

Effect of interventional follow-up phone calls on health-related quality of life in adult patients with heart failure in Saudi Arabia: a pilot study

Wpływ interwencyjnych kontrolnych rozmów telefonicznych na jakość życia związaną ze stanem zdrowia dorosłych pacjentów z niewydolnością serca w Arabii Saudyjskiej: badanie pilotażowe

Dhuha Youssef Wazqar , Nojoud Usamah Abu Al-Saud

Medical-Surgical Nursing, King Abdulaziz University, Saudi Arabia

CORRESPONDING AUTHOR:

Dhuha Youssef Wazqar

Medical-Surgical Nursing, King Abdulaziz University, Jeddah, Saudi Arabia

e-mail: dwazqer@kau.edu.sa

tel. +96654455902

STRESZCZENIE

WPŁYW INTERWENCYJNYCH KONTROLNYCH ROZMÓW TELEFONICZNYCH NA JAKOŚĆ ŻYCIA ZWIĄZANĄ ZE STANEM ZDROWIA DOROSŁYCH PACJENTÓW Z NIEWYDOLNOŚCIĄ SERCA W ARABII SAUDYJSKIEJ: BADANIE PILOTAŻOWE

Cel pracy. Celem pracy było określenie wpływu interwencyjnych rozmów telefonicznych na jakość życia związaną ze zdrowiem u dorosłych pacjentów z niewydolnością serca.

Materiał i metody. Ten quasi-eksperymentalny projekt metodą pre-test i post-test przeprowadzony został na 30 pacjentach z niewydolnością serca otrzymujących interwencyjne rozmowy telefoniczne od pielęgniarek kardiologicznych z uznanej na całym świecie organizacji opieki zdrowotnej w Arabii Saudyjskiej. Dane zostały zebrane w ramach badań socjodemograficznych i klinicznych oraz kwestionariusza Minnesota Living with Heart Failure. Przeprowadzono sparowany test t-studenta w celu zmierzenia skuteczności dalszych połączeń na jakość życia w fazie wstępnej i po badaniu.

Wyniki. Stwierdzono statystycznie istotną różnicę między średnimi wynikami sprzed interwencji i po interwencji dotyczącą całkowitej jakości życia związanej ze zdrowiem a wszystkimi podskalami: fizycznymi, emocjonalnymi/psychologicznymi i społeczno-ekonomicznymi ($p < 0,001$). Różnica między średnimi wynikami przed testem wyniosła 31,08 (SD = 1,09), co było statystycznie istotne przy $t(29) = 14,29$ ($p < 0,001$). Ogólna jakość życia uczestników związana ze zdrowiem znacznie wzrosła po interwencji (M = 39,04, SD = 1,66).

Wnioski. Stwierdzono, że interwencyjne rozmowy telefoniczne są skuteczne w poprawie jakości życia pacjentów z niewydolnością serca. Potrzebne jest jednak większe badanie, wieloośrodkowe, w celu potwierdzenia wyników tego badania. Dostarczając dowody empiryczne, badania te mogą motywować pielęgniarki kardiologiczne do kontynuowania takich programów w tej populacji.

Słowa kluczowe:

rozmowy telefoniczne, pacjenci z niewydolnością serca, jakość życia związana ze zdrowiem, pielęgniarki, badanie quasi-eksperymentalne

ABSTRACT

EFFECT OF INTERVENTIONAL FOLLOW-UP PHONE CALLS ON HEALTH-RELATED QUALITY OF LIFE IN ADULT PATIENTS WITH HEART FAILURE IN SAUDI ARABIA: A PILOT STUDY

Aim. To determine the effects of interventional follow-up phone calls on the health-related quality of life (HRQOL) in adult patients with heart failure (HF).

Material and methods. This quasi-experimental with a one-group pretest-posttest design was conducted on 30 patients with HF receiving interventional follow-up phone calls by a cardiology nurse from an internationally recognized healthcare organization in Saudi Arabia. Data were collected by sociodemographic and clinical surveys and Minnesota Living with Heart Failure Questionnaire. A paired sample t-student test was conducted to measure the effectiveness of the follow-up calls on the HRQOL pretest and posttest.

