control group, equal percentages of patients (37.5%) had HF manifestations since 1 day and 4 days respectively, about 22.5% had since 2 days, and only 2.5% had since 3 days.

Duration of HF

The majority of patients in intervention and control group (92.5%, 90%) respectively, had HF (6 month< 1 year). About 5% in the intervention group and 10% in the control group had HF (1<2 years). Only 2.5% in intervention group and non in the control group had HF (2-3 years).

Class of HF

The higher percentages (65%, 60%) in intervention and control group respectively had Class II HF, while 35% of patients in intervention group, and 40% of those in control group had class III HF.

Health Profiles	Intervention Group		Control Group	
	N= 40	%	N= 40	%
Age				
40< 50	7	17.5	4	10
50 < 60	25	62.5	20	50
60 ≤ 65	8	20	16	40
Sex				
Male	23	57.5	22	55
Female	17	42.5	18	45
Marital Status				
Single	12	30	7	17.5
Married	28	70	33	82.5
Education				
Educated	14	35	14	35
Primary school degree	6	43	5	36
Secondary degree	5	36	5	36

Bachelor degree	3	21	4	28
Uneducated	26	65	26	65
Occupation				
None	17	42.5	19	47.5
*Regular Worker	7	17.5	4	10
*Hard Worker	16	40	17	42.5
Onset of manifestations of HF				
1 day	12	30	15	37.5
2 days	8	20	9	22.5
3 days	2	5	1	2.5
4 days	18	45	15	37.5
Duration of HF				
6 months < 1 year	37	92.5	36	90
1 < 2 years	2	5	4	10
2 - 3 years	1	2.5	0	0
Classification of HF				
Class II	26	65	24	60
Class III	14	35	16	40

Table 1: Health profiles of patients in intervention and control groups.

Figure 1 Showed that the total mean knowledge score was 2.55 for patients in intervention group and 1.8 for those in control group before education. The mean score then increased dramatically in intervention group (12.4) and slightly in control group (3) 1 month after discharge.

Likewise, mean score of both groups continued to increase but noticeably in intervention group (12.73) and very slightly in control group (3.2) 3 months after discharge.

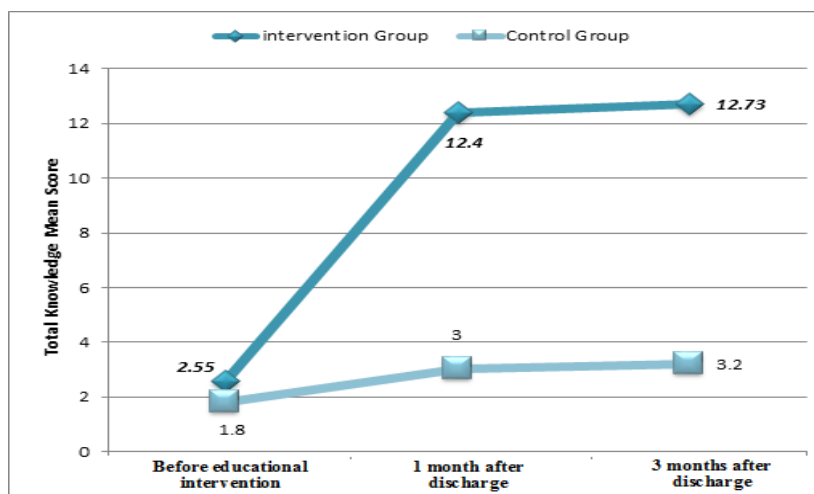


Figure 1: Knowledge scores and percentages regarding heart failure in intervention and control groups before implementing the educational intervention, 1 month, and 3 months after discharge.

Figure 2 Showed that the total mean self-care behavior score was 46.63 for patients in intervention group and 43.18 for those in control group before receiving education. The mean score then decreased dramatically in intervention group (26.85) while decreased very

minimally in control group (42.43) 1 month after discharge. Likewise, mean score of both groups continued to decrease but noticeably in intervention group (16.45) and very slightly in control group (40.53) 3 months after discharge.

