Assiut Scientific Nursing Journal
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Effect of Designed Nursing Guidelines on Modifiable Risk Factors among Patients with Heart Failure

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Abstract

Back ground: Heart failure continues to increase in prevalence with a great impact on morbidity and mortality. **The study amid to**: evaluate the effect of implementing designed nursing guidelines on modifiable risk factors among patients with heart failure. **Research design:** quasi-experimental research design (pre / post test) was utilized. **Setting:** The study was carried out in the Cardiology department at Al-Azher University Hospitals. **Sample**: Total number of (30) patients with heart failure pre / post were included. **Tools:** Patient structured interview questionnaire included: Part (I): demographic data. Part (II): Modifiable risk factor assessment .**Result:** less than three quarter of the studied patients 73.3٪ respectively were males, and aged ranged from 50>65. One-third of them 36.6٪ were educated. Highly statistical significant difference pre /post guidelines regarding some modifiable risk factors among patients with heart failure p =0.001.**Conclusion:** Some modifiable risk factors among patients with heart failure were significantly minimized after nursing guidelines implementation as effected in sodium restriction, maintained physical activity and smoking cessation. **Recommendations:** Replication of the study on a bigger probability sample obtained from various geographic areas in Egypt is needed in order to determine the key components of the issues.

Keywords: Heart failure, Modifiable risk factors & Nursing guidelines.

Introduction:

Heart failure (HF) is a global disease that affects millions of people each year and has a high fatality rate. The HF also known as congestive heart failure, affects an estimated 37.7 million individuals worldwide. It occurs when the heart is unable to pump enough blood to meet the body's needs. **(Ziaeian & fonarow, 2016).**

Heart failure is an increasing epidemic with substantial morbidity and mortality burden. Its prognosis is still poor despite the advances in evidence-based medical treatment and device therapy. Mortality varies between different studies; a large study on Egyptian HF patients has reported that all-cause mortality of HF was 5% while Europen HF survey reported that acute heart failure mortality varied from 8% to 20%. The risk of mortality and re-hospitalization is greater in acute than in chronic stable HF; the prognosis is still poor even after hospital discharge **(Ponikowski et al., 2016)**.

Class I of the New York Heart Association's (NYHA) functional classification of HF is defined as a person who has no limitations in any activities and no symptoms from everyday activities. Class II HF restricts daily activities just somewhat; the patient is comfortable at rest or with light exertion. Class III HF is a severe kind of HF with a narrow range of symptoms. Class IV HF is symptomatic at rest and becomes quite uncomfortable with any physical activity. This score documents the severity of symptoms and can be used to assess response to treatment. **(Canobbio et al., 2017).**

The goal of treatment is to alleviate symptoms while also preventing the disease from progressing. Infection, alcohol consumption, anemia, thyrotoxicosis, arrhythmia, and hypertension are all reversible causes of HF that must be addressed. **(Khan et al., 2019).**

Conditions that raise the likelihood of getting a disease are known as risk factors. Risk factors are either modifiable (i.e., they can be modified) or non-modifiable (i.e., they cannot be changed). (**Orsborne et al., 2017).**

Risk factors for patients with heart failure assessment diabetes mellitus, systolic blood pressure, antihypertensive medication use, hyperlipidemia, lipid-lowering medication use, use of hormone replacement therapy and lifestyle habits (smoking status, physical activity, alcohol consumption). These included additional risk factors such as male sex, left ventricular hypertrophy and obesity. In a separate study on overweight and obese individuals with diabetes mellitus, intensive lifestyle intervention with reduced caloric intake and increased physical activity

administered through counseling failed to reduce the risk of incident HF. **(Kotsis et al., 2018).**

The aim of the implementation nursing guidelines for persons with chronic HF are to extend their life, prevent acute decomposition, reduce symptoms and allowing them to participate in more activities. Excluding reversible factors, such as thyroid disease, anemia, chronic tachycardia, alcohol misuse, hypertension, and dysfunction, is critical when considering therapeutic choices. **(Bloom et al., 2017).**

