

Effect of Applying Designed Nursing Guidelines on Health Outcomes among Patients with Heart Failure Class III

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Abstract:

Background: Heart failure continues to increase in prevalence with a great impact on morbidity and mortality. **Aim:** To evaluate the effect of applying designed nursing guidelines on health outcomes among patients with heart failure class III. **Research design:** Quasi-experimental (pre & post assessment) design. **Setting:** The study was carried out in the Inpatient Cardiology Department at Al-Azher University Hospitals & affiliated Outpatient Cardiac Clinic. **Sample:** A purposeful sample of (30) patients their ages ranged from (20–75) years old from both sexes. **Tools:** tool (I): – Patient Structured interview questionnaire. **Tool (II):** Dutch Heart Failure Knowledge Scale. **Tool (III):** Structured Outcomes Assessment of Patient with Heart Failure. **Results:** there was statistical significant difference as regarded total knowledge score level, diet categories & red, yellow zone exacerbation signs and symptoms of the study sample in relation to all items in pre & post nursing guidelines with P. value < 0.001 **Conclusion:** significant improvement in health outcomes among patients with heart failure class III post nursing guidelines application in form of dietary modifications, knowledge improvement, reduce worsen exacerbating signs & symptoms. **Recommendation:** Study risk factors associated with preventable heart failure exacerbations at regular intervals after hospital discharge

Keywords: *Health Outcomes, Heart Failure Class III & Nursing Guidelines*

Introduction:

Heart failure (HF); is a clinical syndrome that affects (64.3) million people worldwide who have (HF), with the number expected to rise to (46%) by 2030. HF affects 1% to 2% of the adult population in affluent countries (Amy et al., 2020). It is widely recognized that is a complicated disease in which anatomical or functional cardiac defects prevent ventricle filling or blood ejection from the left ventricle. HF affects those over the age of 65 in a disproportionately high number of cases. Shortness of breath, which is frequently worse with physical activity, excessive weariness, shortness of breath while lying down, which may disturb the person at night, and lower limb edema are all common clinical manifestations for patients with heart failure (Schlembach et al., 2018). New York Heart Association (NYHA) Classified patients with HF Functional into one of four groups based on their physical activity limitations and the severity of their symptoms; Class 1: There are no restrictions on physical activity. Normal physical

exertion does not result excessive exhaustion, palpitation, or dyspnea (shortness of breath). Class II: (Mild) Physical activity is restricted slightly. At rest, when patient relaxing; fatigue, palpitation, and dyspnea are common side effects on regular physical exertion (shortness of breath). Class III (Moderate) Significant restriction on physical activity; at ease when at rest. Unusual activity results in weariness, palpitations, or dyspnea. Class IV: (Severe) Unable to carry on any physical activity without discomfort. Symptoms of heart failure at rest. If any physical activity is undertaken, discomfort increases. (New York Heart Association 1994) & (Yuau & Zhi 2020).

Heart failure exacerbation is a clinical diagnosis based on at least 1 of the following signs and symptoms: early satiety, weight gain, increasing belly girth, exertional dyspnea, weariness, paroxysmal nocturnal dyspnea, orthopnea, and cough. Physical examination results may show peripheral edema, hepatomegaly, and abdominal distention. (Galvez-Barron et al., 2019)

Common factors that predispose to exacerbation heart failure include coronary atherosclerosis ,cardiac infection, hypertension, myocardial ischemia, pneumonia ,chronic obstructive pulmonary diseases, anemia, dyslipidemia, diabetes mellitus, cigarette smoking ,sedentary patient behavior body mass indexes and emotional stress (Christiansen et al., 2017) & (Elgandy et al., 2019).

Health outcomes is the activities that follow a therapeutic intervention. These can be clinically assessed through (physical examination, laboratory testing, and imaging), self-reported, or seen (such as sign fluctuations seen by a healthcare provider or caregiver). Accurate nursing assessments and recommendations are necessary to assess health outcomes for patients with HF. (Lee & John, 2020)

Nursing guidelines to improve patient with HF health outcomes should on minimizing the common modifiable factors that contributing to HF exacerbations in older adults, such as uncontrolled hypertension, noncompliance with treatment, excessive oral or intravenous fluid consumption, infections, especially pneumonia, sepsis, or urinary tract infection, anemia, and renal insufficiency (As GFR 30 mL/min) (Precoma et al., 2019). Also nursing guidelines for patient with HF emphasized on promoting physical activities, reducing fatigue, relieving fluid overload symptoms, and decrease anxiety level (Riegel et al., 2019).

Dietary guidelines for patient with HF; health care provider should consult the written diet plan and list of permitted and restricted foods. To find out how much sodium is in type of food administer to the patient, look at the label. Look for salt on the labels of over-the-counter pharmaceuticals such laxatives, cough medications, and antacids. When preparing or adding salt to foods, use as little as possible (Reicks et al., 2018).

Nurses have critical role to the success of patient education since they frequently provide discharge instructions to patients, and all patient with HF need to understand how to monitor and report their symptoms and weight changes, limit their sodium intake, follow their doctor's prescribed drugs schedules, and maintain an active lifestyle. Also teach the patient to notify health care provider about the manifestations of worsening HF diseases, such as weight gain of more than 3 lb (1.3 kg) in a week or 2 lb (0.9 kg) overnight, pain in jaw, neck, or chest; increased shortness of breath or fatigue; dizziness or syncope; swelling in feet, ankles, legs, or abdomen; palpitations; and racing heart (>120 beats per minute) (Morton & Fontaine, 2017).

