- *Basic Research*

Relationship between Multi-Dimensional Factors and Self Care Behaviors among Patients with Heart Failure

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Abstract

Background: Heart Failure is a chronic, longstanding disease associated with high morbidity, mortality, and increased health care cost. Self care activities have been illustrated to improve quality of care of heart failure and disease outcomes. **Aim:** This study aimed to assess the relationship between multidimensional factors (knowledge, cognitive impairment, anxiety and depression, social support, quality of life) and self care behaviors among patients with heart failure. **Study design:** A descriptive co-relational research design was utilized to achieve the aim of this study. **Setting:** This study was conducted in the heart department at Ain Shams University hospital. **Subjects**: Purposeful sample of (60) adult patients with heart failure were selected to included in this study. **Tools of Data collection:** (1) Patients' demographic and clinical characteristics assessment tool. (2) The dutch heart failure knowledge scale. (3) Mini-mental state examination scale. (4) Patient health questionnaire-4. (5) The social support instrument. (6) The Kansas City cardiomyopathy questionnaire. (7) The self-care heart failure index. **Results:** This study revealed that 78.3% of patients with heart failure had unsatisfactory level of knowledge, 33.3% have cognitive impairment, 40% suffered from moderate level of anxiety and depression, 80% got high social support from their families, and 70% had fair quality of life. Moreover, it was illustrated that there was a correlation between the self-care behaviors and knowledge, cognitive impairment, anxiety and depression, social support, and quality of life among patients with heart failure where p value <0.05. **Conclusion:** Several factors are positively/negatively correlates with self care behaviors among patients with heart failure such as the knowledge of patients, cognitive impairment, anxiety and depression, level of social support, and quality of life. **Recommendations:** Ongoing assessment of factors that may impedes self care behaviors among patients with heart failure can help health care professionals in providing disease management based on individual needs.

Keywords: *heart failure, multi-dimensional factors, patients, self care.*

1. Introduction

Heart failure (HF) is considered a chronic progressive disease with alarming morbidity and mortality impacts. It is described as an epidemic health problem with an estimated prevalence of 64.3 million people worldwide. Heart failure is account for 250,000 to 300,000 hospital admissions and about 30,000 deaths per year in the United States *(Groenewegen et al, 2020).* The data available from hospital based studies at Sub Saharan Africa (SSA) show that heart failure is the most common diagnosis among patients admitted with cardiovascular diseases and accounts for up to 9-15% of hospital admissions *(Kimani, et al, 2018).*

It is a systemic complex clinical syndrome characterized by cardiac dysfunction that reduces the heart ability to pump sufficient amount of blood to meet the metabolic needs of tissue. HF has recently been classified into three subtypes based on calculated left ventricular ejection fraction (LVEF), natriuretic peptide levels and the presence of structural heart disease and diastolic dysfunction. These types are named as HF with reduced ejection fraction (HFrEF), HF with preserved ejection fraction (HFpEF) and HF mid-range/mildly reduced ejection fraction (HFmrEF). The latter may composed of both left ventricular dysfunction (systolic and diastolic heart failure) *(Malik et al, 2021).*

The definition of HFrEF has varied among different studies and guidelines but is generally defined as an ejection fraction (EF) of less than or equal 40%. Heart failure with preserved ejection fraction (HFpEF) is generally known as heart failure with an EF of more than or equal 50%. HFmrEF is called heart failure with an EF of 40% to 49% based on European Society of Cardiology guidelines *(Hajouli & Ludhwani, 2022).*

Heart failure illness is linked by common biological risk factors such as hypertension, increased cholesterol level and central obesity, as well as behavioral risk factors that include smoking, excess alcohol consumption, unhealthy diet, and physical inactivity which lead to metabolic syndromes. Many of these risk factors are potentially preventable through awareness and education of self-care behaviours that need to be adjusted or changed to control the disease and improve quality of life *(McHorney et al, 2021).*

Self-care refers to the process or behaviors that people use to maintain health through preventive and promoting practices. The self care behaviors in heart failure consist of three main concepts that include self-care maintenance which keep physiological stability through patients' actions (e.g., taking medication as prescribed, engaging in regular physical activity regimen, and adhering to a healthy diet through restricting dietary sodium and fluid intake), self-care monitoring or perception of symptoms (e.g., regular weighing, monitoring clinical signs and symptoms), and self-care management that mean the response to symptoms when they occur (e.g., change diuretic dose in response to

symptoms, consultation with a nurse or physician when changes are recognized) *(Jaarsma et al, 2021).*