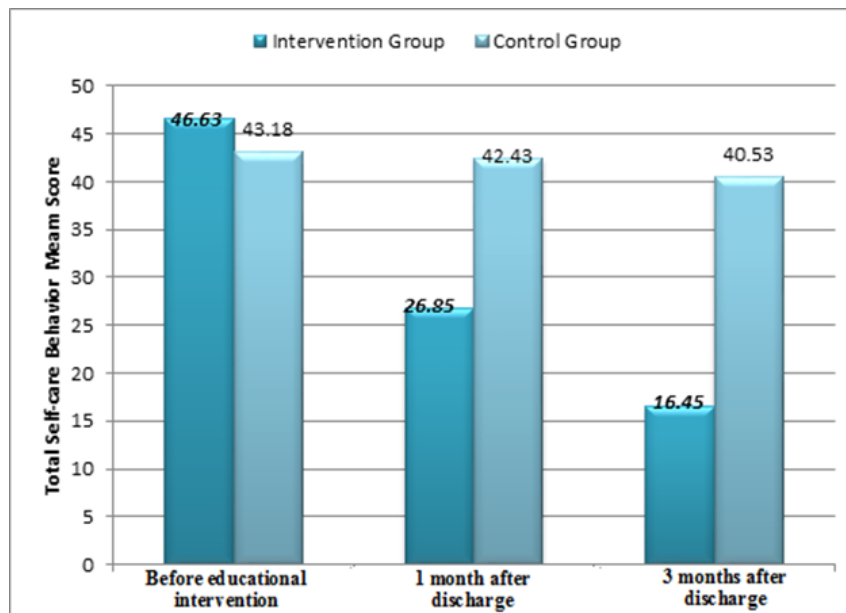


Figure 2: Self-care behavior scores and percentages regarding heart failure in intervention and control groups before implementing the educational intervention, 1 month and 3 months after discharge.

Figure 3 Showed that the total mean quality of life score was 54.78 for patients in intervention group and 58.73 for those in control group before receiving education. The mean score then decreased dramatically in intervention group (26.85) while decreased very minimally in control

group (42.43) 1 month after discharge. Likewise, mean score of both groups continued to decrease but noticeably in intervention group (16.45) and very slightly in control group (40.53) 3 months after discharge.

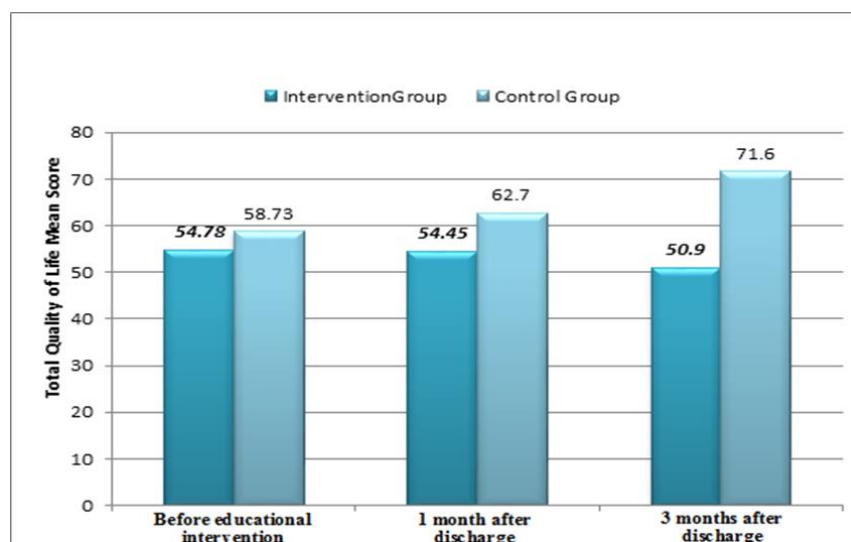


Figure 3: Quality of life scores in intervention and control groups before implementing the educational intervention, 1 month, and 3 months after discharge.