The purpose of this study was to investigate the effect of nursing guidelines on the health outcomes among adult patient with HF in connection to

hypothesized improvements in health outcomes of the study group of patients with HF in relation to dietary guidelines & improvement in knowledge level and minimize exacerbation S&S after guidelines implementation.

Significance of the study:

Heart failure is a major clinical and public health problem with high prevalence, incurring extraordinary health care expenditures and negatively influencing patient's activities during the daily living. Nursing assessment and development of patient educational materials based on practice guidelines for patient with HF is a very important key component to improve patient health outcomes. This study focused on evaluating effect of designing and implementing nursing guidelines on the outcomes of patients with heart failure especially exacerbation signs and symptoms.

Operational definitions:

Nursing Guidelines: are statements that include nursing recommendations intended to optimize patient with HF care. The guidelines include assessment of HF-related symptoms; non-pharmacologic strategies for management of HF, such as diet, physical activity, routine healthcare maintenance, this was supported by (Neale et al., 2017).

Health outcomes: A predetermined measurement outlined in the study's criteria that is used to assess how participants' therapeutic actions have affected the health condition of patient with HF.

Health outcomes measured by these three key elements:

- A change in heart failure patient health status, the outcome is the result of a health intervention such that there is a before and after assessment (i.e., a pre- and post), the health outcome is an actual measured component of the study this was supported by (Lee & John, 2020).

Heart failure class III: Systolic dysfunction characterized by an ejection fraction of 40% or less, whereas diastolic dysfunction is characterized by impairment in one or more markers of ventricular filling and a matching clinical presentation. this was supported by (Hunt et al., 2021).

Aims of the study:

The study aims to evaluate the effect of applying designed nursing guidelines on health outcomes for patient with HF class III through:

1. Assessing knowledge level & dietary pattern among patient with HF class III.
2. Designing and implementing nursing guidelines for patient with HF class III based on their identified needs.

3. Evaluating the effect of applying designed nursing guidelines on health outcomes of patient with HF class III

(The outcomes in the current study refer to the dietary regimen modifications, improve patients knowledge level about the disease and minimize exacerbation HF S &S)

Research hypothesis:

Research hypotheses were formulated as the following:

Hypothesis (0): Application of the nursing guidelines will not improve health outcome of patients with heart failure.

Hypothesis (1): Health outcome of patients with heart failure will improve post nursing guidelines application than before.

Patients and method:

Research design: A quasi experimental research design with one group (Pre- and Post-test assessment) was used. It is a form of quasi-experiment study in which the desired outcome is measured twice: before and after exposing a non-random set of subjects to a particular intervention or treatment. There are three primary aspects of the one-group pretest-posttest design: It's a quasi-experimental design because the group of patients who get the intervention isn't chosen randomly. There isn't a control group to compare the results with, as the patient compares with his own self so all variables are stable, and the improvement was due to the intervention only. So, comparing pre- and post-intervention data, the intervention's effect is determined as the only effect which improves patients' outcome [Andrea & John \(2019\)](#).

Study variables:

The independent variable in this study is the design nursing guidelines, whereas the dependent variables are the health outcomes of patients with heart failure class III.

Setting:

The study was conducted in the Cardiology Department at Al-Azher University Hospitals from November 2019 to July 2020. The department is located on the second floor and consists of 8 rooms, two rooms for intermediate care, and 6 rooms for inpatient care males and females each room has eight beds. This is due to the increase in the number of patients attending Al-Azher University Hospital annually, mainly patients suffering from congestive heart failure, and/or more than cardiac disorders, hoping to reach the provision of the best nursing service that helps patients live in the best health level.

Sample Size determination and sampling technique:

A purposeful sample of (30) adult patients' diagnosis with HF, (males and females) age ranged from 20-75 years old and agreed to participate in the study, who were admitted in the Inpatient department and attended for follow-up in Outpatient Clinic affiliated to the Cardiology Department at Al Azhar University Hospital.

A convenience sampling technique was used to select the study participants.

Sample Size:

A power calculation estimated that in order to detect an effect size of one group (pre / post test) with a p-value < 0.05 and 80% power, confidence level 0.95, so a sample size of (30) patients was needed.

Eligibility Criteria:

The study selected according to the following criteria: all patients diagnosed as HF and conferred the diagnosis clinically by ECG, X-ray, and echocardiography, EV > 50 measured by 2D mode by short axis view and long axis view, aged 20 years old and above, admitted to the Cardiology department and complaining of signs and symptoms of HF. Patients with heart failure, who are admitted to the intensive care unit (ICU) were excluded from the study.

Tools of the study:

Three tools were used to collect data, as the following:

Tool 1: Patient Structured Interview Questionnaire:

It was developed by the researcher based on current national and international literature review [Adebayo et al., \(2017\)](#), [Masri et al., \(2018\)](#), [Precoma et al., \(2019\)](#). The tool including two parts:

Part (I): Demographic data of the studied patients:

This part includes information about patient demographic characteristics it contains (7) items; age group, gender, marital status, residence, educational level, work, and years of being diagnosis with heart failure.