There are numerous and multidimensional factors that may impede self care process among patients with heart failure such as demographic and clinical characteristics of patients (e.g. patient's age, gender, level of education, ethnicity, socio-economic status, past experience in living with symptoms of chronic disease), the problem (e.g. cognitive function, knowledge about the disease, depression and anxiety symptoms, rest and sleep periods, co morbidity, severity of HF according to New York Heart Association [NYHA] functional classification) and factors related to environment (e.g. family and social support, location, quality of life, values) *(Negarandeh et al, 2020).*

The management of heart failure is a complex process that requires daily coordination of and adherence to several medications and a set of lifestyle changes related to dietary restrictions, fluid intake, exercise, and weight monitoring. Self-care is considered an important non pharmacological aspect of heart failure management that stabilizes physiological symptoms and results in improved health outcomes, avoid deterioration of HF, prevent subsequent co morbidities, reduce contacts with the health care system such as recurrent hospital admissions, as well as reduce health care costs and mortality and morbidity *(McHorney et al, 2021).*

1.1 Significance of the study:

Based on the European Society of Cardiology Heart Failure Long Term (ESC-HF-LT) Registry, that involved patients from April 2011 to February 2014. A total of 1661 hospitalized HF patients from Egypt were included, of whom 1645 were eligible for analysis: 914 from Alexandria, 249 from Cairo, 409 from the Delta region, and 73 from Upper Egypt *(Hassanin et al, 2020).*

Heart failure is normally the final stage of all heart diseases. The clinical symptoms of heart failure includes shortness of breath, orthopnea, exertional dyspnea, fatigue, weakness, edema, weight gain, memory loss, anxiety, depression, headache, insomnia and oliguria. These symptoms can be managed by medication, changing lifestyle and performing self-care activities. The success of treatment of heart failure relies on patients' behaviors and adherence to treatment plan. Lack of self care skills and knowledge among patients with heart failure may accelerate the progression of the disease, increase intensity of symptoms, frequency of hospitalization and health care costs. Assessing the factors affecting self care for patients with heart failure can help to reduce the rate of un-necessary re-admission, complications, worsening of symptoms, and death and improve the quality of life for those patients.

1.2 Aim of the study

This study aimed to assess the relationship between multidimensional factors (knowledge, cognitive ability, anxiety and depression, social support, quality of life) and self care behaviors among patients with heart failure through:

a) Assessing knowledge of patients with heart failure.
b) Assessing cognitive impairment of patients with heart failure.
c) Assessing anxiety and depression level among patients with heart failure.
d) Assessing social support level among patients with heart failure.
e) Assessing quality of life of patients with heart failure.
f) Assessing self care behaviors among patients with heart failure.

1.3 Research questions

1. What are the level of knowledge, cognitive impairment, anxiety and depression, social support, quality of life and self-care behaviors among patients with heart failure?

2. What is the relation between the self-care behaviors and knowledge, cognitive impairment, anxiety and depression, social support, and quality of life among patients with heart failure?

2.Methods

2.1 Research design

A descriptive co-relational study design was utilized to achieve the aim of this study. In descriptive co-relational study, the investigator looks into co-relations between variables without control or manipulates any of them. Co-relational studies reveal the magnitude and/or direction of a link between two (or more) variables. Co-relational studies design might have either a positive, negative or zero co-relation *(Sharma, 2018).*

2.2 Setting

This study was conducted in the heart department at Ain Shams University hospital Affiliated to Ain Shams University. The heart department is located in the first floor of the hospital and composed of five rooms, each room contains three beds.

2.3 Subjects

Purposeful sample of (60) adult patients with heart failure who were admitted to the previously mentioned setting were selected to included in this study according to certain inclusion and exclusion criteria. The size of sample was calculated based on power analysis according to the number of heart failure patients who were admitted to the heart department at Ain Shams university hospital during the year 2021, was 170 patients with power of test 90% and confidence interval 95%, with margin of error accepted adjusted to 5% with type I error (α) = 0.05, type II error (B) = 10%, and power of test 0.80%.