Quality of Life	Intervention Group N= 40	Control Group N= 40	t-test	P-value
	Mean $\pm$ S.D	Mean $\pm$ S.D		
Before education	54.78 $\pm$ 13.830	58.73 $\pm$ 16.161	1.174	0.2438
1 month after discharge	54.45 $\pm$ 13.721	62.7 $\pm$ 15.912	2.483	0.0152
3 months after discharge	50.9 $\pm$ 13.138	71.6 $\pm$ 16.515	6.204	< 0.001

Table 2: Quality of life scores in intervention and control groups before implementing the educational intervention, 1 month, and 3 months after discharge.

Table (3) Showed that there is a significant positive correlation between knowledge (F=43.920, P = 0.000) and self-care behavior (F=67.908, P = 0.000) in intervention and control group. On the other hand, quality of life was

not found to be correlated with knowledge and self-care behavior in intervention and control group (F=1.555, P = 0.213).

	Intervention Group N=40 Mean ± SD	Control Group N=40 Mean ±SD	F- test	P-value
Knowledge				
Before education	2.55 = 1.679	1.8 = 2.053	43920	0.000*
1 month after discharge	12.4 ±1.997	3 = 2.276		
3 months after discharge	12.73 ±2.242	2.21		
Self-care Behaviors				
Before education	46.63 2.924	43.18 3.327	67.908	0.000*
1 month after discharge	26.85 2.656	42.43 4.107		
3 months after discharge	16.451.358	40.53 4.368		
Quality of Life				
Before education	54.7813.830	58.73 16.161	1.555	0.213
—1 month after discharge	54.45 13.721	62.7 15.912		
3 months after discharge	50.9 13.135	71.6 16.515		

Table 3: Correlation between knowledge, Self-care behavior and quality of life in intervention and control group.

Discussion

Patient-centered care places an emphasis on patient education and self-care strategies geared towards informing and empowering individual patients about their diagnosis and managing their own care. Effective management of HF is one of the major challenges in health care today [27]. Non-compliance with the recommended treatment regimens is a widespread problem for HF patients, which can result in exacerbation of symptoms and hospital readmission, consequently become costly for both the patients and healthcare systems (AHA, 2009). In recent studies, non-compliance with medication and diet was shown to be responsible for 21 to 55% of readmission and increase hospital stay [28]. Other studies stated that increasing patient knowledge and the ability to recognize and manage symptoms are essential in the treatment of HF patients and major factor in enhancing their QoL. [29].

Patient education is necessary for the effective management of HF symptoms [30]. The evidence-based practice guidelines from the American College of Cardiology/American Heart Association (ACC/AHA), the Heart Failure Society of America (HFSA), and the European Society of Cardiology (ESC) recommend the patients with HF receive individualized education and counseling, placing emphasis on self-care. A findings of certain study showed a statistically significant reduction in readmissions and improvement in QoL used individually targeted patient education regarding self-care activities, activity planning, and nutrition [31].

Age

It was obvious that the highest percentages of the HF patients in both groups fall between the ages of 50 < 60 years. The lowest percentage of patients' age ranged between 40 < 50 years, and the rest of the patients were in the age between 60 $\leq$ 65 years. This result is unlike James and Edward (2012) whose study showed that, most of the heart patients' ages falls above 65 years [32]. Also,

Nahid and Genevieve (2014) found that more than half of patients with CHF are over 75 years [33]. Moreover, a study conducted in Lebanon by Suzan et al., (2015) revealed that the mean age of 151 heart failure patients was 65 years [34]. The results of the present study could be explained in that people in Lebanon encounter many stressful situations along with hard living conditions, thus stresses might be the leading factor for having heart problems at lower ages.

Gender

The highest percentages of the HF patients in both groups were males. Such readings are supported by several studies, one of them mentioned that the incidence and prevalence of heart failure is lower in women than in men at all ages [35]. In addition, a study conducted in Lebanon about heart failure patients showed that the majority of patients were males [34].

