Impact of Nursing Education Program on Physical and Emotional Domains by Minnesota Living on Patients with Heart Failure in Sulaimani City

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Abstract

Background: Health-related quality of life is often diminished in people with coronary artery disease, particularly after experiencing acute coronary syndrome. Heart failure is a prevalent issue in this group, which greatly impacts their quality of life. The main objective to assess the impact of nursing educational program on physical and emotional domain on heart failure patients in a Cardiac Hospital.

Materials and Methods: A quasi-experimental design enrolled 200 patients with heart failure at the Cardiac Hospital in Sulaimani City, Iraq. Two groups divided into interventional (n=100) and control (n=100), contributors finalized a full questionnaire covering socio-demographics, level of stress and knowledge about heart failure. Data by face to face interviews, and analysis done by SPSS 26.0 version.

Results: The mean age of both groups was 68.3±11.2 years. 72% and 69% of both groups were male respectively. Each group initially had 100 patients. 59%, 65% of them were illiterate, 52%, 50% was widow/er, 48%, 50% of both intervention and control groups were married respectively. However, after the program, the intervention group's score dropped to (37.06±8.26), while the control group's increased to (50.10±10.62), showing a very highly significant difference with p≤0.001. Similarly, after the program the intervention group's score decreased to (9.97±2.32), while the control group's rose to (15.96±2.31), also showing a very highly significant difference with p≤0.001.

Conclusion: The implementation of the nursing educational program demonstrated highly significant improvements in the physical and emotional domains among participants in the intervention group when compared to those in the control group.

Keywords: nursing educational program, physical, emotional, Minnesota Living with Heart Failure, heart failure, Sulaimani city

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Introduction

Cardiovascular disease (CVD) remains a primary cause of mortality in developed nations [1]. Heart failure (HF), the most rapidly increasing form of CVD globally, exerts a substantial worldwide burden, impacting approximately 26 million individuals [2]. The HF is a chronic and progressively debilitating condition, with symptom severity escalating as the disease advances. This progression leads to a pronounced decline in both physical and social well-being and is associated with higher rates of hospitalization [3]. Economic evaluation provides critical evidence to guide comparative decision-making, particularly regarding cost-effectiveness [4]. The World Health Organization (WHO) defines quality of life (QoL) as an individual's perception of their position in life, influenced by their cultural and value systems, in relation to their goals, expectations, concerns, and standards. In clinical practice, heart failure-related quality of life (HRQoL) is defined by how individuals perceive the impact of their illness on daily living. More specifically, HRQoL assesses how patients view their experience of living with the disease, considering factors such as functional ability, work health, overall health perception, and psychosocial functioning within their specific context [5]. The Minnesota Living with Heart Failure Questionnaire (MLHFQ) is a widely utilized tool in clinical research to assess the quality of life in heart failure patients. In such studies, the statistical significance of the change in MLHFQ scores before and after an intervention is commonly used as a key criterion for evaluation [6]. The

minimal clinically important difference (MCID) serves as a vital benchmark for assessing the intervention's effectiveness from both the clinician's and patient's perspectives, offering a clear indication of whether the treatment is beneficial. In essence, if the score change meets or exceeds the MCID, the intervention is deemed effective [7]. The current study aimed to assess the impact of nursing educational program on physical and emotional domain on heart failure patients in Sulaimani Cardiac Hospital.

Material and Methods

Study Design

A quantitative design, quasi-experimental study, was employed to evaluate the impact of a nursing educational program on the physical and emotional domains of heart failure patients at Sulaimani Cardiac Hospital. The study was conducted over a period extending from August 2, 2021, to February 8, 2024.

Study Setting

This study was conducted at Sulaimani Cardiac Hospital in Sulaimani city, which is a major city in the Kurdistan Region of Iraq, located in the northeast of the country. Established in 1784 by Ibrahim Pasha Baban, Sulaimani serves as a center of Kurdish heritage and modern education, hosting universities, museums, and cultural institutions. The city lies in a mountainous region. Sulaimani Cardiac Hospital is the primary facility for treating heart disease in the region. Located within Sulaimani City in the Iraqi Kurdistan region, the hospital has been a central institution for cardiovascular care since its establishment in 2005. The coronary care unit comprises 33 beds, including two specifically designated for immediate emergency evaluations prior to admission. The unit is staffed by 73 nurses, 53 of whom are graduates of the Institute of Nursing, and 20 are graduates of the College of Nursing.