The inclusion criteria for participants included in this study were: Patient who are conscious; older than 18 years, able to communicate, speak, listen, read and write; patients who had been diagnosed with heart failure (systolic or diastolic dysfunction) six months ago or more; those with left ventricular ejection fraction $\leq$ 50%, New York Heart Association (NYHA) functional class from I-IV. The exclusion criteria included: Patient who are unconscious or have disturbed level of consciousness, and patient with psychiatric disorders.

2.4 Data collection tools

2.4.1 *Patients' demographic and clinical characteristics assessment tool:*
This tool was designed by the researcher in English after reviewing the related literatures *(Świątoniowska-Lonc etal, 2021; Hassanin et al, 2020)*. It was divided into two parts. Part I included data about patients' demographic characteristics such as age, gender, marital status, educational level, occupation, residence, living condition, monthly income and medical insurance.

Part II included clinical data about patients such as duration of the disease, HF class, ejection fraction, blood pressure, body mass index (BMI), etiology of heart failure, co morbidities, current used drugs, smoking, family history of heart diseases and previous hospitalization.

2.4.2 *The Dutch Heart Failure Knowledge Scale (DHFKS):*
This scale was used to assess patients' knowledge regarding heart failure disease, heart failure treatment, and knowledge on symptoms and symptom recognition. It was adopted from *Van der Wal, et al (2005)*. This scale was designed in an English language. The knowledge scale consisted of 15 multiple-choice question concerning HF in general (4 questions), HF treatment (6 questions on diet, fluid restriction and activity) and symptoms and symptom recognition (5 questions).
Scoring system:
- For each item, patients can choose from three options, with one of the options being the correct answer.
- The correct answer was given one grade and the incorrect answer was given zero.
- The total score of the scale was calculated for every patient, then for all patients.
- The score of this scale was categorized into:
  - Satisfactory level of knowledge ($\geq$ 60% =9 degrees and more).
  - Unsatisfactory level of knowledge (<60% =less than 9 degrees).

2.4.3 Mini-Mental State Examination (MMSE):

The Mini-Mental State Examination (MMSE) tool was used to assess the cognitive impairment in patients with heart failure. It was adopted from *(Folstein et al, 1975)* and was developed in an English language. The MMSE assesses six areas of cognitive ability that includes orientation to time and place (10 questions), registration (3 items), attention and calculation (5 items), immediate and short-term memory (recall) (3 items), language skills (8 items), visuospatial abilities (one item).

Scoring system:
- The scale consisted of 30 items.
- For each item, patients have to answer the question.
- The correct answer was given one degree and the incorrect answer was given zero.
- The total score of the scale was calculated for every patient, then for all patients.
- The score of this scale was categorized into:
  - Normal cognitive level ($\geq 85\%$ =25 degree and more).
  - Abnormal cognitive level (<85% =less than 25 degree).

2.4.4 Patient Health Questionnaire-4 (PHQ-4):

The patient health questionnaire was used to assess symptoms of anxiety and depression among patients with heart failure in the last two weeks. It was adopted from *(Zigmond and Snaith, 1983)* and was designed in an English language. The questionnaire consisted of two items that assess depression and two items that assess anxiety. The response of the patients to these items was on a 4-point Likert scale ranged for 0-3, where (zero) means not at all, (2) means several days, (3) more than half the days, (4) nearly every day.

Scoring system:
- The scale consisted of 4 items.
- The subscale of anxiety includes 2 items.
- The subscale of depression includes 2 items.
- The score for each subscale is a sum of the 2 corresponding items.
- The minimum score in each subscale is 0.
- The maximum score in each subscale is 6.
- Total score ≥ 3 for first two questions suggests anxiety.
- Total score ≥ 3 for last 2 questions suggests depression.
- The total score of the scale was calculated for each patient, then for all patients.
- The score of this questionnaire was categorized into:
  - Normal level of anxiety and depression (0-2).
  - Mild level of anxiety and depression (3-5).
  - Moderate level of anxiety and depression (6-8).
  - Severe level of anxiety and depression (9-12).

2.4.5 *The ENRICHD Social Support Instrument:*

The Enhancing Recovery in Coronary Heart Disease (ENRICHD) Social Support Instrument (ESSI) was used to assess the patients' level of social support in their life. It was adopted from *(Mitchell et al, 2003)*. This instrument was designed in an English language.