Marital status

The highest percentages of patients in both groups were married. This could be related to the fact that patients aged between 50 and 60 years most probably be married and rarely to find people in this age not married. In addition that, married people face more social and psychological problems, that put burden and stresses on the individual. This is contradictory to a study which concluded that being married was associated with lower risk factors and better cardiac health status, even in the presence of many confounding effects. [36]. Another opinion by a study conducted in Lebanon which pointed out that adults with lower income and educational levels had a higher prevalence of heart disease independent of the risk factors of heart diseases; which included marital status.

Level of education

The higher percentages of the patients in both groups were uneducated. This might be related to the fact that people admitted to Makassed General Hospital mainly are coming from low socio-economical levels and thus, most of them were unemployed and uneducated. The present result was supported by a cohort study which revealed a positive relation between the low levels of education with cardiac dysfunction and predicted future hospital admission for chronic heart failure patients [37].

Occupation

The higher percentages of the patients in both groups were not working, as they might be either unemployed or retired. Also it could be interpreted in that, being physically inactive as in case of sedentary life approach or

in case of non- working will increase the risk of having heart problems. The findings also revealed that, most of those who were working were hard physical workers. This could be a reason to increase heart workload which might consequently lead to heart disease. The results of the present study matches the results of another study which mentioned that, as jobs become less physically demanding, risk of having heart disease or stroke decreased by 20% for each one unit drop in the ranking of physical intensity. Furthermore, it was indicated that, men with physically demanding jobs were more than four times as likely to develop heart disease as those with less-active jobs, if they also exercised regularly (American College of Cardiology, 2013).

Onset of manifestations of HF

The higher percentages of the patients admitted to the hospital after either 4 days or 1 day of having HF manifestations. This might be interpreted by the reality that people in Arab countries do not seek medical care unless having manifestations that are not relieved for several days. The result is also congruent with the study of Suzan et al., (2015), which showed that the majority of HF patients presented to the hospitals after having symptoms between 5 days to 1 week duration [34].

Duration of heart failure

The majority of the patients in both groups were those of 6 months < 1 year duration of heart failure. This is could be justified by that, patients with advanced stage of HF were excluded from the study. In addition, patients who have severe symptoms would seek medical care due to the physical disability related to their symptoms. This is consistent with a study which verified that, most of the HF patients usually diagnosed within months of having the disorder secondary to unrelated cause of admission as respiratory tract disease, infectious diseases and many other.

Class of heart failure

Most of the patients in both groups were of heart failure class II. That is related to that HF class I and IV were excluded from the present study, thereby, the higher percentage of the patients were from class II and the rest were from class III. This is congruent with the "National Heart, Lung and Blood Institute which reported that the higher percentage (35%) of patients with heart failure is in functional NYHA Class I and Class II, whereas the lowest percentage (5%) is in class IV.

Total percentage of knowledge about HF

The total percentage of correct answers in intervention group increased gradually from before giving educational to 1 month after discharge and then to higher percentages 3 months after discharge, whereas, the total percentage of correct answers in control group increased slightly from before receiving hospital care to 1 month after discharge, and then decreased 3 months after discharge. Thus, as mentioned previously, this again reassured the effectiveness of the educational sessions conducted. Such results is supported by a study conducted by Huey-Ling L et al. (2015) in which, both the intervention and control groups displayed a significant increase in their knowledge levels regarding HF [38]. However, this increase was higher in the intervention group. Furthermore, another study evaluated the effects of patient education on HF knowledge with the intervention group reporting a statistically significant increase in knowledge scores at discharge and one year compared to the control group (Gwardry-Sridhar et al.,). Such result favour the result of the present study, where mean score of intervention group was obviously much higher than mean score in control group in knowledge after precise and detailed educational intervention offered along with, reinforcement session before discharge along with booklet distribution.