The nurse must instruct the patients with heart failure about the risk factors that will help or aggravate the health condition. Reviewing information's about medications to be taken at home is essential to complete the full treatment and explain the dosage, action and side effects of all drugs and symptoms have decreased or subsided. Also, she must instruct the patients to avoid modifiable risk factors as certain foods sources that exacerbate their problem as coffee and restrict smoking, salty, spicy, fatty food. The nurse reinforces the importance of follow-up care and reporting of recurrence of symptoms**. (Santos et al., 2019).**

Significance of the study:

Based on the researcher's experience; observed that the number of heart failure patient continues to increase in prevalence about (1000 cases) in 2019 with a great impact on mortality& morbidity. Heart failure is a global pandemic affecting at least 26 million people worldwide and it is increasing in prevalence **Yasuhiro et al., (2021**). On Egyptian HF patients has reported that all-cause mortality of HF was 5% .In addition to the patients who suffer from HF often experience a decline in good progress and recurrent hospitalizations with debilitating symptoms. So these nursing guidelines designed to help such group of patients to identify and minimize the modifiable risk factors, prognosis of HF problem which associated with a worse.

The study aimed to:

Evaluate the effect of implementing designed nursing guidelines on modifiable risk factors among patients with heart failure.

Research hypothesis: Modifiable risk factors among patients with heart failure will exhibit after application of nursing guidelines.

Subjects and Methods

Research design:

Quasi-experimental research design (pre-post/test) was utilized.

Setting:

The data was gathered at Cardiology Department consist of 2 unit (one for male and other for female) each unit containing 8 bed in third floor at Al-Azher University Assiut Hospital.

Sample:

Total study subjects of 30 adult from (both sex) patients were selected from cardiology department's admission at Al- Azhar University Assiut Hospital. The participants were between the ages of 20 and 65 and volunteered to take part in the study. according to the following criteria.

Patients complained of signs and symptoms of heart failure and diagnosed clinically and with ECG, X-ray, and echocardiography EV<50 measured by 2D mood by short axis view and long axis view.

The sample was selected by using the following equation according to Steven K. Thompson (2012):

$$N = \frac{P(1-P) \times N}{P(1-P) + Z^2 \div d^2 \times (N-1)}$$

N= total patient population size of 80 who attended the cardiac department at Al Azhar university hospital. During year 2019 – 2020.

Z= confidence levels is 0.95and is equal to 1.96

D= the error ratio is = 0.05

P= the property availability ratio and neutral = 0.50

Tool of the study:

Tool 1: **Patients structured interview questionnaire:**

The researcher created it based on current national and international literature review **(Bloom et al., 2017)**, **(Santos et al., 2019),** and it divided into two sections:

Part (I): **Demographic data for patients:**

This part included information about sex, age, marital status, residence, educational level and occupation.

Part (II): Risk factors assessment: This part developed by the researcher based on literature review to assess modifiable risk factors as: obesity, kidney dysfunction, smoking (active or passive), alcohol intake, high blood cholesterol, medication compliance (medication low treatment adherence), sodium reduction, , diet (fat, salt), poor activity daily living, administration of other drug including anti-inflammatory drug, inadequate salt restriction, delay in drug absorption .

Design nursing guidelines:

This designed by the researcher from literature reviews based on patient assessment needs and the modifiable risk factors as: definition of heart failure (causes, symptom, treatment and complication) diet, maintained physical activity and smoking cessation ,

reduce weight, how to control blood cholesterol, hypertension and diabetes mellitus, importance of treatment adherence and behavioral strategies to promote health.

Face validity:

Face validity for the designed tool was judged by Jury of expertise three professor of medicine and medical surgical nursing at Assuit University they reviewed the tool of data collection for clarity, relevance, comprehensiveness, understanding, applicability and easiness.

Pilot study:-

In September 2020, a study was conducted on a group of ten percent of patients to assess the clarity and usefulness of the study tool (10 ٪) of the study sample (3 patients).This pilot study was conducted in one month before collection of data. The researcher follows test/retest technique. The goal of the pilot study was to identify any specific issues with the tool's clarity, feasibility, and application. The data from the pilot study was evaluated, and the assessment sheet was not changed, thus the patients who were chosen for the pilot study were included in the main trial.

