

Impact of a Nurses-Led Telephone Intervention Program on the Quality of Life in Patients with Heart Failure in a District Hospital of Greece

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Abstract

Background: Patients with chronic heart failure (HF) and their families experience a wide range of complex problems, which negatively impact the quality of patients' lives. Moreover, besides its debilitating symptoms, the disease necessitates frequent hospital admissions, imposing a financial burden on the health system.

Aim: To assess whether nurses-led telephone intervention on a regular basis in HF patients may upgrade the quality of their lives.

Material and methods: Telephone intervention lasted for 16 weeks in patients with confirmed HF type New York Heart Association (NYHA) II and III. The study population comprised 50 patients, male and female, who were randomly allocated into 2 groups: Group A, the intervention group and Group B, the control group. Each study group consisted of 25 patients. Data was collected via a questionnaire that was completed by the patients and that included demographic, social data and the "Minnesota Living with Heart Failure Questionnaire (MLHFQ)".

Results: Prior to the telephone intervention the MLHFQ score in group A was 50.88. In group B the score was 52.40. There is no statistical significance between the 2 groups. After the intervention the MLHFQ score in group A was 31.52 and in group B was 53.80. There is a statistically significant difference in the total score on the scale MLHFQ between patients in the 2 groups ($p < 0.001$). A statistically significant difference was also observed among scores from the first and the second measurement of patients between the 2 groups $p < 0.001$.

Conclusions: Our study indicates that the quality of life of HF patients post-telephone intervention improved significantly. However, there were no further significant correlations.

Keywords: Telephone intervention; Program; Heart failure; Quality life; MLHFQ

Background

Despite the progress in research on treatment of heart failure (HF), morbidity and mortality remain high [1]. Moreover, not only is it a clinical syndrome with poor outcome, but it also imposes a severe financial strain on the health system. Nine percent of HF patients after their discharge from the hospital will be re-admitted within a week, 23% of patients within a month and 41% within a year [2,3].

The symptoms and frequent hospitalizations negatively impact the quality of life of HF patients, [4] with both physical, social and emotional aspects of their lives and their life expectancy being significantly reduced [5-7]. However, avoidance of up to fifty percent of hospital admissions of HF patients may be achieved when these persons benefit from better nutrition, better compliance to medication, closer follow-up by a specialist and more discerning self-observation regarding worsening of their symptoms [8]. Thus, implementation of a disease management program (DMP) aiming at controlling risk factors can greatly contribute to improvement in their quality of life and to reduction of hospital admissions [9-11].

The assessment of the quality of life of HF patients is an important aspect in the designing of any intervention program [12]. These programs promote and improve patient's self-care behavior and ability to manage their life in a better way [13]. In most HF management programs developed in countries of Europe and America, nursing personnel were involved and the programs included patient's education and early recognition of symptoms of the disease. Usually these programs are carried out through telephone intervention, and the patient monitoring is designed for a set time-period [14]. Reports on these programs show improvement in the quality of life of HF patients, [15-17] and reduction of hospital admissions, days of hospitalization and overall cost [18-24].

Furthermore, data in the literature demonstrated that telephone intervention positively influenced the emotional status of respondents, while its focus on factors that support routine daily activities, such as managing symptoms, restriction of fluids, and exercise, was also seen to upgrade quality of life. Improving the ability of the individual to function better in daily life is very important for HF patients, as it enables them to remain active. Moreover, since heart failure is a condition associated with stress, fear and anxiety, nurses-led telephone intervention provides a sense of security to a major extent through educating patients how to act when

their symptoms worsen [25]. Knowledge about HF additionally upgrades their independence, as the patients discern symptoms and signs of deterioration and are prepared as to how to react [26].

Telephone support is a cheap, easy and effective alternative mode of care that is capable of supporting the individual needs of all patients, especially those in the transitional period immediately post-discharge from hospital [27-30]. During this period there is an increased frequency of relapse in patients' symptoms, leading to readmissions. Not only does this place undue stress upon patients but it also strains countries' health budgets: e.g. in the USA, frequent re-admissions of HF patients makes this disease the one with the highest hospitalization costs [31]. The main components of a disease management program are nurses, doctors and specialists highly specialized in HF who undertake the training of self-care patients and their families. Guidelines recommend that nurses specialized in HF must be able to provide the necessary education on medication, diet, exercise, and weight control, as well as actions to be taken in the event of worsening symptoms, and must also be able to follow up patients and their families to seek to ensure compliance to the course of treatment [32-34].