Results. A statistically significant difference was found between the pre-intervention and post-intervention mean scores of the total HRQOL scale and all the subscales: physical, emotional/psychological, and socio-economic ($p < 0.001$). The difference between the mean pretest-posttest scores was 31.08 (SD=11.09), which was statistically significant at $t(29)=14.29$ ($p < 0.001$). The participants' overall HRQOL increased significantly after the intervention (Mean=39.04, SD=1.66).

Conclusions. Interventional follow-up phone calls were found to be effective in improving the HRQOL of patients with HF. However, a larger study – a multi-center one, is needed to confirm the findings of this study. By providing empirical evidence, this research may motivate cardiology nurses to pursue such programs in this population.

Key words:

follow-up phone calls, health-related quality of life, nurses, patients with heart failure, study quasi-experimental

INTRODUCTION

Heart failure (HF) is a major global health problem in terms of mortality, morbidity, prevalence, and burden on healthcare systems [1]. The prevalence of HF is growing in developed nations due to the effectiveness of secondary prevention, the aging of global population, and long-term survival of patients [2]. An estimated 26 million HF cases exist worldwide, with the annual incidence expected to surpass 8 million by 2030 [1]. In Saudi Arabia (SA), the estimated incidence of HF is 32,200 cases and the extrapolated prevalence is 455,222 cases annually [3]. A study by Albacker et al. revealed that 20% of people with acute coronary syndrome admitted to Saudi hospitals had HF [4]. Additionally, the rate of deaths due to HF is high in Arab countries, including SA (42%), the UAE (38%), Bahrain (32%), and Qatar (23%) [5]. The international financial strain of HF is expected at US\$108 billion per year, comprising US\$43 billion in indirect costs and US\$65 billion in direct costs [6].

Frequent hospitalization and symptoms negatively impact the physical, emotional, and social quality of life of HF patients and significantly reduce their life expectancy [7]. Fifty percent of hospital readmissions of patients with HF can be prevented through better medication compliance, good nutrition, daily weighing, and closer follow-up of symptoms by specialists and more discerning self-observation [8]. Therefore, implementing disease management programs and continuity of post-discharge education for patients with HF may significantly improve their health-related quality of life (HRQOL) and reduce hospital readmissions and medical costs [9,10]. The HRQOL of patients with HF is a significant outcome used to evaluate the efficiency of treatment and the impact of HF on patients' daily lives and wellbeing, and it is regarded as an important element in the design of intervention programs [11]. Remote monitoring or follow-up phone calls programs are useful in actively engaging patients with chronic diseases to improve their health and increase self-care behaviors [9, 10]. In addition, research has indicated that interventional phone calls positively affect patients' emotional status by emphasizing aspects that support daily routines and activities such as exercise and symptom management [9]. Telephone and other communication technologies are also simple, inexpensive, and effective alternative modes of care that allow patients with HF to receive services such as counseling, therapeutic, and educational interventions, thereby avoiding disease-related complications and deterioration [9, 12].

In SA, many descriptive, observational studies have examined the impact of HF on the HRQOL and educational needs of patients, but insufficient studies have investigated planned disease management or nurse-led intervention programs. Few international studies have also tested disease management using such a telephone follow-up intervention in relation to increased HRQOL and reduced readmissions in patients with HF [9,10,13]. Furthermore, the core purposes of effective HF management, recognized and published in the European Society of Cardiology recommendations, emphasize that the most essential goal

is disease management education (diet, weight control, medications, exercise, and actions to take in the events that symptoms worsen) of patients and their caregivers to ensure adherence to the treatment plan [14].

AIM

This study determined the effectiveness of interventional follow-up phone calls in improving the HRQOL of adult patients with HF in Jeddah City, SA. We hypothesized that patients with HF receiving interventional follow-up phone calls by a qualified cardiology nurse after discharge would report better HRQOL.

MATERIALS AND METHODS

Permission was obtained from the Institutional Review Board (IRB) committees of the university with which the investigators are affiliated and of the selected hospital (reference no. RC-J/446/39; dated December 21, 2019).