Study Sample

A non-probability purposive sampling method was employed to select participants for this study. Heart failure (HF) patients admitted to Sulaimani Cardiac Hospital, diagnosed by cardiologists, were invited to participate. A total of 200 patients were retained for the study, with participants divided into two groups: 100 patients were assigned to the intervention group, while the remaining 100 formed the control group.

Inclusion and Exclusion Criteria

The study included adult participants over 18 years of age, diagnosed with heart failure with reduced ejection fraction (HFrEF), confirmed by a team of cardiologists at least three months prior to the study. Participants retained the right to refuse participation or withdraw at any time. Exclusion criteria included patients with severe mental health disorders, liver or kidney failure, and chronic lung diseases such as asthma and chronic obstructive pulmonary disease (COPD), due to the potential health complications these conditions could pose during the study period.

Study Instruments

The study tool was composed of two parts, that represent demographic data of patients with HF such as age, gender, marital status, educational level, residential area, economic state and the tool of Minnesota Living with Heart Failure Questionnaire (MLHFQ), which explained below:

The MLHFQ for QoL consists of 21 questions specific to heart failure. Questions are answered using a Likert scale of 0–5; 0 indicates that the question has no impact on the patient or is not applicable, and 5 indicates the greatest adverse effect.

This tool divided into three domains: the overall QoL domain (score range 0–105, which is the summation of 21 questions' scores), the physical domain consists of eight questions (2, 3, 4, 5, 6, 7, 12, and 13; score range 0– 40), and the emotional domain made up of five questions (17, 18, 19, 20, and 21; score range 0–25). A higher score represents a poorer QoL. The overall total score as the best measure as opposed to the other two domains which were created following factor analysis [8].

The MLWHFQ is designed to assess the effects of HF symptoms, functional limitations, and psychological distress on the HF patient's quality of life [9]. The best cut-off value for MLHFQ scores is to identify those patients with good, moderate, or poor QoL [10, 11] estimated a score of < 24 on the MLHFQ represents a good QoL, a score between 24 and 45 represents a moderate QoL and a score > 45 represents a poor QoL.

Validity of the study

The validity of data collection was confirmed through a rigorous review by a panel of eight experts. They critically assessed the study questionnaire and offered feedback, which prompted revisions to improve the relevance and clarity of the instrument, thereby strengthening its overall validity.

Pilot Study

The study was conducted with 20 heart HF patients from the initial sample between January 15th, 2022, after which they were excluded from the final study population.

Reliability of the study sample

Reliability was assessed using the Cronbach's Alpha correlation coefficient and the stability approach (test-retest method), yielding a robust correlation (r = 0.85).

Approaches of data collection

All patients diagnosed with heart failure (HF) and admitted to the Cardiac Hospital in Sulaimani City were included in the study sample. Data were gathered through face-to-face interviews, where patients provided their personal information. The data collection process began on March 26th, 2022, and completing the HF-related questionnaire required approximately 10 minutes.

Statistical Analysis of the study sample

Version 26 of the Statistical Package for the Social Sciences (SPSS) was employed to code and organize the data into digital files. Inferential data analysis was performed, along with frequency and percentage calculations, and statistical tests such as the chi-square and independent t-test were applied to process the data.

Ethical Approval and Statements

The study protocol was approved by the College of Nursing at the University of Sulaimani (No. 176 on Sep 19, 2021-UoS). An official agreement letter from the College of Nursing was sent to the Directorate of Health at Sulaimani Cardiac Hospital, requesting facilitation and cooperation in the implementation of the nursing educational program.

Results

Total number of HF patients was 200, their mean age (±SD) was 68.3 ± 11.2 years and the age range were between 38 – 100 years. No significant differences were detected in the age distribution or the mean age of the two study groups (p = 0.23 and 0.11 respectively). More than half of the intervention and control group (72%, 69%), respectively, were males. Half of intervention and control group (52%, 50%), respectively were widower, and they live alone or with their children as shown in **Table – 1.**

Table-1 Distribution of socio-demographic variables and clinical characteristics of participants