Part (II): Assessment of Patient medical data:

This part aimed to assess the following.

- A-** Reading of the electrocardiography, which consists of (8 items) (Sinus tachycardia, Atrial fibrillation, long PR interval, Residual ST elevation, AF with cardiomyopathy, decrease T wave III, Normal sinus, or ST elevation in V1-V2).
- B-** Patient's family history assessment (6 items): regarding diabetes mellitus, coronary diseases, hypertension, myocardial infarction, respiratory diseases, or renal disease.
- C-** Assessment of patient's predictors factors of heart failure (6 items); as hypertension, diabetes

mellitus, cardiomyopathy, [transient ischemic attack](#), or atrial fibrillation, bronchial asthma.

D- Assessment of patient's present complaints including (7 items); dyspnea, lower limb swelling, & orthopnea, dizziness & fainting, worse persistence cough at night and fast heart rate.

- In addition to assess the most common nursing diagnoses according to priority including (6 items); reduced cardiac output, risk for excess fluid volume, risk for impaired gas exchange, activity intolerance, knowledge deficit, and anxiety level.

Tool (II): Dutch Heart Failure Knowledge Scale (DHFKS): The scale was developed by [Martje et al., \(2005\)](#). It was utilized to assess the knowledge of adult patient suffering from HF. This instrument contains 12 multiple-choice questions that cover the following topics: (4) items addressing the meaning and causes of heart failure in general and (5) items about HF symptoms recognition and (3) items regarding to fluid restriction and activity. **Scoring system:** For each item patients can choose from two options, one of the options is the correct response. When a patient provides the correct response, 1 point is awarded to that question; however, if the answer is incorrect or missing, a person is awarded "0" points for that question. Patients' knowledge total scores classified as: satisfactory level of knowledge, which equal $\geq 70\%$ or unsatisfactory knowledge level $<70\%$. Satisfactory knowledge score means better health outcome. The reliability of the DHFKS was reported 0.62, so it can be used in research because this instrument is valid and reliable scale

Tool (III): Structured Outcomes Assessment of Patient with Heart Failure.

This tool aimed to assess health outcomes of patients with HF through comparing between the following parameters pre and post nursing guidelines: it contains of 2 parts.

Part (I): Assessment of Dietary Pattern among Patients with Heart Failure:

This part handled the assessment of the studied sample pre/post application of the study intervention, it was included (19) questions regarding their diet modifications in consumption of the following: fruits, vegetables, grains, with avoiding of (fat and excess sugar products), fish, legumes, and the reduce sodium intake.

Part (II): Exacerbation signs and symptoms of heart failure.

It adopted from [Bolzani et al., \(2017\)](#). [Canobbio et al., \(2017\)](#) [Schlembach et al., \(2018\)](#).

This part was used to assess the exacerbation signs and symptoms of heart failure that divided into three zones; the green zone: all clear (no shortness of

breath, no weight gain, no chest pain), the yellow zone: caution (weight gain, increased cough, increase in shortness of breath with activity, increase in the number of pillows needed, anything else unusual that bothers the patient) and the red zone: medical alert (unrelieved shortness of breath, unrelieved chest pain, wheezing or chest tightness at rest, need for chair to sit in while sleeping, weight increase or loss of more than 5 pounds in two days, or confusion

No worsening of patients with heart failure symptoms or signs this suggests an improvement in patients' health outcomes.

Procedure:

An official approval & administration permission to conduct this study was obtained from the head of Cardiovascular Department at Al-Azhar University Hospital after explaining the aim and nature of the study and the nursing guidelines to them to obtain their cooperation. The study conducted in **four phases (preparatory phase, planning phase, implementation phase and evaluation phase)**.

Phase (I) Preparatory phase:

It includes developing the study methods for data collection and develop the nursing guidelines by reviewing the national and worldwide related literature in the various elements of the problem utilizing books, papers, periodicals, and magazines.

Tools Validity and Reliability

Face validity: It was established with a review of the content by five experts, (two professors from Medical-Surgical Nursing staff from Faculty of Nursing, Assuit University & two Cardiologists' professors, at Faculty of medicine, Assuit University hospitals, who were involved in the care of patients with HF Who reviewed the tools for clarity, relevancy, comprehensiveness, understanding and applicability. Minor modifications were required, and correction was carried out accordingly.

Reliability: For this study, the reliability of the tools was determined using the Alpha Cronbach's test and the correlation coefficient was (0.719, 0.84, 0.782 & 0.735) respectively.

Ethical approval:

Official written permission to conduct the study was obtained by the researchers from the head of the Cardio-vascular department to collect the necessary data, after explaining the aim and nature of the study to obtain their cooperation. An informed approval from patients who are willing to participate in the study was attained after explaining the nature and aim of the study. Also, a verbal consent was obtained from the clinical residents and head nurse of the department. The researcher emphasized for each patient that participation in the study is voluntarily, and they have the right to withdraw from the study at

any time and this will never affect the care they receive. Confidentiality and anonymity of the participating data was certainly assured.

Pilot study (exploratory phase):

It was carried out in November 2019 to evaluate the clarity, feasibility, and applicability of the study tools on a group of (10%) of the study sample (3 patients). This pilot study was done one month prior to data collection. The researcher employs the test-and-retest method. The data from the pilot study was analyzed, and the assessment sheet was left unchanged, thus the three patients chosen for the pilot study were included in the main study group.