Many aspects of DMPs still require further research as to which HF patients will benefit the most from this kind of intervention and whether the value of the DMP for HF patients with stable ejection fraction is as clear as that of people with HF with reduced fraction extrusion [35].

Study Hypothesis

Regular nurses-led telephone intervention in HF patients may improve the quality of their lives.

Material and Methods

Study design

Telephone intervention was conducted in male and female patients, diagnosed with HF, confirmed by heart ultrasound and elevated plasma levels of natriuretic peptide BNP. Patients were randomly allocated into 2 groups. Group A was the intervention group and group B the control. Prior to and at the end of the intervention program, all patients in each group completed the study questionnaire. Patients in both groups had HF in accordance with the classification NYHA II and III. Telephone intervention lasted 16 weeks and was performed once a week. Each phone intervention lasted approximately 20 minutes.

Study population and sample

The study population was 50 HF patients, male and female. The sample selection was made irrespective of origin and marital or socioeconomic status. Two groups of patients were formed: Group A, the intervention group and group B, the control. Each study group consisted of 25 patients.

Data collection tools

Data was collected via a questionnaire completed by the patients and included demographic, social data and the scale "Minnesota Living with Heart Failure Questionnaire" (MLHFQ), which assessed the quality of the patients' life prior to and post the nurses' telephone intervention. Completion of the questionnaire lasted about 20 minutes.

Place and time of research

The study was conducted in patients in the prefecture of Ilia in Greece. Ilia is an area inhabited by around 200,000 people in the south-west part of the country. It lasted 16 weeks, from November 2010 to February 2011.

Inclusion and exclusion criteria

Patients aged 18 years and over and those who could be contacted by telephone were eligible for the study, while those unable to be reached by phone, or under 18 years of age were excluded from the study.

Encoding and statistical analysis

Each question in the questionnaire was transformed into a variable. The descriptive statistics (percentages) for the overall sample as well as for each group separately, for both the first and the second questionnaire were initially examined. For continuous variables, the observation was made by the average and standard deviation, while for continuous variables we used the independent samples t-test. The data were examined for normality with the Kolmogorov-Smirnov test, while Levene's test was used to verify the homogeneity of the fluctuations. To examine the association between demographic variables and the telephone intervention, the Pearson chi-square test was used. Data were analysed with the use of the Statistical Package for Social Sciences (SPSS) Vol. 17. A statistically significant difference was established when $p < 0.05$. For each pair of variables, first all the data were initially checked and then separated according to the first or second interview and/or group to which each belonged and its re-audited correlation. The control association was done with the Pearson chi-square test.

Intervention

The telephone intervention was led by 4 nurses. Their clinical experience ranged from 4-8 years and all worked in cardiology units. Telephone intervention was performed on a weekly basis for 16 weeks. Each phone intervention lasted up to 20 minutes depending on the severity of symptoms and the type of HF. Participants in group A received recommendations for the prevention of risk factors. Specifically, the recommendations focused on understanding the importance of refraining from smoking, of good control of blood pressure in hypertensive patients and blood sugar in diabetics, of maintaining normal body weight, and of changing dietary habits including avoidance of salt. Moreover, avoiding increased intake of fluids, limiting alcohol consumption and

preventing malnutrition were also recommended. The importance of introducing mild daily exercise was also underlined. Strict consistency in their medication regime, close observation of their symptoms (especially breathlessness and fatigue) and the control of oedema were also stressed. Patients were encouraged to communicate with the nurses if they had any further questions.

Results

Sex, age, marital and educational status, classification of HF according to NYHA and type of HF, frequency of hospital follow-up or hospitalization and the unit in which they were hospitalized for patients in both groups are shown in Table 1. No difference was observed between the average body weight of the 2 groups comprising the study population.

Table 1 Demographic data of the study population.