Reliability: The reliability of the test calculated by using correlation coefficient and it was estimated by Alpha Cronbach's test for this study (0.95 and 0.87).

Protection of human rights (ethical considerations):

An official approval letter was obtained from the dean of the faculty of nursing and Ethical commit (ethical code 229). Official written permission to conduct the study was obtained by the researcher from the head of the Internal Medicine Department to collect the necessary data, after explain the aim of the study to obtain their cooperation. Then verbal permission with an explanation of the nature and aim of the study were obtained from clinical residents and head nurse of the unit. Also, a verbal consent was obtained from each patient to be included in the study. Clarification of the nature and purpose of the study was done on initial interview with each patient. The investigator emphasized that the participation is an absolutely voluntarily. Confidentiality of the subjects was certainly assured.

Data collection procedure:

Phase I: Preparatory and administrative phase: An official approval & The Faculty of Nursing granted permission for this study to be conducted. To the head of cardiovascular department at Al-Azhar University Hospital would gather the relevant information after explaining the aim of the study and the guidelines to them to obtain their cooperation.

Phase II: Implementation phase:

Once the permission was obtained to conduct the study, the researcher initiated data collection. Collection of data was started from the beginning of September 2020 to the end of February 2021.

- The researcher assigned study sample (30) patient individually.
- After discussing the nature and goal of the study, oral agreement was sought from the patients who were willing to participate.
- The researcher interviewed the patient to fill the questionnaire, each patient involved in the study was assessed using the study tool (1) parts (I,II) took 30 minutes pre nursing guidelines and post three months, every patient was interviewed for three times.

The first-interview used to collect the base line assessment data using the tool one part (I,II) in the department since patient admission and give the patients information about definition of heart failure (causes, symptom, treatment and complication).

The tool took about 30 minute for filling

Second interview took one hour for each to give information about modifiable risk factors and prevention (diet, exercise, medication, important of treatment adherence, follow up, life style modification, warning signs) before patient discharge.

The third interview after patient discharge for each patient from the study group to evaluate the effect of implementing design-nursing guideline using part II at the clinic of patient follow up took 30 minutes.

Some patient followed by phone during Covid 19 circumstances pandemic infectious disease in these days. The researchers ask about weight, medication adherence treatment, modifiable and non-modifiable risk factors, how to control and prevent risk factors, important to exercise and stop smoking.

Each patient involved in the study given a nursing guideline booklet and explain the content of the booklet in 2 session every session took about 30 minutes Information about function of the heart meaning of heart failure, Smoking: patient must to quit smoking, medication: instruct the heart failure patients about essential to complete the full treatment and explain the dosage, action and side effects of all drugs, exercise: as increase walking and other activities gradually, provided they do not cause fatigue or dyspnea and explore alternative activities that cause less physical stress, nutrition as counsel the patient about the dietary and other lifestyle measures, weight control and follow up

Phase (III) Evaluation phase:

The researcher evaluated the effect of designed nursing guidelines on modifiable risk factors among

patients with heart failure post 3 month of the implementation.

Statistical design:

The statistical analysis was interpreted to suit the research problem under investigation and was summarized in appropriate tables and charts. Data was inserted in computer programs through SPSS program. The following descriptive statistics tests, e.g., percentage, means and standard deviation were calculated. Tests for significance were applied, e.g., X^2. A probability level of 0.05 was adopted as a level of significance for testing the research hypothesis

Results:

Table (1): Frequency percentage distribution of studied patients regarding demographic data (n= 30)

Variables	N	%
Age :		
30- > 40	3	10.0
40-> 50	5	16.7
50-65	22	73.3
Sex		
Male	22	73.3
Female	8	26.7
Marital status:		
Single	2	6.7
Married	28	93.3
Residence:		
Urban	6	20.0
Rural	24	80.0
Level of education:		
Educated	11	36.6
Non educated	19	63.4
Occupation :		
Professional work	5	16.7
Manual work	6	20.0
Not work	19	63.3