Study Design and Sample

The study used a quasi-experimental with a one-group pretest-posttest design. It was carried out on 30 adult patients with HF who were admitted to the Cardiovascular Telemetry Unit (CVT), and followed up in the cardiology clinics of an internationally recognized tertiary healthcare organization in Jeddah City in western SA. The eligibility criteria were being aged ≥ 18 years, having had HF for at least six months, having no communication problems (e.g., hearing impairment), being followed up in the cardiology clinic at the selected hospital, and agreeing to participate in this study. Patients were excluded if they had life-threatening diseases (e.g., cancer) or severe psychiatric or neurological disorders, or were aged > 60 years, because they required mental tests for dementia. A total sample of 30 participants was estimated to be required using an alpha of 0.05, providing 95% power to detect an effect size of 0.35. This effect size was comparable to that obtained by Sethares and Elliott [15], who studied the effects of a telemedicine intervention on readmission rates and HRQOL of patients with HF to detect or identify potential effects.

Instruments

Data were gathered through a questionnaire filled out by the patients that included sociodemographic and clinical information and the Minnesota Living with Heart Failure Questionnaire (MLHFQ).

The MLHFQ is a 21-item self-report disease-specific questionnaire for people with HF. Developed to measure the impact of HF on HRQOL, it uses a 6-point Likert scale from 0 (none) to 5 (very much) [16]. The MLHFQ includes three different domains that reflect patients' HRQOL during the past 4 weeks: physical (8 items, ranging from 0–40), emotional/psychological (5 items, ranging from 0–25), and socio-economic (8 items, ranging from 0–40). The scale questions focus on physical symptoms and signs of HF, emotion, physical and social functions, treatment side effects, hospital stays, and healthcare costs [16]. To score the MLHFQ, all items are added to find the total

HRQOL score, ranging from 0 to 105. Higher scores reflect lower HRQOL. The scale can be completed in less than 10 minutes. The internal consistency of the MLHFQ Arabic version has been estimated at 0.92, with no inter-items correlation at a Cronbach's alpha value of > 0.80 [17]. Cronbach's alpha values for the MLHFQ in this study were excellent for the total score (0.90), the physical subscale (0.85), the psychological subscale (0.87), and the socio-economic subscale (0.64).

Data Collection Procedures

Phase 1. (pre-intervention): The sociodemographic and clinical survey and MLHFQ were administered to the patients in their private rooms in the CVT unit before discharge. After submitting the study survey to the primary researcher, patients received discharge verbal education, including essential written education materials on diet, medication adherence, physical activity, weight measurement, and importance of follow-up appointments by the assigned patient family nursing educator. To confirm patient comprehension, the educational materials were reviewed with patients using a teach back method.

Phase 2. (intervention): The interventional follow-up phone calls were led by a qualified cardiology nurse holding a bachelor degree in nursing from the CVT unit with 10 years' clinical experience in cardiology units, to reduce potential bias as a result of non-randomization. There was a detailed teaching program for the cardiology nurses who performed the interventional phone calls in the selected hospital. The interventional follow-up phone calls were performed after discharge weekly for five weeks. The patients were told that they would be contacted during weekdays between 9:00 am and 4:00 pm. During the informed consent process, participants were also given sufficient instructions on how to avoid receiving any other study-related interventions and the effect of that on the study outcome as well as the cardiology nurse reminded them about that during the phone calls. Questions for structural interventional follow-up phone calls generated by the American Heart Association [AHA] were used, including four core components: personal information, patient teaching, medication administration, and further action required after the follow-up phone calls [18]. A checklist (HF Telephone Follow-up Form) was also used by cardiology nurse and reviewed by the primary researcher to ensure content was delivered as planned through the phone calls. Participants received recommendations focusing on the importance of maintaining normal body weight, daily exercise and physical activity, avoiding increased food intake, changing dietary habits including avoiding salt, habits such as smoking and alcohol use, and when they should go to the emergency room. Close monitoring of their symptoms, control of edema, and strict consistency in their medication regimens were also stressed. All participants were encouraged to communicate during each phone call with the cardiology nurse if they had any concerns or questions. Also, the cardiology nurse provided frequent comments on the patient's effort to control weight, edema, adherence to their medication regimens, and progress in each call and reviewed this

systematically with each patient. Each interventional follow-up phone call was between 15 and 30 minutes depending on the type of HF, severity of symptoms, and patient's needs.

