

## Effect of Tele-Nursing Instructions and Follow up on Self Care and Health Status of Patients with Heart Failure

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### Abstract

**Background:** Tele-nursing Instructions are essential for the management of heart failure disease. **Aim:** Evaluate the effect of tele-nursing instructions and follow up on self-care and health status of patients with heart failure. The design used in the study was quasi-experimental. The study was conducted in cardiology department at Assiut University Heart Hospital. **Sample:** 60 adult patients were male and female, purposively sampled split into study and control groups. **Tools:** **Tool (I):** Structured interview questionnaire **Tool (II):** "Dutch heart failure knowledge scale". **Tool (III):** "Heart failure self-care behavior scale". **(VI):** Cardiomyopathy questionnaire. **Results:** The present study revealed that (96.7%) of study group had high level of knowledge, (90.0%) had adequate self-care level, and (76.7%) with good health status after applying telenursing instructions. There were statistically significant differences among the study group before and after applying telenursing instructions at p. value (<0.05). **Conclusion:** Heart failure patients' knowledge level, self-care, and health status significantly improved after applying telenursing instructions. **Recommendation:** Enhance telenursing use in nursing practices and use it in conjunction with follow up phone to increase patients' compliance with therapeutic plans.

**Keywords:** Heart failure, Health status, Self-care & Tele-nursing instructions.

### Introduction:

Heart failure disease (HF) is a complex medical condition characterized by repeated hospitalization and increased worsening. (Pocock et al., 2022). HF hits 64.3 million individuals globally, and by 2030, that number is foreseeable to rise to 46% (Amy et al., 2020). It is a rapidly expanding public health concern. The European Society of Cardiology guidelines for diagnosing and managing heart failure recommended that patients after hospitalization schedule post discharge outpatient clinical consultations at predetermined intervals. (McDonagh et al., 2022).

Self-care is considered an effective method for managing HF disease and results in positive patients' outcomes, including enhanced quality of life, decreased mortality, and re-admissions rate Vellone et al., (2020). Teaching for HF patients emphasizes adherence to drug treatment, diet, decreasing symptoms, and fluid over-burden, and maintaining healthy lifestyle. Tele-nursing and persistent instructions are vital for giving HF patients with post-discharge education about therapeutic plan adherence, and accepting follow up care (Razu et al., 2021), (Son & Lee 2020).

Tele-nursing involves all types of nursing care and services that can be provided to overcome time and

distance boundaries and provide better way for nursing care. Tele-nursing is becoming a new approach to utilize a broad extent of advanced communication such as phone, fax and e-mail. Phone calls are frequently used in tele-nursing as are accessible to the most of people. Patient receives calls on periodical basis and gets instructions from healthcare personnel about treatment regimens (Patti & Denise, 2019).

Tele-nursing is considered one of the technological events as the gateway to modern nursing care. The use of phone, SMS and communication technologies with increasing technology growth and increasing access to nursing services. It is considered a quick access to nursing care by overcoming geographical barriers. (Sakinah & Nurdin., 2021).

### Significant of the Study:

Heart failure is a chronic disease that requires adherence to a therapeutic plan so self-care practice is necessary in long-term management for avoiding hospital readmission. Most of patients are incapable of attending hospital or clinics due to transportation issues. Therefore, this study was conducted to provide those patients with tele-nursing instructions and

follow up because it considers a quick access to nursing care by overcoming the distance and time barriers.

**Aim:**

Evaluate the effect of tele-nursing instructions and follow up on self-care and health status of patients with heart failure.

**Hypotheses:**

**H1:** Patients' self-care will be improved after applying tele-nursing instructions and follow up for the study group than the control group.

**H2:** Patients' health status will be improved after applying tele-nursing instructions and follow up for the study group rather than the control group.

**Patients and Methods:****Research Design:**

The design used in the study was quasi-experimental.

**Study Variables:**

The independent variable was the tele-nursing instructions while the dependent variables were self-care behavior and health status of patients with heart failure.

**Setting:**

The study was carried out in cardiology department at Assiut University Heart Hospital.

**Sample:**

A purposive sample (60) patients were adult, aged 18 to 65, who had been diagnosed with heart failure were divided into equal two groups: (n=30) study, and (n=30) control. Willing to participate in this study. Excluded those who had multiple advanced chronic diseases, auditory deficits and cognitive disorders.