Phase (II) Planning phase:

Nursing Guidelines:

Following an exhaustive literature study and considering patients' needs identified during analysis of the pretest regarding patients' levels of knowledge, nursing guidelines were developed based on the findings of the exploratory phase.

Designed nursing guidelines:

These guidelines were designed by the researchers after literature review [Al-Sutari, et al., \(2017\)](#) [Arora et al.,\(2017\)](#), [Kristiansen et al., \(2017\)](#) & [Lavie et al., \(2019\)](#) and based on patient assessment needs: it contained a brief explanation about heart failure definition, causes, signs and symptoms, monitoring of vital signs and blood glucose level, physical activity modifications (modalities which promote rest for the patient in order to oxygen demand, keeping away from noise to ensure emotional rest, avoiding air pollution to prevent respiratory distress, also avoiding both active and passive smoking), diet modifications (low salt is encouraged to minimize the risk of fluid retention, small servings of soft prepared to minimize the effort for mechanical digestion and decrease energy demand, also large meals place pressure on the heart, thus increasing the workload, patients are advised to maintain a Semi-Fowler position after meals to alleviate pressure from the heart), medications (patients are advised on each medication's precautions and side effects to prevent treatment related setbacks). Also, patients with heart failure are strongly advised about the importance of follow up and performing the diagnostic examinations ordered by the physician especially chest X rays and ECG) as well the provision of health education to the patient and the family around the issues of; monitoring exacerbation sign & symptoms, diet and physical activity modifications, medications adherence and follow up investigations and treatment.

Phase (III) Implementation phase (5 sessions):

Data collection lasted for 9 months through the period from November 2019 to July 2020

- An informed consent was obtained from patients willing to participate in the study, after explaining the nature and purpose of the study.
- Each patient participating in the study was interviewed individually by the researcher to fill in the questionnaire sheet.

Each patient was interviewed five times.

- The first one conducted during the base line assessment (to assess demographic data, family history, clinical manifestations and factors contributing to exacerbation of heart failure using tool (I) it took (from 15 - 30 minutes).
- The second interviews conduct to assess dietary pattern & knowledge level among patient suffering from HF, in addition to exacerbation signs and symptoms using tool (II & III), it took (from 30 - 45 minutes).
- The third & fourth interviews used to implement the nursing guidelines each of them took (from 30 - 45 minutes).
- The fifth interview; was conducted after one month post patient discharge in the Outpatient at the Cardiology clinic to evaluate health outcomes of patients with HF through comparing between the following parameters pre and post nursing guidelines (assessment exacerbation signs and symptoms of heart failure according to the three zones & knowledge & dietary pattern assessment of heart failure patients using tool II & III, it took (from 30- 40 minutes).

Phase (IV) Evaluation phase (fifth interview):

During this phase the researchers evaluated the effect of applying the designed nursing guidelines on the health outcomes of patients with heart failure. The fifth interview done one month post application of the nursing guidelines using tool (II & III).

Data entry and statistical analysis:

The statistical analysis was interpreted to suit the research problem under investigation and was summarized in appropriate tables and charts using SPSS program version 23. The following descriptive statistics tests, e.g., percentage, means and standard deviation were used as appropriate. Tests for significance were applied, e.g., X^2 , t-test, Correlation coefficient (r) between continuous variables. A probability level of 0.05 was adopted as a level of significance for testing the research hypothesis.

Result

Table (1): Frequency & percentage distribution of the studied patients regarding demographic characteristics (no. 30)

Variables	n.	%
Age group:		
30 - < 45	3	10.0
45 - < 60	17	56.7
60 – 75	10	33.3
Gender:		
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:		
High education	2	6.7
Secondary school	9	30.0
Read and write	10	33.3
Illiterate	9	30.0
Work:		
Professional work	5	16.7
Manual work	6	20.0
Not working	19	63.3
Years of being diagnosed with heart failur		
Less than 5 years	22	73.3
From 5 – 10 years.	8	26.7

Table (2): Frequency & percentage distribution of the studied patients regarding electrocardiography reading (ECG) (n=30)

ECG abnormalities	n	%
Sinus tachycardia	4	13.3
Atrial fibrillation	9	30.0
Long PR interval	4	13.3
Residual ST elevation	1	3.3
AF with cardiomyopathy	1	3.3
Decrease T wave III	2	6.8
Normal sinus	8	26.7
ST elevation in V1-V2	1	3.3
Total	30	100.0

Table (3): Frequency & percentage distribution of the studied patients regarding family history (no. 30)

Variables	n.	%
Diabetes mellitus	8	26.6
Coronary diseases	3	10.0
Hypertension	12	40.0
Myocardial infarction	2	6.7
Respiratory diseases	3	10.0
Renal disease	2	6.7
Total	30	100.0

Table (4): Frequency & percentage distribution of the studied patients regarding predictor factors of heart failure (n=30)

Variables	n.	%
Hypertension	6	20.0
Diabetes mellitus	7	23.3
Cardiomyopathy	2	6.7
Transient ischemic attack	9	30.0
Atrial fibrillation	5	16.7
Bronchial asthma	1	3.3
Total	30	100.0

Table (5): Frequency & percentage distribution of the studied patients regarding present complaints (n=30)