The qualified cardiology nurse from the CVT, providing the interventional follow-up phone calls, convened with the primary investigator on weekly basis to discuss the participants' conditions, engagement, questions, or concerns, duration of each phone call, and ensure adherence to the intervention protocol. During these meetings, researcher blinding was sustained by removing all mention of identifying data and referring to participants by their research ID numbers.

■ Tab. 1. Participants' Sociodemographic and Clinical Characteristics (n=30)

Characteristics	No. (%)
Age (Year)	
Mean	52.54 (10.44)
Range	21-60
Gender	
Male	12(40)
Female	18(60)
Marital status	
Married	21(70)
Single	4(13.3)
Divorced	3(10)
Widowed	2(6.7)
Level of education	
Illiterate	7(23.3)
High school	12(40)
Diploma	2(6.7)
University/college	9(30)
Occupation	
Employee	5(16.7)
House wife	11(36.7)
Retired	9(30)
Student	1(3.3)
Own business	4(13.3)
Smoking status	
Yes	12(40)
No	7(23.3)
Ex-smokers	11(36.7)
Type of HF	
HFpEF	11(36.7)
HFrEF	19(63.3)
Reason for developing HF	
Ischemic Heart Disease	15(50)
Acute Coronary Syndrome	7(23.3)
Valve problems	5(16.7)
Kidney diseases	3(10)
Medical intervention received in the last 4 weeks	
None	17(56.7)
Implanted cardioverter-defibrillator implant	8(26.7)
Home healthcare	1(3.3)
Emergency medical service	1(3.3)
Cardiac catheterization	2(6.7)
Valve surgery	1(3.3)

Note: HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction

Phase 3. (post-intervention): The follow-up appointment date of each participant was recorded by the primary researcher on a tracking sheet. Generally, patients with HF after discharge from the CVT unit come to the cardiology clinic after a month or 6 weeks (based on their condition). The MLHFQ was re-administered to participants after finishing their appointments in an assigned room beside the cardiology clinics.

Data Analysis

Statistical analysis was performed by using the Statistical Package for Social Sciences version 25.0 for Windows (Armonk, NY; IBM Corp.). Frequency distributions, means, and standard deviations (SD) were used to evaluate the descriptive statistics. The data were also assessed for normality using the Kolmogorov-Smirnov test. A paired sample t-student test was performed to examine the effect of the follow-up calls on HRQOL pretest and posttest respective items. Analysis of variance (ANOVA) and t-test analysis were also performed to compare the means of the HRQOL with sociodemographic and clinical characteristics. Spearman correlation coefficients for nominal and non-parametric data and Pearson correlation coefficients for normally distributed data were used to examine the relationships between sociodemographic and clinical items and HRQOL. The level of significance was set at $p < 0.05$ in the analyses. Since the primary investigator checked the participants' questionnaire responses before leaving the clinic room to ensure no questions were left unanswered, there are no missing data.

RESULTS

The mean age of the participants in this study was 52.54 (SD = 10.44) years and more than half were females (60%). Most participants (70%) were married and only 30% had a university or college education. Forty percent were smokers, and 63.3% had HF with reduced ejection fraction. The length of diagnosis ranged from six months to four years, with mean of 3.25 (SD = 2.99) years. Almost half of the participants had received medical interventions in the last four weeks before admission (Tab. 1).

A statistically significant difference was found between the pre-intervention and post-intervention mean scores of the total MLHFQ and the subscales: physical, emotional/psychological, and socio-economic ($p < 0.001$) ones. The mean (average of subscale scores) total MLHFQ score decreased after the interventional follow-up phone calls ($M = 39.04$, $SD = 1.66$), which indicates an improvement in HRQOL, as shown in Tab. 2. The difference between the mean pretest-posttest scores was 31.08 (SD = 11.09), which was statistically significant at $t(29) = 14.29$ ($p < 0.001$). Furthermore, a strong positive relationship existed between the total MLHFQ pretest and posttest scores ($r = 0.87$, $p = 0.001$), suggesting participants who had high MLHFQ scores on the pretest also had high scores on the MLHFQ posttest. With respect to sociodemographic and clinical characteristics, no statistical significant difference in mean total MLHFQ score before and after receiving the interventional follow-up phone calls was found.