Scoring system:

- The instrument consists of 7 statements.
- The first six statements used a 5-point LiKert scale numbered from 1 to 5 with (1=none of the time, 2=a little of the time, 3=some of the time, 4=most of the time, 5=all of the time).
- For each item, patients can choose the number that indicates their response.
- The seventh item is a yes/no question, scored 4 for yes and 2 for no.
- The minimum score is 8.
- The maximum score is 34.
- The total score of the scale was calculated for every patient, then for all patients.
- The score of this instrument was categorized into:
  - Low level of social support (≤18 degree).
  - High level of social support (>18 degree).

2.4.6 *The Kansas City Cardiomyopathy Questionnaire (KCCQ-12):*

The Kansas City Cardiomyopathy Questionnaire (KCCQ) was used to assess the patient's perception about the degree to which their heart failure impacts their health status. It was adopted from *(Green, 2000)* and was designed in an English language. It includes 12 questions that distributed under four domains and ask about the frequency of heart failure symptoms (2-questions), impact on physical limitation (6- questions), and social limitation (one question), and how their heart failure impacts their quality of life (3-questions).

Scoring system:

- The first three questions ask about the physical limitation to perform activity of daily living and used a 6-point Likert scale ranged from 1 to 6 with (1=extremely limited, and 6=limited for other reasons).
- The fourth question ask about frequency of leg swelling and used a 5-point Likert scale ranged from 1 to 5 with (1=every morning, 5=never over the past 2 weeks).
- The 5th and 6th questions ask about frequency of fatigue and shortness of breath and used a 7-point Likert scale from 1 to 7 (1=all of the times, 7= never).
- The 7th question ask about frequency of sleep sitting up and used a 5-point Likert scale from 1 to 5 with (1= every night, 5= never).
- The 8th question ask about limitation in social life and used a 5-point Likert scale from 1 to 5 with (1= extremely limited, 5=not limited).
- The 9th question ask about satisfaction about life and used a 5-point Likert scale ranged from 1 to 5 (1= not at all satisfied, 5=completely satisfied).

- The questions from 10th to 12th ask about lifestyle with heart failure and used a 6-point Likert scale from 1 to 6 with (1= severely limited, 6=does not apply).
- For each item, patients can choose the number that indicates their response.
- The minimum score is zero and the maximum score is 100 degrees.
- The total score of the scale was calculated for every patient, and then for all patients.
- The score of this questionnaire was categorized into:
  - Poor quality of life level (0-24 degree).
  - Fair level of quality of life (25-49 degree).
  - Good quality of life (50-74 degree).
  - Very good level of quality of life (75-100 degree).

2.4.7 *The Self-Care Heart Failure Index (SCHFI):*
The Self-Care Heart Failure Index version 6.2 was used to assess the self care behavior among patients with heart failure. It was adopted from Riegel et al, (2004). This scale is divided into three subscales. The self-care maintenance subscale composed of 10 items measuring behaviors aimed at maintaining physiological stability; self-care management subscale included 6 items related to patients' behavior when symptoms appear and confidence in self-care subscale is consisted of 6 items.
Scoring system:
- The scale consists of 22 items.
- The self care maintenance subscale uses a 4-point Likert scale for responses ranged from 1 to 4 with (1=never, 4= always).
- The self care management subscale; the first item assess how quickly patients identified HF-related symptoms the last time. The patient can select "not applicable" if they didn't have the symptoms. If they had the symptoms they can choose from a 5-point Likert scale ranged from 0 to 4 with (0=didn't recognize symptoms, 4=very quickly).
- The next 4 items of self care management subscale assess the remedies the patients tried to relieve symptoms. It uses a 4-point Likert scale for responses ranged from 1 to 4 with (1=not likely, 4=very likely).
- The last items of this subscale uses a 5-point Likert scale for responses ranged from 0 to 4 with (0=I didn't try anything, 4=very sure).
- The self care confidence subscale uses a 4-point Likert scale for responses ranged from 1 to 4 with (1=not confident, 4= extremely confident).
- For each item, patients can choose the number that indicates their response.
- Following the scoring instructions, scores on each of the SCHFI scales were standardized to 100; higher scores is indicator for higher self-care.
- The minimum score is zero and the maximum score is 100.
- The total score of the scale was calculated for every patient, then for all patients.
- The score of this scale was categorized into:
  - Inadequate self-care level (a score <70 on each subscale and the total scale).