	Group A		Group B	
	n	%	n	%
Gender				
Male	18	72	16	64
Female	7	28	9	36
Education				
High school or Lower	4	16	2	8
High school graduate	11	44	13	52
University or College	10	40	10	40
Marital Status				
Single/Never married	4	16	3	12,5
Married	13	52	14	58,3
Divorced/Separated	8	32	7	29,2
Age				
50-60 years	4	16	7	28
>60 years	21	84	18	72
NYHA HF Class				
II	10	40	8	32
III	15	60	17	68
Diagnosis				
Ischemic HF	17	68	15	60

Table 3 Presentation of a statistically significant difference in scores between the two groups by using the MLHFQ after a telephone intervention at 16 weeks.

	Group	N	Mean	Std. Deviation	Std. Error Mean
SCORE	Interv	25	315,200	301,552	0,60310
	Routin	25	538,000	264,575	0,52915

Cardiomyopathy	8	32	10	40
Hospital follow-up frequency				
1/month	8	32	6	24
2/ month	8	32	19	76
2+ / month	9	36		
Hospitalization				
Short	10	40	11	44
Cardiology Clinic	14	56	14	56
Heart Unit	1	4		

Intervention on hospitalizations, weight and quality of life: in group A, a reduction in the frequency of hospital visits and the duration of hospitalization were observed (Table 2). In group B, a relative reduction in the frequency of hospital visits and the duration of hospitalization were observed. In group A the mean score on the MLHF scale decreased from 50.88 pre-intervention to 31.52 post-intervention, whereas in group B the relevant mean pre-intervention score was 52.40 and the post-intervention 53.80.

Table 2 Effects after intervention.

	Intervention group		Routine group	
	n	%	n	%
Hospital Frequency				
1/month	20	80	8	33.3
2/ month	5	20	16	66.7
2+ / month	0		0	
Hospitalization				
Short	22	88	13	52
Cardiology Clinic	3	12	12	48
Heart Unit	0		0	

There is a statistically significant difference in total score on the MLHF scale of patients between the 2 groups ($p < 0.001$) as shown in Table 3. A statistically significant difference was also observed between differences in score from first and second measurement of patients between the 2 groups, as shown in Table 4 ($p < 0.001$). No correlation between the NYHA degree with MLHF scale score or marital status was observed.

		T-test for Equality of Means						
							95% Confidence Interval of the Difference	
T	df	p	Mean Difference	Std. Difference	Error	Lower	Upper	
SCORE	Equal variances assumed	-27,769	48	<0,001	-2,228,000	0,80233	-2,389,319	-2,066,681

Table 4 Comparison of pre-test and post-test scores.

	Group	N	Mean	Std. Deviation	Std. Error Mean			
diff	Interv	25	-19,36	7,251	1,450			
	Rout	25	1,40	2,582	0,516			
		T-test for Equality of Means						
							95% Confidence Interval of the Difference	
T	df	p	Mean Difference	Std. Difference	Error	Lower	Upper	
diff	Equal variances not assumed	-13,486	29,99	<0,001	-20,760	1,539	-23,904	-17,616

Discussion

Our study shows that the nurses' telephone intervention program has a positive effect on quality life of HF patients NYHA II and III as evident by the total score in the MLHF scale between the two groups. In line with our findings are data in the literature also demonstrating similar results [36-39]. Improvement in the quality of life in the intervention group which delayed re-hospitalization only for the first six months and did not last more than twelve months was reported by other studies [40,41]. Taken together, telephone intervention programs appear to reduce the risk factors [42] and have a positive effect on self-care [43]. The quality of life is significantly improved when programs add education on self-care [11,44].

Regarding the impact of the intervention programs on patients' depression, conflicting results have been reported so far. Some report decreased depression, [45] while other studies noted no differences [30,46]. On the other hand, there were no statistically significant differences in studies that showed that the telephone support of patients is feasible, [27] the score on the MLHF scale decreased and the program seemed to be effective in patient outcomes [47]. In other studies where the quality of life was assessed with the MLHF scale, no significant differences were observed in the total scores between groups, [48,49] while in the present study we found significant differences in quality of life between the two groups ($p < 0.001$).

This can possibly be explained by the fact that the majority of study patients [48] were quite stable, as opposed to other studies where the patients were unstable, as for example immediately on discharge from the hospital after treatment and up to two weeks subsequently [18,50,51]. This may affect

the results and possibly explains why the telephone intervention by nurses did not improve their quality of life. The telephone intervention program implemented in stable patients with HF seemed to improve their quality of life on the MLHF scale [52,53]. Modern interventional heart rehabilitation programs, incorporating systematic training and information imparted to patients and which provides support and counselling have a significant impact on improving the quality of life and psychosocial factors.