Variables	Classes	Interventional group F (%) n = 100	Control group F (%) n = 100	Total N = 200	p- value
Age (in years)	38 - 50	10	3	13	
	51 - 64	26	20	46	
	65 - 80	52	65	117	0.110*
	81 - 100	12	12	24	
	Mean ± SD	67.3 ± 11.5	69.2 ± 10.8	68.3 ± 11.2	0.232 **
Gender	Male	72	69	141	0.645 *
	Female	28	31	59	
Educational Status	Illiterate	59	65	124	0.626 *
	Primary & Secondary School	34	31	65	
	Institute & College	7	4	11	
Marital status	Married	48	50	98	0.785 *
	widower	52	50	102	
Profession	Non- governmental employee	71	73	144	0.787 *
	Governmental employee	7	7	14	
	Retired	22	20	42	
Residency	Inside the city	95	87	182	0.048 *
	Outside the city	5	13	18	
Financial condition	Bad economic	63	68	131	0.463 *
	Medium economic	29	28	57	
	Good economic	8	4	12	

While others were married and live with their wives or their husbands. The proportion of illiterate patients was higher in the control group than the intervention group (65% and 59%), respectively, while the proportion of secondary school and college graduates was higher in the intervention than the control group (14, 7%). In control group housewife was slightly more than interventional group (25%, 29%). Almost all of the patients of the intervention group (95%) were living in urban areas compared to (87%) of patients of the control group. More than half of both group's incomes were less than expenditures (63%, 68%) as shown in **Table – 1.**

Table-2 Comparisons between both groups related to Minnesota Living with Heart Failure Questionnaire (MLHFQ) before and after the nursing educational program

Variables	Interventional group Mean ± SD	Control group Mean ± SD	p-value*
Physical (0-40)			
Pre-test	45.4±13.67	47.3±12.77	0.311
Post-test	37.06±8.26	50.10±10.62	0.001
Emotional (0-25)			
Pre-test	13.73±3.21	14.62±3.31	0.073
Post-test	9.97±2.32	15.96±2.31	0.001
Total (0-105)			
Pre-test	73.92±19.43	77.42±19.00	0.199
Post-test	56.84±11.92	78.84±30.39	0.001

*independent Samples t-test

The mean physical dimension score before the educational program was 45.4±13.67 in the intervention group and 47.3±12.77 in the control group, with no significant difference. However, after the educational program, the mean physical dimension score in the intervention group was 37.06±8.26, while it was 50.10±10.62 in the control group, indicating a significant difference with $p \le 0.001$.

The mean emotional dimension score before the educational program was 13.73±3.21 in the intervention group and 14.62±3.31 in the control group, with no significant difference. However, after the educational program, the mean emotional dimension score in the intervention group was 9.97±2.32, while it was 15.96±2.31 in the control group, indicating a significant difference with $p \le 0.001$.

The overall mean score of the (MLHFQ) before the educational program was 73.92±19.43 in the intervention group and 77.42±19.00 in the control group, with no significant difference. However, after the educational program, the mean MLHFQ score in the intervention group was 56.84±11.92, while it was 78.84±30.39 in the control group, indicating a significant difference with $p \le 0.001$ as shown in **Table-2.**

Discussion

In this study, a total of 200 patients diagnosed with heart failure (HF) were enrolled from a cardiac hospital. Among these, 100 patients who underwent a nursing educational program formed the intervention group, while the remaining 100 patients received standard hospital care, constituting the control group. The average age of the participants was 68.3±11.2 years, spanning an age range from 38 to 100 years. This finding is consistent with the research conducted by [12], which reported a mean age of 61.7±9.4 years for their cohort. In both the intervention and control groups of the present study, the majority of participants were male, paralleling the results reported by [12] in Iran and [13] in Greece, both of whom noted a predominance of male participants.

The results of the current study indicated that nearly half of the participants in both the intervention and control groups were married, aligning with findings from [13] in Greece, which reported that just over half of both groups were also married. Furthermore, more than half of the widowed patients in both groups lived alone, while less than a quarter cohabited with their children. The majority of participants in both groups were illiterate, which contrasts with the findings of Akbari et al. [14] who noted that high school graduation and elementary education were the most common educational levels among their participants. Additionally, over half of the individuals in both the intervention and control groups reported experiencing low economic status (with income falling below expenditures), consistent with the findings of Akbari et al. [14] in Tehran.

The economic status findings in this study closely align with those reported by Lakdizaji [12] in Iran, with over half of the participants in both studies indicating a low economic status. In terms of living arrangements, the results of our study are similar to those of [12], as nearly half of the participants in both studies resided with their spouses. The current study revealed that prior to the implementation of the nursing educational program, the average physical dimension score was 45.4±13.67 in the intervention group and 47.3±12.77 in the control group, indicating no significant difference between the two. However, following the program, the average physical dimension score in the intervention group decreased to 37.06±8.26, while the control group's score increased to 50.10±10.62, resulting in a significant difference (p=0.001). In terms of the emotional dimension, the average score before the program was 13.73±3.21 in the intervention group and 14.62±3.31 in the control group, with no significant difference observed. After the educational program, the average emotional dimension score in the intervention group dropped to 9.97±2.32, whereas in the control group, it rose to 15.96±2.31, revealing a significant difference with p=0.001 (p<0.01).