Complaints	n	%
Progress dyspnea	5	16.7
Lower limb edema & orthopnea	7	23.3
Dizziness and fainting	13	43.3
Persistent cough, which may be worse at night	3	10.0
Tachycardia	2	6.7
Nursing diagnosis:	n.	%
- Risk for reduced cardiac output	4	13.4
- Risk for fluid volume excess	13	43.3
- Risk for impaired gas exchange	1	3.3
- Activity intolerance	3	10.0
- Knowledge deficit	7	23.3
- Anxiety	2	6.7
Total	30	100.0

Table (6): Comparison between knowledge level pre & post (after one month) application the designed nursing guidelines among patient with heart failure class III (n=30)

Knowledge items Scale	Pre				Post (after one month)				X2	Sig.
	Yes		No		Yes		No			
	n	%	n	%	n	%	n	%		
General information										
What does HF mean & causes	17	56.7	13	43.3	29	96.7	1	3.3	13.41	0.001
Symptom of HF recognition	10	33.3	20	66.7	17	56.7	13	43.3	6.66	0.002
Cause a rapid worsening of HF symptoms	23	76.7	7	23.3	28	93.3	2	6.7	30.24	0.001
Activity allowed & restriction	16	53.3	14	46.7	29	96.7	1	3.3	15.55	0.001
Fluid allowed, restriction & weight monitoring	21	70.0	9	30.0	30	100.0	0	0.0	10.58	0.001

(*) Statistically significant at $p < 0.05$, $P > 0.05$ no Significance, *** $P < 0.000$ highly Significance.

Table (7): Comparison between pre & post (after one month) application of the designed nursing guidelines among patients with heart failure class III regarding diet modifications (n=30)

Diet	Pre				Post (after one month)				X2	Sig.
	Yes		No		Yes		No			
	n	%	n	%	n	%	n	%		
Eat fibers & Fruits	23	76.7	7	23.3	29	96.7	1	3.3	5.19	0.02
Vegetables & grains	17	56.7	13	43.3	29	96.7	1	3.3	13.41	0.001
Avoid excess coffee \ tea	10	33.3	20	66.7	20	66.7	10	33.3	6.66	0.01
Eat fat	23	76.7	7	23.3	2	6.7	28	93.3	30.24	0.001
Avoid excess sugar	16	53.3	14	46.7	2	6.7	28	93.3	15.55	0.001
Eat fish	21	70.0	9	30.0	30	100.0	0	0.0	10.58	0.001
Eat legumes	9	30.0	21	70.0	12	40.0	18	60.0	0.659	0.294
Drink prescribed water daily	9	30.0	21	70.0	13	43.3	17	56.7	1.148	0.211
Eat balanced diet	10	33.3	20	66.7	4	13.3	26	86.7	17.77	0.001
Avoid excess salt	6	20.0	24	80.0	26	86.7	4	13.3	26.78	0.001

Table 8: Comparison between exacerbation signs and symptoms pre & post (after one month) application of the designed nursing guidelines among patients with heart failure class III (n=30)

Zones items	Pre				Post (after one month)				X2	Sig.
	Present		not present		Present		not present			
	N	%	n	%	n	%	n	%		
Green Zone: All Clear										
Shortness of breath	3	10.0	27	90.0	0	0.0	30	100.0	3.15	0.119
Little weight gain	1	3.3	29	96.7	0	0.0	30	100.0	3.15	0.119
Chest pain	1	3.3	29	96.7	0	0.0	30	100.0	3.15	0.119
Yellow Zone: Caution										
Increased weight gain.	8	26.7	22	73.3	0	0.0	30	100.0	9.23	0.002
Increased cough	4	13.3	26	86.7	1	3.3	29	96.7	1.96	0.177
Increased swelling	16	53.3	14	46.7	1	3.3	29	96.7	18.4	0.001
Increase in shortness of breath with activity	18	60.0	12	40.0	1	3.3	29	96.7	22.25	0.001
Increase in the number of pillows needed	15	50.0	15	50.0	1	3.3	29	96.7	16.70	0.001
Anything else unusual that bothers the patient	3	10.0	27	90.0	0	0.0	30	100.0	3.158	0.119
Red Zone: Medical Alert										
Unrelieved shortness of breath: shortness of breath at rest	15	50.0	15	50.0	1	3.3	29	96.7	16.70	0.001
Unrelieved chest pain	6	20.0	24	80.0	1	3.3	29	96.7	4.043	0.05
Chest tightness at rest	10	33.3	20	66.7	1	3.3	29	96.7	9.017	0.001
Need to sit in chair to sleep	1	3.3	29	96.7	0	0.0	30	100.0	1.017	0.500
Massive weight gain.	3	10.0	30	100.0	0	0.0	30	100.0	---	---

(*) Statistically significant at $p < 0.05$, $P > 0.05$ no Significance, *** $P < 0.000$ highly Significance.

Table (1): This table represent the frequency & percentage distribution of the studied patients regarding demographic characteristics; (73.3%) of the studied patients were males, (56.7 %) their age ranged from 45 to less than 60 years old, (93.3 %) were married, (80.0 %) from rural area, regarding level of education one third of them (33.3 %) were read and write and more than half of them (63.3 %) were not working. In addition, the table showed percentage distribution of studied patient regarding to duration of HF diagnosis, it was found that (73.3 %) were less than 5 years and (26.7 %) ranged from 5-10 years.