• Adequate self-care level (a score ≥70 on each subscale and the total scale).

2.5 Tools validity and reliability:

The tools were evaluated in terms of face and content validity by a group of five experts (two professors, two assistant professors, and one lecturer) from Faculty of Nursing, medical surgical nursing department at Ain Shams University. The panel reviewed the tools for clarity, relevance, comprehensiveness, simplicity, and applicability. No modifications were done. Testing the reliability of the data collecting tools was done by alpha cronbach test. It was 0.72 for the HF knowledge scale, 0.95 for the MMSE scale, 0.780 for Patient health questionnaire-4, 0.88 for the social support instrument, 0.95 for the KCCQ-12 questionnaire and 0.88 for the SCHFI.

2.6 Pilot study

A pilot study was implemented on 10% (6) of patients with the same selection criteria from the study setting to assess clarity and applicability of the study tools, also to estimate the time needed for each tool. No modifications were carried out in any tool. Patients who participated in the pilot study were involved in the main study subjects.

2.7 Ethical issues

The approval for the research was obtained from the committee of ethical research at faculty of nursing before initiating the study. Permission was also obtained from the director of the medical hospital and director of heart departments before conducting the study. The researcher explained the aim of the study in a letter sent to the hospital's director from the dean of faculty of nursing before the collection of data. Verbal consent was obtained from patients to ensure willingness to engage in the study. The researcher kept anonymity and confidentiality of subjects' data. The investigator informs patients that they are allowed to withdraw from the study at any time without penalty.

2.8 Field work

- The study started by reviewing of the related literatures and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines was done to develop data collection tools.
- The aim and purpose of the study was clarified individually by the researcher to the studied patients prior to data collection, as well as their verbal approval to participate in the study was obtained.
- Data collection continues for about 6 months started from November 2021 until the end of April 2022. The data were collected by the researcher through 3 days/ week (Saturday, Tuesday, Thursday), during the morning and afternoon shifts.
- Patients who fulfilled the selection criteria were interviewed individually by the researcher.

- Demographic characteristics and medical data were collected from the patients' medical records, or from the patients themselves and their family member.

- The data collection tools took about 70 minutes to be completed by the researcher through an individual structured interview with every patient. The heart failure knowledge scale took 15 minutes to completed, the MMSE scale took 15 minutes, patient health questionnaire 5 minutes, the social support instrument 5 minutes, the KCCQ-12 questionnaire 15 minutes, and 15 minutes for the self-care heart failure index.

2.9 Data analysis

The data were collected, coded and entered into a suitable excel sheet. The data were tabulated and statistically analyzed using the statistical package for social science (SPSS) for window, version 20 (SPSS Inc., Chicago, IL). Quantitative data were described as mean and standard deviation and interquartile range to present normally distributed continuous variables. Qualitative data were presented as frequencies (n) and percentage (%). Pearson correlation coefficient (r) was used to correlate between nonparametric quantitative variables. A correlation coefficient greater than zero indicate a positive relationship. While a value less than zero indicates a negative relationship. A value of zero indicates no relationship between the two variables being compared. P-value ≤ 0.05 was considered significant.

3. Results

Table (1) shows that mean age of patients under study was 58± 12.2 years and fall at age group between 26-80 years old. As regard to patients' gender, more than half (55%) of them were males, 51.7% of patients can read and write. In relation to marital status, the table demonstrated that majorities (80%) of patients were married. About residence, it was found that more than half (53.3%) of patients are living in urban area and most of them (91.7%) are living with their families. Approximately two thirds (61.7%) had insufficient income as they reported and (66.7%) did not have medical insurance.

Table (2) reveals that half (50%) of patients were falls at the third degree of heart failure based on the NYHA functional classification and heart failure was due to ischemic causes in most of patients (95%). The results reveals that mean score of disease duration was 33.1 ± 29.5 and ranged from 1-120 months and ejection fraction ranged from 17%-40%. In relation to co morbidities, the results illustrated that most of patients (93%) had co morbidities and all (100%) of them are taking beta-blockers and angiotensin converting enzyme inhibitors and majorities (86.7%) are on diuretics. Moreover, 78.3% of patients had family history of cardiac diseases and 76.7% of them were hospitalized before.