**Sample size:** It was calculated using (G power software) as 60 cases. Calculated size of the sample for testing differences between two independent means two tailed. Used "power 95 %", "effect size 0.8", and "error 0.05"

**Tools:**

**"Structured interview questionnaire":** Established by researchers after reviewing the related recent literatures (Wong et al., 2022), (Abd Elaal et al., 2022).

**Part (I): Demographic Data** such as age, sex, occupation, marital status, and educational level.

**Part (II): Medical History:** It includes; duration of disease, chronic disease such as hypertension, diabetes mellitus, high cholesterol level, family and smoking history.

**Dutch Heart Failure Knowledge Scale:** It is used to evaluate patient's knowledge. It was adopted from Van der Wal, et al., (2005). It encompasses 15 points were assigned: 1 point for each right response, and 0 for any wrong or missing response. A score of less than or equal to 10 indicated poor knowledge,

while a score of more than 10 indicated good knowledge. The total score ranged from 0 to 15. In light of this, the following interpretation of the study's knowledge of heart failure score is: Low level of knowledge  $\leq 10$  score. High level of knowledge  $> 10$  scores.

**Heart Failure Self-care Behavior Scale:**

The scale is used to evaluate patients' self-care. It was adopted from Ostergaard et al., (2017). This scale covers 9 items inclusive six levels for answers, scores assigned to each item were between 1 and 5 points; 0 = none of the time, 1 = A little of the time, 2 = some of the time, 3 = A Good bit of the time, 4 = Most of the time and 5 = All of the time. All scores scaled 0 to 100 the better self-care had higher score, ( $\geq 70$ ) had adequate, ( $< 70$ ) inadequate self-care.

**Kansas City Cardiomyopathy Questionnaire (KCCQ): (Spertus & Jones, 2015).**

It was utilized to survey the health status of heart failure patients. (KCCQ) comprises of twelve items self-administered surveys. It consisted of four domains (three physical limitations, four symptoms frequency, two quality of life, and three social restrictions). Scores ranged from 0-100 for each domain, and often condensed into 25-point intervals, were used to depict health status. Scoring: 0-24 = (poor), 25-49 = (fair), 50-74 = (good), 75 to 100 = (very good).

**The tools' validity and reliability:**

Five experts checked on the study tools, two specialists within the field of cardiology Medicine staff and three specialists in medical-surgical nursing from Assiut University. The panel of experts reviewed the tools for clarity, relevance, comprehensiveness, simplicity, and applicability. No modifications for tools. The test reliability of data collection tools was ascertained with Cronbach's alpha test for the HF knowledge scale = 0.72, for the self-care scale = 0.84, and for the KCCQ questionnaire = 0.95.

**Field of Work:**

After approval was granted to gather data and the aim of the study was clarified, the researcher started data collection from February 2023 to July 2023. Data was collected during morning and afternoon shifts.

Four phases of the study were carried out: preparatory, planning, implementation, and evaluation.

**Preparatory phase:**

It involves establishing tools to collect data and developing instructions booklet based on currently available related literature using books, articles, and scientific journals.

**Ethical considerations:**

The research proposal was approved by ethical committee in faculty of nursing. Official permission was obtained from the head of Assiut University

Heart Hospital to gather data after study aim explanation. Oral consent and agreement were taken from patients and reassured them about the confidentiality after clarifying the nature and reason of the study. The studied patients were entitled to refuse to participate and/or withdraw from the study at any time without any reason.

**Pilot study:**

A pilot study was conducted on six patients with heart failure, (10% of the sample), to survey the reasonability, interpretability, and utility of the tools.

**Planning phase:**

Instructions booklet designed by researchers based on patient assessment needs and a review of the related literature. Designed with illustrations in a basic Arabic language. Contained brief and simple information related definition of disease and its causes, manifestations, lifestyle modifications such as healthy diet, exercises, physical activity, weight, compliance with medications and adherence to therapeutic guidelines and follow up.

**Tele- Nursing instructions:**

Consists of sending health teaching messages to the study group for 30 days through WhatsApp messages and shorting messages service (SMS). For illiterate patients, a telephone call was used. Message dependent on nursing instructions found within the booklet which reminded study subjects to medication adherence, follow a healthy lifestyle, and monitor their weight.