Table (2): This table displayed the abnormalities of the Echocardiography (ECG) found among the studied patients; respectively, (30.0 %) of patients were having atrial fibrillation (AF), (26.7 %) normal sinus, and an equal percentage of (13.3 %) for both long PR interval and sinus tachycardia.

Table (3): This table reveals that; (40.0 %) of the studied sample has a family history of hypertension, (26.6) of patient's family having diabetes mellitus, in addition to, an equal percentage of (10.0) for both coronary & respiratory diseases. Also, myocardial

infarction and renal disease both had an equal present of (6.7%) among the study group.

Table (4): This table showed; percentage distribution among the studied patients regarding the predictor factors of heart failure; as (30%) of the studied patients had ischemic heart diseases, (23.3 %) had diabetes mellitus, (20%) had hypertension in addition a quarter of them had atrial fibrillation (16.7 %)

Table (5): This table showed; percentage distribution of the studied patients regarding patient's complaints; (43.3 %) of patients with heart failure complained of dizziness and fainting, also (23.3%) having lower limb edema & orthopnea. While (16.6 %) had progress dyspnea, in addition (10.0 %) had recurrent persistent cough, which may be worse at night. As regard nursing diagnoses according to priority (43.3 %) of patients with heart failure at risk for excess fluid volume, (13.3) & risk for decreased cardiac output, while (23.3 %) of them having knowledge deficit.

Table (6): The table showed that; there was statistical significant difference between the total level of knowledge score of the study sample in relation to definition of HF, causes, factors that lead to rapid worsening of HF symptoms, activity allowed

& restriction, fluid allowed & restriction, weight monitoring items during pre & post nursing guidelines implementation with P. value < 0.001.

Table (7): This table showed diet modifications among the studied patient's pre and post application of the designed nursing guidelines; as (23.3 %) of the studied patients were not consuming fibers & fruits pre study, this percentage decreased to only (3.3 %) post application of the study. Regarding vegetables (56.7%) only of the study group were consuming it pre study, this increased to (96.7 %) post study. while (33.3 %) of the study group used to avoid excess drinking of coffee & tea pre study implementation which increased to (66.7) post the application of the designed nursing guidelines. Regarding fat consumption; (76.7 %) used to consume fat pre application of the study which decreased to only (6.7 %) post application of the designed nursing guidelines. Sugar products consumption pre application of the designed nursing guidelines was (53.3 %) this has decreased to only (6.7 %) post the application of the designed nursing guidelines. Fish consumption was (70.0%) pre the application of the designed nursing guidelines. and increased to (100.0 %) post the application, also, (86.7 %) reduced their sodium intake in diet post study application compared to (20.0 %) pre study with a highly statistically significant difference in all the previously mentioned diet categories with a P value of (0.001), while there was no statistically significant difference between the studied patients pre and post application of the designed nursing guidelines in fibers & fruits eating with a P. value of (0.02).

Table (8): This table illustrated that there was not statistically significance difference between patients assessment result in the pre and post-test regarding to the green zone exacerbation signs and symptoms with P. value equal (0.119). Regarding yellow zone exacerbation signs and symptoms; (26.7 %) of patients had weight gain in pre-test compared to (100.0 %) not having it posttest with a P. value equal (0.002). Also in pre-test (53.3%) of the studied patients complained from lower limb swelling compared to (96.7 %) not complaining of it during the post-test with P. value equal (0.001), also in pre-test (60.0 %) of the studied patients had increased shortness of breath with activity compared to (96.7 %) not complaining of it in the post-test assessment with P. value equal (0.001). Regarding the increased number of pillows needed (50.0 %) of the studied patients complained of it in the pre-test while in the post assessment (96.7 %) not complaining of it with P. value equal (0.001). For the red zone exacerbation signs and symptoms; (50.0 %) of the studied patients had shortness of breath at rest in pre-test compared to only (3.3%) in post-test. Regarding the unrelieved

chest pain (20.0 %) of the studied patients complained of it the pre assessment and only (3.3%) in the post assessment and for the chest tightness at rest (33.3%) of patients complained of it pre application of the study compared to (3.3%) only post application of the study with P. value equal (0.001).

Discussion:

This study was conducted to evaluate the effect of applying designed nursing guidelines on health outcomes for patient with HF class III in the form of dietary modifications, knowledge improvement, and in minimizing exacerbating signs and symptoms of heart failure.

Regarding demographic characteristics of the studied patients in the current study, it was found that; the majority of the studied patients were males, married, the highest percentage of them their age ranged from 50 to less than 60 years old. **Lippi & Sanchis-Gomar (2020) finding in their study are** in concordance with the result of the current stud. As they reported that the participants in the intervention group of their study consisted of participants identified with a primary diagnosis of heart failure and followed for two month post discharge, there were slightly more married males compared to females. And in the same line with the study conducted by **Savji et al., (2018)**, who mentioned that women have a significant lower incidence rate of heart failure compared to men at all age categories and also, similarity to the study done by **Mishraa et al., (2018)**, who reported that the mean age of patient with HF in their study ranged from (52.2 to 62.8) years old. But disagree with the study done by **Zheng et al., (2021)**, who verified that participants' mean age was 75.3 ± 6.88 years old. From the researcher point of view, the age category differences among patient with HF vary depending on numerous factors including the stage of their strength of their heart function. Other disorders that weaken the heart could contribute to the development of HF, including congenital heart diseases, drug or alcohol abuse, or lifestyle pattern which associated with chronic diseases as (DM, HIN)

According to the study findings; abnormalities of the ECG found in the studied patients; revealed that about quarter of the studied patients were having atrial fibrillation this agree with **Oskouie, et al., (2017)**, who reported that there is high variability in the prevalence of ECG abnormalities among patients with HF. Atrial fibrillation is more common compared to QRS duration which associated with worse health outcomes among patients with HF.