Table (3) represents that 78.3% of patients had unsatisfactory level of knowledge about heart failure with mean score 6±2.9 and one third of them (33.3%) had cognitive impairment.

Table (1): Frequency and percentage distribution of studied patients' demographic characteristics (n=60)

Patients' characteristics	No	%
Age		
Mean ± SD	58 ± 12.2	
(min – max)	26-80	
Median (IQR)	58.5 (50.5-67.5)	
Gender		
Male	33	55.0
Female	27	45.0
Educational level		
Read & write	31	51.7
Secondary education	22	36.7
High education	7	11.6
Marital status		
Married	48	80.0
Widow	9	15.0
Divorced	2	3.3
Single	1	1.7
Occupation		
Employed	18	30.0
Unemployed	0	0.0
Retired	17	28.3
Housewife	25	41.7
Residence		
Urban	32	53.3
Rural	28	46.7
Living alone		
Yes	5	8.3
No	55	91.7
Income		
Sufficient	23	38.3
Insufficient	37	61.7
Medical insurance		
Yes	20	33.3
No	40	66.7

Table 2. Frequency and percentage distribution of studied patients' clinical data (n= 60)

Patients' characteristics	No	%
Heart failure class		
Class II	16	26.7
Class III	30	50.0
Class IV	14	23.3
Heart failure etiology		
Ischemic	57	95.0
Non ischemic	3	5.0
Heart failure duration (in months)		
Mean ± SD (min-max)	33.1 ± 29.5	1-120
Ejection fraction %		
Mean ± SD (min-max)	31.9 ± 6.3	17-40
Systolic blood pressure		
Mean ± SD (min-max)	112.7 ± 15	80-165
Diastolic blood pressure		
Mean ± SD (min-max)	71.7 ± 10.1	50-90
Smoking		
Yes	14	23.3
No	46	76.7
Body mass index		
Mean ± SD (min-max)	30.4 ± 7.7	19-55
Co-morbidities		
Yes	56	93.3
No	4	6.7
Beta-blockers & *ACEi		
Yes	60	100.0
No	0	0.0
Diuretics		
Yes	52	86.7
No	8	13.3
Family history		
Yes	47	78.3
No	13	21.7
Previous hospitalization		
Yes	46	76.7
No	14	23.3

*ACEi mean Angiotesin converting enzyme inhibitors.

Table 3. Frequency and percentage distribution of the studied patients' knowledge and cognitive impairment level (n=60)

Items	No	%
Patients' knowledge regarding heart failure		
Unsatisfactory	47	78.3
Satisfactory	13	21.7
Mean ± SD (min-max)	6 ± 2.9	1-14
*Cognitive function using MMSE		
Normal	40	66.7
Abnormal	20	33.3
Mean ± SD (min-max)	24.4 ± 5.8	10-30

*Mini mental State Examination Scale

Table (4) demonstrated that 40% of patients under study had moderate level of anxiety and depression and nearly one fifth (18.3%) had severe level with mean score 5.8 ± 2.7. Concerning the social support level, it was revealed that 80% of patients had high social support level with mean score 26.9 ± 5.7.

Table (5) illustrated that 70% of patients under study have fair level of quality of life, and approximately all of them (96.7%) have inadequate self care level.

Table (6) showed the positive correlation between patients' self care maintenance, management, confidence and total self care and their level of knowledge where p value <0.05. In addition, the findings illustrated the positive correlation between patients' self care maintenance, management and total self care and their cognitive ability where p value was 0.002, 0.009, and 0.003 respectively.

Table 4. Frequency and percentage distribution of the studied patients regarding anxiety, depression and social support level (n=60)

Items	No	%
Anxiety and depression scale level		
Normal	9	15.0
Mild	16	26.7
Moderate	24	40.0
Severe	11	18.3
Mean ± SD (min-max)	5.8 ± 2.7	1-11
Social support level		
Low	12	20.0
High	48	80.0
Mean ± SD (min-max)	26.9 ± 5.7	9-33

Table 5. Frequency and percentage distribution of the studied patients as regard to quality of life and self care (n=60)