**Implementation phase:**

- After the goal and design of the study were explained to the patient, their voluntary participation was secured.
- Studied groups (study and control) were randomly selected.
- Researchers conducted one-on-one interviews with each study participant to gather information about their demographic characteristics, medical history, knowledge level, self-care practices, and overall health using four tools (I, II, III & IV).
- After patients were discharged, the researchers only gave tele-nursing instructions to the study group through telephone calls, daily Shorting Messages Service (SMS), and WhatsApp messages.
- Support booklet served as the foundation for the tele-nursing instructions' content.

**Evaluation phase:**

After one month, each participant within the study for both groups experienced an assessment to decide their information, care behavior, and health status using tools (I, II, III & IV) the researchers evaluated the effect of tele-nursing instructions on the level of knowledge, self-care behavior, and health status for study group patients.

**Statistical analysis:**

The data were categorized, analyzed and tabulated. Descriptive statistics as percentage, mean, and standard deviations using SPSS version 23. A statistically significant difference was at p. value less than (0.05). To determine significant differences for the numeric variables the t-test was used. To determine significant differences in the non-parametric variables the chi-square test was used. Also, Pearson Correlation was used.

## Results:

Table (1): Distribution of demographic characteristics of the studied groups

Demographic data	Study		Control		F-test	P-value
	No. (n=30)	%	No. (n=30)	%		
<b>Age:</b>						
18 to < 40	7	23.3	5	16.6	0.018	0.894
40 to < 60	15	50.0	17	56.7		
60 to < 65	8	26.7	8	26.7		
<b>Mean ± SD</b>	<b>49.2 ± 13.9</b>		<b>50.2 ± 13.5</b>			
<b>Range</b>	<b>18 – 65</b>		<b>18 – 65</b>			
<b>Gender:</b>						
Male	19	63.3	21	70.0	1.143	0.289
Female	11	36.7	9	30.0		
<b>Marital status:</b>						
Single	1	3.3	0	0.0	1.057	0.282
Married	23	76.7	26	86.6		
Divorced	3	10.0	2	6.7		
Widow	3	10.0	2	6.7		
<b>Education Level:</b>						
Illiterate	4	13.3	3	10.0	0.023	0.881
Read and write	15	50.0	15	50.0		
Primary education	2	6.7	2	6.7		
High education	9	30.0	10	33.3		
<b>Occupation:</b>						
Employee	8	26.7	8	26.7	0.085	0.771
Farmer	9	30.0	10	33.3		
Technician	5	16.6	4	13.3		
Housewife	8	26.7	8	26.7		

Chi-square test

\* Statistical significant differences (p &lt; 0.05)

Table (2): Distribution of studied groups related to medical data of patients.

Medical data	Study Group		Control Group		F-test	P-value
	No. (n=30)	%	No. (n=30)	%		
<b>Duration of disease:</b>						
> 5 years	8	26.7	5	16.7	2.453	0.123
< 5 years	22	73.3	25	83.3		
<b>Mean ± SD</b>	<b>4.1 ± 2.3</b>		<b>3.5 ± 1.5</b>			
<b>Hypertension:</b>						
Yes	22	73.3	23	76.7	0.345	0.559
No	8	26.7	7	23.3		
<b>Diabetes mellitus:</b>						
Yes	13	43.3	14	46.7	0.236	0.629
No	17	56.7	16	53.3		
<b>High cholesterol:</b>						
Yes	27	90.0	26	86.7	0.633	0.430
No	3	10.0	4	13.3		
<b>Family history:</b>						
Yes	16	53.3	17	56.7	0.236	0.629
No	14	46.7	13	43.3		
<b>Smoking history:</b>						
Yes	17	56.7	19	63.3	0.988	0.324
No	13	43.3	11	36.7		

Chi-square test

\* Statistical significant differences (p &lt; 0.05)

**Table (3): Distribution of the studied groups related to knowledge level about heart failure.**

Knowledge level	Study Group				Control Group				P-value1	P-value2
	Pre		Post		Pre		Post			
	No. (n=30)	%	No. (n=30)	%	No. (n=30)	%	No. (n=30)	%		
- Low level	26	86.7	1	3.3	28	93.3	27	90.0	0.988	0.016*
- High level	4	13.3	29	96.7	2	6.7	3	10.0		

One-way ANOVA

\* Statistical significant differences ( $p < 0.05$ )