Regarding to the family history; the present study verified that the highest percent of the studied sample had family history of hypertension, and one quarter of the studied patient's families were having diabetes

mellitus, this in the same line with the studies conducted by [Manas et al., \(2020\)](#), who confirmed that it has been difficult to distinguish a family history of diabetes as a separate risk factor for heart failure. Strong risk factors for predicting the development of HF among family members include familial hypertension as well. People with hypertension are twice as likely to a condition of family history members with normotension. Regarding to the distribution of the studied patients according to predictor factors of heart failure; the current study found that , the highest percentage among the studied sample were ischemic heart diseases, this result supported by [Rysiak et al., \(2018\)](#), who revealed in their study that ischemic heart disorder causes exacerbation symptoms. among patients with heart failure

Furthermore, the current study result is in the same line with the study conducted by [Heusch, \(2020\)](#), who confirmed that when blood flow to the heart is diminished, myocardial ischemia happens because the heart muscle is not getting enough oxygen. This is because hyperglycemia and hyperinsulinemia accelerate atherosclerosis through vascular smooth muscle cell proliferation and inflammation. Most frequently, a partial or total blockage of the heart's arteries causes the diminished blood flow (coronary arteries). Additionally, cardiac ischemia, also known as myocardial ischemia, reduces the heart's capacity to pump blood. Repeated ischemia episodes may eventually cause heart failure (HF).

Globally, the study result agree with [Hassanin, et al., \(2020\)](#), who founded that the prevalence of Diabetes Mellitus varied significantly across their study, as it is a reason for a HF exacerbation. Furthermore, the study done by [Dei Cas et al., \(2015\)](#), who mentioned that type 2 diabetes mellitus consider as a predictor factors for heart failure, among all patients with heart failure, Diabetes Mellitus independently contributes to the development and progression of heart failure. In addition, Diabetes Mellitus complicates the management of heart failure , in addition to [Kenny & Abel \(2019\)](#), in their study mentioned that Diabetes Mellitus could lead to cardiac dysfunction independently of other cardiovascular diseases called (diabetic cardiomyopathy). It causes structural heart disease and HF via myocardial ischemia/infarction.

The present study revealed that below quarter of the study sample had hypertension this agrees with [Zareini et al., \(2020\)](#), who said that uncontrolled high blood pressure could lead to a fatal heart attack as arteries narrow, which causes difficulties in providing blood to the heart. Hypertension could harm the quietly of important organs in patients' bodies for years before HF symptoms appear. When

the blood flow to heart's is restricted, a patient may develop angina, arrhythmias, or a heart attack. Heart must work harder to pump blood to the rest of the body when blood pressure is out of control. Due to this, the left ventricle of the heart thickens. Heart attack and heart failure exacerbation risk are both increased by a thickened the left ventricle. The current finding is in the same line with a study done by [Porkodi & Melba \(2020\)](#), who verified that the patient in the geriatric stage adjusted to the highest prevalence of hypertension which is a major contributor to their high rates of HF exacerbation symptoms. Also agree with [Johansson et al., \(2016\)](#), who explain that hypertension, which significantly worse blood pressure control prevent the progression of HF.

The present study revealed that the minority of the study sample were presented with cardiomyopathy, this disagree with the study done by [Hassanin, et al., \(2020\)](#), who reported that the second most common etiology in Alexandria and Delta Upper Egypt, were dilated cardiomyopathy (DCM). In Cairo, DCM and valvular heart disease came in the second position of the cases.

As regarding to the distribution of the studied patients regarding patient's present complaints; the present study mentioned that dizziness and fainting have the most complain among patient with HF this agree with [Unverzagt et al., \(2016\)](#), Who reported that chronic HF is characterized as a progressive worsening of ventricular function and chronic neuro-hormonal activation those results in ventricular remodeling these leading to developed limitation of patient activities and fatigue. Thies finding agree with the study conducted by [Thomas \(2016\)](#), who demonstrate that fatigue: is one of the earliest symptoms of chronic HF. The patient notes fatigue after usual activities and eventually limits these activities. The fatigue is caused by decreased CO, impaired perfusion to vital organs, which decreased oxygenation of the tissues, which lead to feeling tired all the time and difficulty with everyday activities, such as shopping, climbing stairs, carrying groceries or walking.

Also the current study finding agree with the study conducted by [Ceron et al., \(2020\)](#), and [Yuan & Zhi-Yuan \(2020\)](#), who describe dyspnea as a symptom of chronic HF. It results from pulmonary hypertension which brought on by interstitial and alveolar edema. Dyspnea could happen when at rest or during light exercise. Dyspnea frequently comes with orthopnea. Also this finding agree with the study conducted by [Zandstra et al., \(2020\)](#), who clarified that edema is a typical HF symptom. If the patient is lying in bed, sacral and scrotal edema may develop independently of other body locations (peripheral

edema). Finger pressure on edematous skin may temporarily depress it (pitting edema).