Nurses play a substantive role in this endeavour, because they are the health care provider who most often provide support and teach self-care and symptom recognition and management to HF patients [39]. They can offer discharge instruction and ongoing education that result in better patient self-care (Gottlieb et al., 2009) [5]. Prevention of even a small number of readmissions to hospital could yield enormous saving in terms of hospital resources and social cost and helping patients to live with optimal quality of life [27]. In addition, much of HF management entails lifestyle changes in the areas of diet, weight monitoring and medication compliance.

Total percentage of self-care behavior

The total percentage of patients in intervention group who were practicing the self-care behavior was less than half in comparison to that of patients in control group which was more than half, before receiving education. However, there was significant increase in total percentage in adherence to self-care behavior 1 month after discharge, and continued to increase 3 months after discharge. There was also increase in total percentage of self-care behavior in 1 month after discharge, and continued to slightly increase 3 months after discharge. This is supported by a study carried on by Huey L et al., [38]. Showed an increased level of knowledge improved self-care behavior results when compared with results obtained from patients who underwent routine hospital

care only. Also another study by Parvin M. S, showed that the level of knowledge and self-care behavior was poor before educational intervention and there was no significant difference between two groups. While the mean scores in control group and intervention group were significantly different after the intervention. The comparison of changes in the intervention group was significantly more than the control group that represents the positive effect education [39].

A study of heart failure patients at Columbia San Jose Medical Center found that those who participated in an education program about self-care and medication compliance were nearly half as likely to be readmitted to the hospital as nonparticipants. Patient education can also help reduce hospital readmissions. An article in the Journal of the American Medical Association found that at least 20 percent of hospital patients in the United States return within 30 days of discharge (Hernandez et al.,). A study funded by the Agency for Healthcare Research and Quality (AHRQ) published in the Annals of Internal Medicine found that patients who are given clear after-hospital care instructions, such as how to take the proper medications and when they should schedule follow-up visits, are 30 percent less likely to go to an emergency department or be readmitted to a hospital than patients not given this information [40].

Quality of life

Heart failure causes multiple physical symptoms which lead to activity intolerance in the patients as well as, affects negatively their QOL. Some studies have presented that 76.4% of patients with HF had relatively poor QOL and HF has a negative effect on QOL. The mean score of QoL of patients in intervention group was lower than that of patients in control group before receiving education. The mean score then declined for patients in intervention group while increased for patients in control group

1 month after discharge. Similarly, the mean score continued to significantly decline for patients in intervention group while increased for patients in control group 3 months after discharge. This could be asserted that lower mean scores in intervention group reflects better quality of life than those in control group, even that maintained three months after discharge. This result could be support by five studies evaluated the effects of patient-centered self-care education on QoL. One of the studies used personalized feedback encompassing life circumstances, lifestyle knowledge, and medical therapy to demonstrate a statistically significant improvement in QoL at 12 months follow-up.

Three studies using individualized patient-centered self-care education reported a positive trend toward

improvement in QoL [19]. Furthermore, an intensive, systematic, tailored, and planned education and support has been shown to be effective in improving self-care behavior and quality of life in patients with HF. Individualized advice related to HF education may enhance self-care education and may improve quality of life [41,42].

The current findings of the study is consistent with the findings of van der Wal, Jaarsma and Moser and Evangelista who found that the knowledge is major factor to improve HF patients' quality of life [19,43]. This is can be one important factor for the positive effect of the intervention, the patients were active in their self-care in order to prevent and at an early stage to detect any deteriorated in their health and lead them seeking for medical help [44]. A growing number of intervention studies have aimed to boost patients knowledge and self-care abilities, reduce re-admission and mortality and improve quality of life [44]. Our findings are consistent with these studies. The findings of this study provides further evidence that knowledge, self-care behavior and QoL were significantly better in the intervention group after 1 month and after 3 months after discharge compared to the control group. Similar study in the Netherlands showed that after one month of education for patients with heart failure, self-care behavior had increased significantly in the control group and the intervention group but improving self-care behavior and survival rate in intervention group was higher than the control group so it should be considered that the main goal in education is creating healthy behavior which are proper and constant. This continuity of care is valuable for patients. It seems that if the self-care activities are accompanied with active teaching methods, they can play an effective role toward promoting optimal healthy behavior and thus improving QoL. Therefore, it is possible for patients to provide the best possible condition with minimal effects on their lives.