Table (2): Frequency percentage distribution of studied patients regarding Echo cardiology ejection fraction (n=30)

	N	Minimum	Maximum	Mean± Std. Deviation
Ejection fraction	30	.00	48.00	32.20±13.03

Table (3): Comparison pre and post implementing nursing guideline regarding modifiable risk factor among studied patients (n=30)

Modifiable risk factor	Pre				Post				X2	Sig.
	Yes		No		Yes		No			
	N	%	N	%	N	%	N	%		
Obesity	27	90.0	3	10.0	27	90.0	3	10.0	.000	.665
Wight loss	25	83.3	5	16.7	25	83.3	5	16.7	.784	.266
Kidney dysfunction	8	26.7	22	73.3	6	20.0	24	80.0	.373	.381
Smoking	21	70.0	9	30.0	0	0	30	100.0	60.0	.001**
Alcohol intake	2	6.7	28	93.3	1	3.3	30	100.0	.351	.500
High blood cholesterol.	2	6.7	28	93.3	1	3.3	29	96.7	.351	.500
Medication compliance	22	73.3	8	26.7	25	83.3	5	16.7	.884	.266
Sodium reduction (< 2 mg/d)	6	20.0	24	80.0	26	86.7	4	13.3	26.78	.001**
Physical activity	5	16.7	25	83.3	23	76.7	7	23.3	21.69	.001**

Table (4): Relation between demographic data and patient diagnosis (n=30)

Variables	lower limb swelling		lower limb edema and orthopnea		lower limb edema, progress dyspnea, orthopnea		chest pain, orthopnea		recurrent burning pain and lower limb edema		Diabetes mellitus, hypertension, Chest pain		X2	P-value
	N	%	N	%	N	%	N	%	N	%	N	%		
Age by years														
30-	0	0.0	1	3.3	0	0.0	2	6.7	0	0.0	0	0.0	7.52	.67 ns
40-	0	0.0	1	3.3	0	0.0	3	10.0	0	0.0	1	3.3		
50-60yrs	4	13.3	5	16.7	1	3.3	11	36.7	1	3.3	0	0.0		
Sex														
Male	4	13.3	5	16.7	1	3.3	11	36.7	1	3.3	0	0.0	5.11	.40 ns
Female	0	0.0	2	6.7	0	3.3	5	16.7	0	0.0	1	3.3		
Level of education														
Higher education	1	3.3	0	0.0	0	0.0	1	3.3	0	0.0	0	0.0	11.7	.70 ns
Secondary school	1	3.3	3	10.0	0	0.0	4	13.3	1	3.3	0	0.0		
Read and write	2	6.7	2	6.7	0	0.0	6	20.0	0	0.0	0	0.0		
Illiterate	0	0.0	2	6.7	1	3.3	5	16.7	0	0.0	1	3.3		
Occupation														
Not work	2	6.7	4	13.3	1	3.3	11	36.7	0	0.0	1	3.3	6.37	.783ns
Manual	1	3.3	2	6.7	0	0.0	2	6.7	1	3.3	0	0.0		
Professional	1	3.3	1	3.3	0	0.0	3	10.0	0	0.0	0	0.0		

Table (1): This table represented of frequency percentage distribution of studied patients regarding demographic characteristics; less than three quarter of studied patients 73.3 ٪ were males, their aged ranged from 50>60 .The majority of the them (93.3٪) were married and had not work (63.3٪) and (80%) from rural . Regarding to level of education (63.4٪) were not educated.

Table (2): This table clarified mean of ejection fraction was 32.20±13.03 among patients with heart failure

Table (3): This table illustrated statistically significance difference t according to medication compliance, sodium reduction, physical activity and smoking pre and post implementation of nursing guidelines among patients with heart failure. (P. Value=.001)

Table (4): This table reported that there were not statistical significant relation between demographic data and patient diagnosis.

Discussion:

Findings of the current study ensured that the implemented nursing guidelines is one of the most important nursing responsibilities played an important role for patients with HF to minimizing the modifiable risk factors.