Items	No	%
Quality of life level		
Poor	5	8.3
Fair	42	70.0
Good	13	21.7
Very good	0	0.0
Mean ± SD (min-max)	28.8 ± 9.6	14-51
Total self care level		
Not adequate	58	96.7
Adequate	2	3.3
Mean ± SD (min-max)	43.8 ± 7.5	27-65

Table (6): Correlation between self-care of the studied patients and their knowledge and cognitive ability (n=60)

Items	Test	Heart failure knowledge	Cognitive impairment
Self-care maintenance	r	0.380	0.398
	P	0.003*	0.002*
Self-care management	r	0.399	0.334
	P	0.002*	0.009*
Self-care Confidence	r	0.418	0.202
	P	0.001*	0.121
Total SCHF	r	0.463	0.379
	P	0.000*	0.003*

P value> 0.05 not significant   *statistically significant P value ≤0.05

Table (7) showed the negative correlation between all parameters of patients' self care and their level of anxiety and depression with statistically significant only with self care maintenance where p value =0.027. Concerning the social support, the findings illustrated there was no correlation between patients' self care and the level of social support where p value was > 0.05. As regard to quality of life, the results revealed the positive correlation between patients' self care maintenance, confidence and quality of life of patients included in the study where p value 0.014 and 0.026 respectively.

Table (7): Correlation between self-care of the studied patients and their anxiety and depression, social support and quality of life (n=60)

Items	Test	Anxiety and depression	Social support	Quality of life
Self-care maintenance	r	- 0.285	0.082	0.316
	P	0.027*	0.534	0.014*
Self-care management	r	-0.053	0.073	0.006
	P	0.687	0.578	0.962
Self-care confidence	r	-0.126	0.083	0.287
	P	0.338	0.530	0.026*
Total SCHF	r	-0.198	0.093	0.249
	P	0.129	0.481	0.055

P value> 0.05 not significant   *statistically significant P value ≤0.05

4. Discussion:

Heart failure is a public and increasing health problem worldwide. It is a chronic disease that is associated with different positive or negative outcomes according to the patient's ability to perform self-care. Self-care is considered an effective method for managing HF and is associated with several positive outcomes for patients, including enhanced quality of life, decreased mortality, fewer re-admissions, and reduced health care costs. It is important for health care provider to assess factors that may affect the patient's involvement in self-care activities and result in poor outcomes, deterioration of patients' conditions and early death (Vellone et al., 2020).

According to the findings of the current study, the mean age of the study subjects was 58 ± 12.2 years, with more than half of them being males. More than half of the patients had low education level; three quarters of them had class III and IV heart failure and most of them were due to ischemic causes with ejection fraction being 31.9±6.3. Moreover, the duration of heart failure mean score was 33.1±29.5 and all of patients were maintained on beta-blockers, ACEi and diuretics.

These results are in accordance with *Kim et al, (2019)* who found that the final subjects consisted of 117 patients, (age 65.5 ± 9.4 years; men 58.1%; education 10.0 ± 4.0 years (<high school graduation); left ventricular ejection fraction 35.0 ± 8.7%). The majority of patients had no or mild functional limitations imposed by HF (NYHA class I/II 74.4%). Approximately one-third had ischemic etiologies (35.0%). Most of patients were stable with medications, including ACEi (49.6%), beta-blockers (61.5%) or diuretics (53.0%).

The results of the present study reported that more than three-quarters of patients had an unsatisfactory level of knowledge about heart failure, with a mean score of 6 ± 2.9. This may be due to the fact that most people in this study received low educational levels (only read and write or secondary education), they usually don't care to know more about their diseases, or it may be because they didn't find the chance to be educated and aware of their diseases from trustworthy and professional persons like the health care team. This finding is in agreement with *Róin et al. (2019)*, who stated that the mean knowledge score at baseline was 9.9 (2.5), which improved to 12.6 (1.5) at 3 months with a *p* value of <0.001 in their study that assessed the knowledge of patients about heart failure. They attribute the low level of knowledge to the respondents' educational level and whether they had received high-quality education.

In this study, one third of patients had cognitive impairment in one or more domains of the cognitive scale, which may be attributed to the fact that most of the patients had class III and IV heart failure, which is characterized by low ejection fraction and subsequently low cardiac output to the brain tissue, which affect the cognitive ability of patients to recognize time and place, remember and recall information, and in attention and calculation. In addition, the cognitive impairment in this study may be due to the long period of the disease among patients that ranged from one to 120 months or due to the age of participants and the ischemic cause of heart failure that impaired the blood flow to the brain. This finding is supported by *Kim et al. (2019)*, who stated that approximately 10% of the patients with global cognition and one-third of the patients with HF had cognitive impairments in most of the domains.