Correlation between knowledge, self-care behavior, and quality of life

The findings of the presented study showed that there is a significant positive correlation between knowledge and self-care behavior in intervention and control group, with a better total mean scores for patients in intervention group. This means that, patients were used to apply the knowledge received in the educational sessions, and this is of utmost importance as what really matters in the knowledge perceived is the behavior applied. This would be upheld by Tawalbeh [45,46], who found a statistical significance improvement among patients in intervention and control group, before and after giving education [47].

He reported that, applying cardiac education program helps improve knowledge and self-care among patients with heart failure and that such educational program should be adopted in clinical settings to enhance knowledge and self-care behavior. Contrariwise, Naweed et al. [48], mentioned that general information of certain CVD risk factors may not be enough to create change in self-care behavior because of several intermediate recognition points that are required, including perception of severity, perception of benefits, calls to action, and self-efficacy [49]. He added that, additional factors affecting the ability to change behavior include personality, values, ethnicity, socioeconomic status, family responsibilities, quality of life, cognitive function, and other comorbidities.

On the other hand, findings in the present study revealed that quality of life was not found to be correlated with knowledge and self-care behavior in intervention and control group. This might be related to the fact that, quality of life is matter of bio-psycho-social aspects of life, thus in order to have a change showed up. Moreover, this might also be due to a wide range of definitions of the quality-of-life-related, and assessing data related to QoL is therefore a way confusing. A consistent study conducted by Markku (2015), found that quality-of-life-related parameters, such as functional capacity, exercise performance, psychological status, and frequency of re-hospitalizations, are more significant and the effects of therapies and interventions on these parameters are, however, underrepresented in clinical trials targeted to assess heart failure treatment efficacy, and data are overall scarce. Markku added that, this is possibly due to a non-universal definition of the quality-of-life-related endpoints, and to the difficult standardization of the data collection.

Correlation between health profiles and knowledge, self-care behavior, and quality of life of patients in both groups

The present study showed a negative significant correlation between knowledge and age group in intervention group. Thus, as age increases knowledge about the disease decreases. This could be justifiable since the aging process might decrease ability to acquire new skills, deteriorates cognitive capabilities and weakens ability to perceive information. Certain studies suggested that to each age group of patients there must be a tailored approach in the way of teaching [50].

The present study also showed a negative significant correlation between Education and Knowledge in both, intervention and control group. A good educational level in certain field of work or specialty is not necessarily

means to have a good knowledge in other areas or specialties. Hence, educated patients had participated in this study, yet they had very weak knowledge pertaining their disease, because either they are not following on their health status as must, rather busy in their regular daily duties, or no enough educational support is being offered by their health care providers. However, this was not consistent with a study conducted by Cheryl (2011), which found a positive significant correlation between Education and Knowledge among HF patients. Furthermore, a negative significant correlation was found between Class of HF and quality of life [51]. Thus, the more advanced stage of HF is, the worse the quality of life would be. The decreased bodily functional ability to perform activity of daily living attributed to the advanced stage of HF justifies the above mentioned results. Moreover, the more advanced stage of HF is the more hospitalization is required. Intravenous medications to support the heart functions, and respiratory support as well. Thus, the prolonged length of stay in the hospital along with its potential complications, as pressure ulcer, falls down, and nosocomial infection, is a key contributor to the regression in QoL. This was similar to a study by Juliana (2013), which found that there is a negative correlation was found between Class of HF and quality of life [52].