Regarding the overall score of the MLHFQ, prior to the educational program, the average score was 73.92±19.43 in the intervention group and 77.42±19.00 in the control group, showing no significant difference. However, after the educational program, the average MLHFQ score in the intervention group decreased to 56.84±11.92, while in the control group, it increased to 78.84 ± 30.39, resulting in a significant change (p=0.001). This finding is consistent with the research conducted by Howden et. al. [15], who reported that regular aerobic exercises enhanced left ventricular flexibility by 25% in 61 sedentary participants aged 45 to 64 from the Dallas Heart Study. The participants were divided into two groups: one engaged in non-aerobic exercises while the other participated in aerobic activities. After six months of aerobic exercise, the aerobic capacity of the exercise group improved by 18%, and left ventricular stiffness was reduced by 25%, whereas the non-aerobic exercise group showed no significant changes. This finding contrasts with the overall results reported by Seto et al. [16] in Canada, who indicated that the average score on the MLWHFQ was 49.9 ± 25.4. The improvements in the physical and emotional domains following the interventional program align with a 2019 study conducted by the University of Burgundy Franche-Comté, which found that participants in 25-session cardiac rehabilitation program experienced enhancements in both physical and emotional health within weeks. Notably, participants with severe physical limitations initially gained the most benefit from regular exercise, as noted by Deley et al. [17]

The present findings diverge in the physical and overall subscales when compared to the study conducted by [18], titled "Comparison of Health-Related QoL Between American and Taiwanese Heart Failure Patients." Their research reported mean and standard deviation scores of 17.7±10.8 and 23.6±10.9 for the physical subscale, and 43.8±25.1 and 52.6±22.7 for the overall subscale in Taiwanese and American patients, respectively. However, there is a strong correspondence in the emotional subscale, with scores nearly aligning at 11.4±7.4 for Taiwanese patients and 11.9±7.0 for American patients. Congestive heart failure, characterized by early fatigue and exercise intolerance, frequently results in functional loss, social isolation, depression, and anxiety, all of which can significantly impact QoL. Numerous studies, including those by [19, 20] have reported no significant changes following exercise training. In contrast, other research has demonstrated that exercise positively impacts QoL, yielding favorable outcomes, as seen in the studies conducted by [21–24]. The inconsistent application of QoL measurement tools across various studies, such as the Minnesota Living with Heart Failure (MLWHF) questionnaire and the Dyspnea-Fatigue Index, complicates the interpretation of data concerning anxiety and sadness.

A study by Koukouvou el.al. [25] reported a significant reduction in both anxiety and sadness following a six-month training program. Improvements in well-being, mood, and social interaction were associated with initial physical and psychological gains, although a ceiling effect was observed. Patients with higher levels of depression exhibited greater improvements following exercise training. However, the benefits attained were not sustained six months after the training was discontinued, highlighting the necessity for ongoing exercise to maintain QoL improvements, as noted by Willenheimer et al. [26].In patients with heart failure (HF),

the involvement of caregivers in decision-making varies according to the clinical context, with caregivers assuming different supportive roles based on the specific nature of the decisions being made. Decision-making in HF encompasses a wide range of choices, including selecting medication classes, dietary considerations, and daily physical activity. [27] The researchers noted that a preprogram did not effectively address the needs of HF patients due to physical challenges. Heart failure complicates daily activities due to issues such as breathing difficulties, fatigue, and limb swelling. It is classified into four categories based on the severity of symptoms, which significantly impacts QoL particularly in older adults. As heart failure progresses, symptoms tend to worsen, and the presence of comorbid health conditions makes recovery increasingly difficult. Furthermore, the lack of regular exercise in our country presents an additional challenge for older individuals managing HF.

Conclusion

From this study, the nursing educational program demonstrated a substantial positive impact on the quality of life of heart failure patients in the intervention group, significantly improving both physical and emotional dimensions compared to the control group. These findings highlight the critical role of targeted educational interventions in enhancing patient outcomes, particularly in resource-limited settings. The results underscore the necessity of integrating structured nursing education programs into standard care protocols for heart failure patients to address their comprehensive needs effectively and improve their overall well-being.

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Authors' Contributions

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