■ Tab. 2. Minnesota Living with Heart Failure Questionnaire (MLHFQ) Scores before and after Interventional Follow-up (n = 30)

Question	Before Intervention Mean ± SD	After Intervention Mean ± SD	Significance
Physical domain	33.35 ± 3.88	19.27 ± 6.31	$p < 0.001$
1. Causing swelling in your ankles or legs?	3.85 ± 0.92	1.81 ± 1.33	$p < 0.001$
2. Making you sit or lie down to rest during the day?	4.04 ± 0.72	2.50 ± 0.99	$p < 0.001$
3. Making your walking about or climbing stairs difficult?	4.38 ± 0.90	2.65 ± 1.16	$p < 0.001$
4. Making your working around the house or yard difficult?	4.04 ± 1.15	2.38 ± 1.36	$p < 0.001$
5. Making your going places away from home difficult?	3.35 ± 1.32	2.19 ± 1.30	$p = 0.002$
6. Making your sleeping well at night difficult?	4.54 ± 0.58	2.42 ± 1.21	$p < 0.001$
7. Making your relating to or doing things with your friends difficult?	3.81 ± 0.98	2.08 ± 1.02	$p < 0.001$
8. Making you short of breath?	4.38 ± 0.70	2.54 ± 1.03	$p < 0.001$
9. Making you tired, fatigued, or low on energy?	4.23 ± 0.65	1.96 ± 1.22	$p < 0.001$
Socio-economic domain	20.27 ± 4.62	10.85 ± 4.02	$p < 0.001$
10. Making your working to earn a living difficult?	1.81 ± 2.04	1.04 ± 1.37	$p = 0.051$
11. Making your recreational pastimes, sports or hobbies difficult?	3.38 ± 1.81	2.23 ± 1.39	$p = 0.005$
12. Making your sexual activities difficult?	1.35 ± 1.67	0.85 ± 1.38	$p = 0.053$
13. Making you eat less of the foods you like?	3.54 ± 0.71	2.12 ± 1.07	$p < 0.001$
14. Making you stay in a hospital?	4.85 ± 0.37	2.50 ± 1.17	$p < 0.001$
15. Costing you money for medical care?	0.38 ± 0.98	0.12 ± 0.43	$p = 0.032$
16. Giving you side effects from treatments?	1.62 ± 1.60	0.73 ± 1.12	$p = 0.030$
Emotional domain	16.50 ± 3.33	8.92 ± 3.68	$p < 0.001$
17. Making you feel you are a burden to your family or friends?	3.58 ± 0.81	1.69 ± 0.74	$p < 0.001$
18. Making you feel a loss of self-control in your life?	3.27 ± 0.72	1.96 ± 0.92	$p < 0.001$
19. Making you worry?	4.15 ± 0.67	2.31 ± 0.93	$p < 0.001$
20. Making it difficult for you to concentrate or remember things?	2.73 ± 1.82	1.38 ± 1.27	$p = 0.002$
21. Making you feel depressed?	3.13 ± 1.15	1.63 ± 1.24	$p < 0.001$
Total (21 questions)	70.12 ± 9.22	39.04 ± 1.66	$p < 0.001$

Note: SD, standard deviation; Range, 0-105, higher scores reflect lower health-related quality of life

DISCUSSION

This study investigated the effect of interventional follow-up phone calls on the HRQOL of Saudi patients with HF. The results indicate that follow-up phone calls by a qualified cardiology nurse had large and significant impacts on the overall HRQOL of patients with HF, as evidenced by the total MLHFQ scores before and after receiving the interventional follow-up phone calls. Because the MLHFQ is one of disease-specific measures of self-perception of the effect of symptoms on the function of patients with HF, this result could reflect improved function and a reduction in symptoms among participants in this study. Previous studies indicate that a ≥ 5 -point change in the HRQOL score is considered clinically significant in individuals with HF [19]. An effectiveness or implementation science study using more outcome measures is recommended to develop generalizable knowledge that may help in evaluating and improving HRQOL in patients with HF and healthcare system outcomes.