The bulk of the patients in this study were males, with the age ranging from 50 to 65 years old. This study result agreed with **Sulaiman et al., (2015)** who discovered a man's lifetime risk of HF at the age of 55.

In the present study highest percentage of the studied sample were smoker patients, this finding agreed with **Son & Lee. (2020)** who found that smoking in patients with HF increased the ratio of exacerbation.

As regarding to weight loss for studied patients as modifiable risk factor the present study verified that despite as sodium reduction and maintained physical activity displayed among the patients under study but they did not lose weight, and up to half of them leave the hospital with residual heart congestion, which indicated that they may need to return. From the researcher opinion this finding related to diuretic resistance which supported with **Packer et al., (2017) & Valente et al.,(2014)** who demonstrated that diuretic efficiency, rather than the absolute dose of diuretic defined as the effectiveness with which a diuretic can facilitate diuresis and natriuresis . Furthermore, half of all hospitalized patients had a poor first response to intravenous loop diuretics and classified as "diuretic resistant".

According to risk factors the present study founded that the highest percent of risk factor were obesity and smoking the result of this study was in line with a study by **Claudia , et al., (2017)** were mentioned that obesity, and smoking, were among the modifiable risk factors for HF. When compared to those who maintained or reached optimal risk factor control after nursing recommendations, those who maintained or achieved optimal risk factor control had a progressively lower risk of HF.

Also, the study result agreed with **David et al., 2020)** who claimed that obesity and current cigarette smoking put the patient with heart failure at risk for a worse HF prognosis. Or a body mass index of less than 25 kg/m2 and active cigarette smoking.

Concerning to sodium restriction, this study revealed that statistically significance difference in pre and post nursing guidelines this study result agreed with **Rami et al.,(2016)** who demonstrated that low dietary sodium intake seemed to be associated with minimize risk of HF patient prognosis and hospitalization.

The results of this study revealed that a small percentage of the patients were impaired in renal function (urea and creatinine level elevation) in pre nursing guidelines these results were consistent with **Palazzuoli et al., (2016) & Afsar et al., (2016)** They demonstrated that a fear of worsening renal function for patients with HF that causes resistance of their management ; However renal function improved with diuretic treatment for hospitalized patients .

Also the current study are supported by **Mendis et al., (2014)** who demonstrated that high dietary intakes of saturated fat, trans-fats, and salt have been related to an increased risk of HF, though whether all of these connections suggest causation is debatable. Furthermore, consuming high-energy foods on a regular basis, such as processed foods heavy in fats and sweets, promote obesity and may raise cardiovascular risk.

In this study regarding to echocardiography mean of ejection fraction of patients with HF was 32.200±13.03 this outcome was in agreement with **Butler et al., (2014)** Who stated that the diagnosis of HF, which is used to characterise HF, is historical and based on the left ventricular ejection fraction (LVEF) measurement. Patients with HF range from those with a normal LVEF [usually viewed as 50%; HF with preserved EF [(HFpEF) to those with a reduced LVEF [usually viewed as 40%; HF with reduced heart failure with reduced ejection fraction (HFrEF)]. Patients having an LVEF of less than 50%.

The researcher point of view that such nursing guidelines for heart failure patient minimize the modifiable risk factors among them. Suitable intervention packages need to be developed and in service education need to be given periodically for the effectiveness of qualitative nursing services

Limitations of study

1. The majority of study sample had transportation and budgetary issues.
2. Because the sample was drawn from a single geographic area in the Arab Republic of Egypt (ElAzhear University Hospitals), the investigation findings are limited in their generalizability.
3. Some patients followed up after 3 months by telephone, because the presented problems prevent them from going to the hospitals (Covid 19 pandemic).

Conclusion:

The following conclusions can be drawn from the study's findings:

some modifiable risk factors among patients with heart failure were significantly minimized after nursing guidelines implementation as effected in sodium restriction, maintained physical activity and smoking cessation.

Recommendations:

- Replication of the study on a bigger probability sample obtained from various geographic areas in Egypt is needed in order to determine the key components of the issues.
- Implantation nursing program to identify and exhibit the exacerbation of heart failure.

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