In addition, there was a positive correlation between age group and quality of life of patients in control group. It well known that mostly older patients are not exposed to activity of daily livings and jammed in doing activities as equally as young patients. Thus, at lower ages quality of life is more sensitive and affected in a huge way in comparison to quality of life at older ages. This was upheld by Saheed (2017), in which he found a positive correlation between age group and quality of life among heart failure patients [53]. Against this, was a study by Gott (2006), who reported that no correlation found between age group and quality of life [54].

Eventually, the educational strategies for patients with HF had resulted in improving outcomes in terms of self-care behavior and QoL. Several studies demonstrated that patient-centered self-care education, when used as part of a comprehensive disease management strategy, may have a positive benefit in reducing readmissions and improving HF knowledge, self-care, and QoL [55].

The studies included in certain review suggested that reinforcement of patient-centered self-care education may also increase the likelihood of achieving positive outcomes [56]. The stress and anxiety that comes with a diagnosis of HF could impair a patient's ability to assimilate information making repeated reinforcement

necessary for good outcomes. Positive reinforcement increases the likelihood that a desired behavior will occur.

Reinforcement was also used to ensure that the effect of the education did not dissipate over time. This is consistent with other literature that demonstrates the significance of reinforcement on knowledge and self-care behavior (Yves et al., 2014). Hence, the studies mentioned support results of our present study, which also included reinforcement session before discharge and the provision of educational material to be kept as reference get back to whenever needed. Although nursing perceives patient teaching as an essential function, there is significant disparity between policy and practice. The evidence cited shows that nurses are not doing effective, consistent patient teaching and are not perceived by patients and doctors as competent in patient teaching. It appears that nurses do not view patient teaching as a priority and that nurses are not held accountable for patient teaching. Patient teaching seems to be done only "if there is time." It is often done on an informal and largely voluntary basis by motivated nurses. Nurses must awaken to the fact that patient education is not a luxury, but a necessity if patients are to receive maximum benefit from today's knowledge of treatment, prevention, and control of disease. Multiple factors interfere with nurse's doing adequate patient teaching, including inadequate preparation to teach and discrepancies in acceptance of teaching as the nurse's role. These obstacles can be overcome; they must be overcome if nursing is to make a significant contribution toward quality health care [57].

Based on the findings of this study, results had showed a significant effect of educational intervention on knowledge, self-care behavior, and quality of life among chronic heart failure patients and it was an effective teaching approach since as several studies highlighted above, time to deliver the education was considered, a reinforcement session was offered prior to discharge, an educative booklet is kept with the patient to have as reference getting back to as needed, and a close follow up is conducted at 1 month, and 3 months after discharge. All these factors were a key contributor to a successive and effective patient education.

Conclusion

Supporting people with HF in their efforts to manage illness requires an understanding of behavioural change and appropriate strategies [2]. By using a patient-centered approach that fosters collaboration and empowers the patient to be involved in his or her care, nurses can help ensure that the person with HF makes informed decisions about self-care and assumes

responsibility for choices to modify his or her lifestyle behaviours and hence will be improving their QoL. Patients who are involved in their care are also more confident in their ability to manage their condition (AHA, 2009). Furthermore, challenges are clearly on how to help patients take care of themselves with coordinated support from professionals, particularly nurses, who comprise largest body of healthcare professionals worldwide. Heart failure patients need education in order to adapt to their chronic condition and perform self-care behaviours.

Recommendations

The recommendations of the current study can be classified as recommendations related to administrative or research recommendations.

Administrative recommendation

Developing tools of education to help nurses provide patient-centered education thoroughly using inter professional approach. Providing in service training to the nurses to be fully aware of the utmost importance of teaching patients thoroughly during hospitalization and before discharge, notably those with chronic diseases that threaten their quality of life

Research-related recommendations

Further studies are recommended to be conducted in the future including: Assessing the impact of similar educational intervention on patients' quality of life over long period of time. Assessing the psychological well-being of chronic heart failure patients as depression, and how it could impact their QoL. Studying the same program on a larger sample size selected from more than one hospital. Studying the same program with modification in the implementation for literacy patients, this is will be crucial for meeting the health care needs of the illiterate HF patients in Lebanon.

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