P-value1: relation between pre-test of the study group &amp; control group

P-value2: relation between post-test of the study group &amp; control group

**Table (4): Distribution of the studied groups related to self-care behavior.**

Self-care behavior level	Study				Control				P-value1	P-value2
	Pre		Post		Pre		Post			
	No. (n=30)	%	No. (n=30)	%	No. (n=30)	%	No. (n=30)	%		
- Adequate	2	6.7	27	90.0	3	10.0	4	13.3	0.416	0.043*
- Inadequate	28	93.3	3	10.0	27	90.0	26	86.7		

One-way ANOVA

\* Statistical significant differences ( $p < 0.05$ )

P-value1: relation between pre-test of the study group &amp; control group

P-value2: relation between post-test of the study group &amp; control group

**Table (5): Distribution of the studied groups regarding health status**

Health status	Study				Control				P-value1	P-value2
	Pre		Post		Pre		Post			
	No. (n=30)	%	No. (n=30)	%	No. (n=30)	%	No. (n=30)	%		
Poor	28	93.4	1	3.3	29	96.7	27	90.1	0.155	0.018*
Fair	1	3.3	6	20	1	3.3	2	6.6		
Good	1	3.3	23	76.7	0	0.0	1	3.3		
Very good	0	0.0	0	0.0	0	0.0	0	0.0		

One-way ANOVA

\* Statistical significant differences ( $p < 0.05$ )

P-value1: relation between pre-test of the study group &amp; control group

P-value2: relation between post-test of the study group &amp; control group

**Table (6): Pearson correlation between knowledge level, self-care behavior, and health status for study group after applying telenursing instructions:**

Study group		Self-care behavior	Knowledge Level	Health status
Self-care behavior	Pearson Correlation	1	0.836**	0.844**
	Sig.	-	0.000***	0.000***
Knowledge level	Pearson Correlation	0.836**	1	0.845**
	Sig.	0.000	-	0.000
Health status	Pearson Correlation	0.844**	0.845**	1
	Sig.	0.000***	0.000***	-

**Table (1):** Illustrated the demographic features of the patient groups. The highest percentage of both (study and control) whose ages ranged between 40 to < 60 years, were male (63.3%, and 70%) respectively. Concerning the educational level half intended groups were read and write, concerning occupation most of the examined patients were farmers (30%, 33.3%) respectively.

**Table (2):** Showed the medical information of the groups. The greater percentage of intended patients with a duration of heart failure disease was < 5 year representing (73.3%, and 83.3%) respectively. Had hypertension (73.3%, 76.7%), high cholesterol level

(90%, 86.7%), family history of heart failure (53.3%, 56.7%), and were smokers (56.7%, 63.3%) respectively.

**Table (3):** Revealed the participant's information about heart failure disease. The study group had a high information level after application of tele-nursing instructions, and the highest percentage of both group had a low information level before application of it. A significant difference was between both groups control and study with ( $p < 0.05$ ).

**Table (4):** Revealed that the majority of participant groups had an inadequate level of self-care behavior before application of tele-nursing instructions while

study group had adequate level of self-care behavior post instructions. Significant difference was between two groups with p value (<0.05).

**Table (5):** Revealed that the majority of participant groups had poor level of health status before tele-nursing instructions while the study group had good post application of it. A significant difference was between two groups with p value (<0.05).

**Table (6):** Illustrated positive correlation between knowledge, self-care and health status for study group after applying of tele-nursing instructions.

### Discussion:

Tele-nursing is fast access to nursing care with a grip the geographical boundaries. Utilizing tele-nursing in patient care is required due to the development of innovation in nursing administrations (**Sakinah & Nurdin, 2021**). In respect to demographic data, our findings display that, the highest percentages of both study and control groups were men, and their ages ranged from 40 to less than 60 and were married. This result is reliable with **Lippi & Sanchis-Gomar (2020)** who expressed that there were more men than women in their study.

Concerning their educational level, half of participants in this study were written and read. This result is dependable with the findings of **Abd El-aal et al., (2022)** demonstrated that the larger part of the studied group was written and read. In terms of medical information, the findings of this study show that highest proportion of the studied sample had high cholesterol and hypertension. Related opinion of the researcher, aging may be the cause of this disease. Also, **Fahim et al., (2019)**, added that; hypertension was found to be the foremost predominant comorbidity illness among the study sample.