In this study the incidence of hospital visits is frequent before the intervention, an issue also noted by other studies [54-56]. After completion of the intervention program, most patients visited the hospital only once a month, while before the intervention more than one third of the sample group visited hospital more than twice. These findings are consistent with a study which showed reduced readmissions after the intervention program, though not considerably, [47] while another study did not reveal any statistically significant differences [57].

It is noteworthy that in the intervention group of this study, readmissions were greatly reduced, but there is no statistical correlation between the frequency of visits to the hospital with the intervention. In other studies, there is a significant reduction in hospitalization rates and readmission time but without significant improvement in quality of life or mortality rates [9,11,58,59].

The average weight of patients in the intervention group decreased during the study period, in contrast to patients' weight in the routine group which increased, but neither reached statistical significance. Similar results have been reported in another study [38]. Other authors found that there was no relationship between quality of life and sex, [60] while

in another study differences were observed in how patients experience heart failure, with men showing social isolation as opposed to women who experience feelings of fear [61]. A study in which women evaluated the quality of their life more negatively and showed signs of depression displayed similar findings. Additionally, in other studies women evaluated their quality of life more negatively in comparison to men regarding their everyday lives and social activities [62-64].

Regarding age, the findings from different studies are conflicting as far as the relationship between age and quality of life is concerned and indicate that older patients do not necessarily experience a poorer quality of life. An older patient with heart failure is commonly found to enjoy a greater general satisfaction towards life and the fulfillment of objectives and dreams [65]. From our data analysis, this study found that 85% of the patients were over 60, a finding consistent with contemporary literature which argues that the prevalence of disease increases with age. The progressive aging of the population today, a global phenomenon of unprecedented proportions, will affect the incidence of heart failure over the coming years [66]. In other studies, there was no relationship between quality of life with sex, age, marital status and education [18,38], as the findings in this study have shown.

Primary school graduates and pensioners experienced more negative emotions than those of higher education and employees. Perhaps this finding may be related to age, since pensioners, as is known, are aged >65 years and the extent of their independence is limited. They may need help from another person to access hospital, they face difficulties in performing daily activities and they are likely to have low economic resources, all of which results in the negative evaluation of their quality of life [65-67].

A low level of education also seems to be responsible for the high rate of hospital readmissions [68]. The NYHA classification has a significant impact on the quality of life of patients with HF. In the present study this is not seen, as there is no significant statistical relationship with the score from the MLHF scale after the intervention. However, in other studies the higher the level of NYHA the poorer the quality of life of the patient [38]. These results are in accordance with other studies, [69-72] which observed that as the degree of their independence lessened, so much more negative was their view of the quality of life. Another study intervention program showed that patients with NYHA I and II exhibited an improvement in the quality of life after the intervention in contrast to patients with NYHA III [37].

From the aforementioned it is concluded that the more advanced the stage of heart failure and impaired functional capacity, the greater the restrictions upon the degree of independence become, even in routine daily activities performed by the individual, thus leading the individual to negatively evaluating their quality of life.

Conclusions

Heart failure continues to be an epidemiological, diagnostic, prognostic, therapeutic, and socioeconomic challenge. Despite the significant progress in heart failure therapy, prognosis and quality life of patients is still poor. Our results showed that the quality of life of patients with type NYHA II and III improved significantly after the nurses' telephone intervention program. However, apart from improving the quality of life as reflected through MLHFQ scale there were no further significant statistical correlations.

Limitations of the Study

The main limitation of this study is the relatively small sample, thus, due to its size it is difficult to generalize the findings. Another limitation to the internal validity is that the method of pre-test/post-test which the study provided may have given some participants the opportunity to deliberately change their answers. This would especially apply to those who knew they belonged to the intervention group and that, by influencing the study results, they could justify the effort and the time which nurses dedicated to them. Nevertheless, despite the limitations the results show improved quality of life through the program, and this should be the starting point for further research on this topic.

Recommendations

Effective programs such as these can be adopted by all national health systems. It is proposed that the program staff should be experienced nurses specialized in the subject of heart failure. Their provision of recommendations will result in the avoidance of hospital readmissions and the improvement of both the quality of life of the patients living with HF as well as a cost reduction in hospitalization. More research is needed over time to further evaluate this issue.

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