In this study, follow-up phone calls were important in empowering the patients' HF control, managing common symptoms, and avoiding HF exacerbations. Similarly, in Greece, Stavrianopoulos found that a telephone post-intervention increased the HRQOL of patients with HF ($p < 0.001$) [9]. In a randomized controlled study of 72 Taiwanese patients with HF, Huang et al. also reported an improvement in HRQOL, self-care confidence, and depression scores after follow-up phone calls ($p < 0.05$) [20]. Additionally, a study conducted by Delaney et al. on the effectiveness of telemonitoring including follow-up phone calls and self-care education interventions found improved HRQOL ($p = 0.004$) and knowledge among patients with HF ($p = 0.013$), and reduced hospitalization in the 90 days following the interventions [21]. Therefore, this intervention might improve self-care behaviours for HF, in turn, improving the HRQOL of these patients. However, in one study, where HRQOL was assessed with the MLHFQ, no significant difference was detected in the groups' overall scores [15]. The reasons for this result may be the criteria of patient selection or the dose and length of the interventions being insufficient to influence HRQOL as assessed by the MLHFQ. A secondary data analysis study in the seven largest hospitals around the USA found that patients with HF who received comprehensive interventions had higher HRQOL scores than patients who received incomprehensive interventions [19]. We could not find any other studies that investigated the effect of follow-up phone calls on the HRQOL of patients with chronic diseases or HF in SA to compare and contrast with the results of the present study.

In this study, no differences were found in mean total HRQOL scores based on sociodemographic and clinical data. The relationships were inconsistent between the HRQOL and sociodemographic characteristics of patients with HF, especially gender, age, marital status, level of education, occupation, and smoking. While some studies show that being younger is associated with better HRQOL, others show the opposite or no relationship [9,22,23].


In a review of HRQOL studies conducted in SA, women with HF were found to have lower HRQOL compared to men, particularly in emotional and physical domains, while younger patients had significantly higher HRQOL scores in most studies [22,24,25]. AbuRuz et al. indicated that Saudi patients may choose not to express their feelings and emotions during sickness and avoid asking for social and emotional assistance from health care professionals, which consequently impacts their HRQOL [22].

The absence of a control group to compare, the use of a self-report questionnaire, the non-probability sampling technique, and the failure to take into account the HF knowledge of participants in planning the intervention were the study's limitations. To decrease performance bias, the patient-reported outcome was evaluated by the principal investigator, and the interventional follow-up phone calls were provided by a cardiac nurse. Because of the non-probability sampling technique used in the current study, the results may not be applicable to all HF patients. Thus, doing studies with random samples is suggested to avoid biases (allocation and selection). Larger sample sizes and more sophisticated statistical analyses would help determine the topic's importance. Furthermore, researchers recommend creating educational plans based on patients' disease knowledge to deliver effective interventions that are compatible with patients' HF knowledge. Despite these limitations, the study's findings demonstrate that patients' HRQOL enhanced as a result of the interventional follow-up phone calls, which should spark more research on this topic in chronic disease patients.

CONCLUSIONS

Despite significant advancement in HF management and prognosis, patients' HRQOL remains poor. The study results showed that interventional follow-up phone calls improved overall HRQOL in patients with HF. Although Saudi patients with HF usually receive self-management support and education during hospitalization and before discharge, they need ongoing support to increase self-care behaviours and reach long-term behavioural change. A follow-up phone call could be a method for continuity of post-discharge care. By providing empirical evidence, this research may motivate cardiology nurses to pursue such programs to improve the HRQOL in this population. Effective nurse-led intervention programs, conducted by experienced nurses, can be implemented by national healthcare systems in different countries. The recommendations of the program staff will reduce hospital readmissions, improve the HRQOL of patients with HF, and reduce costs due to hospitalization. Further interventional studies are required to evaluate the effect of these programs over time in chronic disease patients such as HF and cancer. Additionally, more research is needed involving more patients and centers to confirm the study's findings.

ORCID

Dhuha Youssef Wazqar  <https://orcid.org/0000-0001-6198-6537>

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