Our study's findings make it clear that more than 50% of the studied sample were smokers, with men being more likely to do so. Concurring opinion of the researcher, smoking is considered a predisposing factor for heart failure. Steady with the results of **Abd El-aleem et al. (2021)**, our information appeared that smoking and obesity accounted for the high rate of heart failure risk factors. Besides, these come with **Son & Lee's (2020)** clarification that smoking hoisted the worsening proportion in HF patients.

In this study, patients' knowledge about heart failure was found that the majority had low knowledge levels in both study and control groups. Along the same lines with **Fahim et al., (2019)** who cleared that most of the participants had low knowledge level. The current study clarified that the study group information progressed as a result of utilizing tele-nursing instructions and follow up. Study finding approves the hypothesis, which proposed that

applying tele-nursing instructions will raise the information level of HF patients.

These results are steady with those of **Weheida et al. (2022)**, who found that whereas most study and control groups needed information earlier to accept tele-nursing care, the study group information at the post and follow up stages for protocol of nursing care illustrated an outstanding advancement. Additionally, this study agrees with the study by **Mitter & Yancy (2017)**, which confirmed that a statistically difference in the study sample's total score of knowledge level pre/post application of nursing guidelines.

Based on this study finding, the larger part of both the study and control group displayed inadequately self-care behavior. In view to the researcher, this may be caused by insufficient understanding of heart failure disease, a lack of social bolster, anxiety, and self-care complexity. The current study found that the study group's self-care behavior was improved when the tele-nursing follow-up was applied. Significantly differences existed between both groups.

Regarding self-care behavior, our findings were consistent with the study by **Garandeh et al. (2019)**, which confirmed that telemonitoring influenced heart failure patients' care. By agreeing with them, telemonitoring made a difference in heart failure patients' behavior way better self-care, and the study group's self-care score at follow-up was impressively higher than the control group. Too, current findings inconsistent with study conducted by **Jamal et al., (2021)** which cleared that tele-health care includes the use of communication technologies and information to deliver health care at a distance and to support self-management of cardiac patients through remote monitoring.

Regarding health status of the participant sample, our study displayed that the highest percentage of participants were poor pre-application of nursing instructions. Health status of the study sample was improved after application of telecommunicating instructions. Concurring to **Urden et al. (2019)** mention that heart failure could be a clinical disorder characterized by commonplace symptoms such as weakness, lower leg swelling, and dyspnea.

And **Lavie et al., (2019)**, confirmed that the nursing guidance to patients with heart failure had a critical influence on change of information level and health status, certified the study's findings. The current study is confirmed with the study conducted in Egypt by **Mohsen et al., (2020)**, who mentioned that tele-nursing could be a valuable strategy for blood pressure, body mass index improvement and bringing down the chance of complications.

Moreover, this finding concurs with **Wong et al., (2022)** who reported that telehealth intervention enhances health outcomes. Where patients with

chronic conditions have seen advancements in their health results, such as decreased indication of seriousness and trouble. Regarding the relationship between knowledge, self-care and health status for studied patients our study illustrated a positive correlation. The researcher's opinion, this improvement is due to patients being provided with information through tele-nursing follow up.

This result is in line with the result of **Agastiya et al. (2022)**, who cleared that everyday self-monitoring and tele-nursing directives of disease-specific manifestations enhance self-management and turn away complications. The patient's self-care behavior progresses with more instruction. We clarify that patients with more education levels are able to reason and make choices for self-care behaviors, and they can effortlessly learn.

At last, the study illustrates a significant difference between patients' information and their self-care. The researchers explains that in arrange to alter self-care behavior, information is fundamental and significant. This result is consistent with **Patricia (2020)**, who found that self-care practices energized by phone-based self-management program, the telephone-experimental group's self-care, was quantifiably inside and out higher than the control group. From researcher's view, regular phone-based patient instructions is appropriate for effective self-care behaviors.

### Conclusion:

The conclusion of our study supported the hypotheses. Patients' knowledge level, self-care, and health status improved after applying tele-nursing instructions and follow up.

### Recommendations:

- Enhance tele-nursing utilization in practices of nursing and apply tele-nursing in follow up through phone services to provide ongoing teaching about self-care practice.
- Establish nurse-led telephone follow-ups (tele-nursing) supported with simplified and illustrated educational booklet regarding therapeutic compliance to improve health status for patients in health care sitting.

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