As regarding nursing diagnoses according to priority among patients with HF; the current study verified that highest percent of the sample have a risk for excess fluid volume, and about a quarter of the sample have a lack of knowledge related to diseases process & prognosis, this agrees with the study conducted by **Larissa et al., (2016)** who reported that fluid volume excess mostly common with patient with HF class III. But disagree with the study done by **Vellozo et al., (2016)**, who mentioned that decreased cardiac output was more prevalent in hospitalized patients with HF, and the associated defining characteristics were determining factors for this nursing diagnosis. Furthermore, the present study reported that, the nursing diagnosis of activity intolerance was found in low prevalence patients with HF, probably the justification for this contradiction is due to the fact that the patient is in a comfortable position on the bed while he is in the hospital and therefore this matter cannot be inferred

The current study shows a statistical significant difference as regarded total knowledge score level of the study sample in relation to (HF mean & causes, symptoms cause a rapid worsening of HF, activity allowed & restriction, fluid allowed and restriction & weight monitoring items pre& post nursing guidelines application this agree with the study done by **Mitter & Yancy (2017)**, who mentioned that, the continuous education significantly improve patients' knowledge level and awareness of their disease. This study finding was also supported by **Al-Sutari, et al., (2017) & Lavie et al., (2019)**, who found that the nursing guidelines for patient with HF class III had a significant effect on the improvement of knowledge score and health outcomes. This result supports the study hypothesis which suggested that HF patient's knowledge level will improve after implementing the nursing guidelines.

As regarding to dietary modifications among HF patient the present study showed improvement in diet compliance among the studied patients post the application of the designed nursing guidelines regarding vegetables consume grains, fat consumption and reduced their sodium intake in diet post study compared with the pre assessment, this agree with **Sezgin et al., (2017)**, who reported that the nursing care and follow-up program applied in the intervention group improved dietary compliance among patients with HF

Also in the same line of the study conducted by **Porkodi & Melba (2020)**, who verified that educating patients about HF dietary recommendations and the consequences on patient health outcomes been shown to improve post nursing guidelines

application. Instructions such as daily consumption of 2–3 g of sodium and fluid restriction recommended strategies regardless of the stage of HF. Also agree with the study conducted by **Reicks et al., (2018)**, who demonstrate that the nursing instruction using the written diet guidelines & list of permitted and restricted foods help in improving dietary parameters for patient with HF.

In addition to the study done by **Liam et al., (2021)**, who explained that there was a statistically significant difference between pre-post dietary guidelines demonstrations for patient with HF regarding to sodium “indiscretion” is considered a common and potentially modifiable precipitant of HF decompensating.

According to exacerbation signs and symptoms, the study illustrated that there was no statistically significance difference between patient's pre and post-test regarding the green zone exacerbation symptoms this is due to the fact that the characteristics of the study sample suffer from HF class III stage

The present study demonstrate a statistically significance difference between patient's pre and post nursing guidelines demonstrations regarding the patient in yellow & red zone exacerbation signs and symptoms, this is in the same line with study done by **Sartipy, et al., (2017)**, who mentioned that the long-term goal of nursing gaudiness is to avoid exacerbation of HF and decrease hospital readmission rates. This achieved by inter professional approach involving patients, physicians, nurses, pharmacists, families. That nursing guidelines includes early identification of high-risk patients, patient education, improving medication and dietary compliance, assuring close follow up which monitoring the occurrence of the worse signs and symptoms. These inter-professional collaborations optimized patient health outcomes in HF cases. Also in the same line with the study by **Ariely et al., (2019)**, who reported that monitoring of exacerbation signs and symptoms post patient discharge, dietary regimen, medication adherence could be effective in decreasing complications in patients with HF.

The preset study summarize that a significant improvements in outcomes for patients with III stage HF in form of minimizing HF exacerbation signs and symptoms, this is in the same line with the study demonstrate by **Taylor et al., (2017)**, who support the application of heart failure guidelines to improve patient health outcomes by early monitoring of exacerbation HF symptoms. There is strong evidence supporting the benefit of direct patient contact in the post-discharge from the outpatient clinic by the professional nurses and proper medical consultation to improve health outcomes exactly like what has

been implemented in the current study. Also in the same line with this study done by **Clarkson et al., (2017)**, who demonstrate that educational and follow-up programs conducted under the supervision of the nursing staff improve patient with HF ability to perform their own follow-up and adapt to treatment to overcome progression of HF exacerbation signs and symptoms

The results declared that in accordance with study hypotheses, the nursing guideline, enriched with educational interventions, could significantly affect health outcomes of patient with HF class III. This is achieved through improving health out come

Conclusion:

The study's conclusions supported the research hypotheses. Significant improvement in health outcomes among patient with HF class III post nursing guidelines application in form of dietary modifications, knowledge improvement, reduce worsen exacerbating signs & symptoms.

Recommendations:

- Study the factors associated with preventable heart failure exacerbations post hospital discharge.
- Study the effects of exercise training program on Health outcomes among patients with heart failure.
- Effects of self-care and quality of life outcomes among patients with heart failure

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