One of the observed findings of this study is the positive correlation between the total cognitive impairment of patients and their total self-care behaviors. This could explain the inadequate self-care maintenance, management, and confidence among most of the patients under study. It is known that cognitive impairment in heart failure patients could affect their involvement in the management plan for their disease. This result comes in line with Hjelm et al. (2015), who reported that decreased cognitive function often accompanies poor self-care behavior, which affects most of patients with HF with poor self-care adequacy of 56–100% in core self-care elements of maintenance and management and, in turn, impacts their quality of life.

The current study demonstrated the negative correlation between anxiety and all domains of self-care. Higher levels of anxiety and depression are associated with a lack of self-care. This may be due to the fact that heart failure is a chronic disease that has a negative impact on patients and their families. Depression and anxiety is common psychological sequel of heart failure. A chronic disease causes the patient to be distressed by various symptoms, to be dependent on others, and to fear of death and financial instability due to the high cost of treatment and medication, the lack of medical insurance,

and the necessity of adhering to specific instructions of lifestyle. All these factors contributed to the high and moderate anxiety and depression levels, which impact self-care among the patients under study. This result is agree with *Freedland et al. (2021)*, who clarified that higher PHQ-9 depression scores were independently associated with lower scores on the SCHFI maintenance (P <0.05), management (P <0.01), and confidence (P <0.01) scales.

With regard to the social support level, it was revealed that the majority of patients under study had a high social support level. This could be attributed to the role that family members are playing in the support of their patient, and it reflects the normal culture of Egyptian people, who are usually supportive and helpful and show enthusiasm at times of worsening social circumstances and try to help their patient return to his normal life because of the fear of his death. In addition that majority of patients in the study were married which help patients to receive high social support. This result is agree with Ahmad Ainuddin et al, (2019) who stated that family support has the highest mean score when compared to other sources of support. As 90% of the participants are married, this is evident that individuals who stay together with their family received greater support.

Although the patients in this study obtained high levels of social support from their families, there was no correlation between the social support and self-care behavior. This could be due to patients' reliance on their families to provide all of their care, such as assisting them in adhering to the prescribed treatment, following a sodium-restricted diet, and limiting the amount of fluid to the daily allowance in order to avoid another hospitalization or worsening of their condition. This may lead to the patient taking a negative attitude toward himself, or they may believe that a self-care regimen is complex, time-consuming, burdensome, and difficult to implement. This finding is at odds with the findings of Ahmad Ainuddin et al. (2019), who found that social support from a spouse has a significant impact on heart failure patients' self-care and wellbeing, and that this support included practical assistance, informational assistance, emotional assistance, social interaction, and attention to symptoms.

The results of the current study demonstrated the positive correlation between self care maintenance and confidence and the quality of life of patients with heart failure. The ability of patients to maintain self care through some activities such as checking ankle for swelling frequently, avoid getting sick sometimes, doing physical activity sometimes, maintaining doctor or nurse appointment frequently, eat low salt diet daily, and frequently remember to take their medicine are linked to fair quality of life of patient under study.
This result is contradicted with Asadi et al, (2019) who found no correlation between self-care behaviors and quality of life and attributed that to the Iranian cultures and perspectives such as valuing live with the children and importance of their attention to elderly patients. In addition, Wisnicka et al, (2022) added that men with HF have

unsatisfactory self-care outcomes and low quality of life scores and are dissatisfied with their health.

The present study demonstrated that most of patients had inadequate self-care behaviors   toward their disease which may be due to lack of knowledge and awareness about self care activities and disease management, presence of anxiety and depression, cognitive impairment of patients, relying on others, long duration of the disease. In addition to, functional limitation resulted from heart failure class III and IV, low educational level of patients under study, age of patients, insufficient income and lack of medical insurance.

5. Conclusion:

- The current study answer the first research question and concluded that more than three quarters of patients with heart failure had unsatisfactory level of knowledge, one third have cognitive impairment, two fifths suffered from moderate level of anxiety and depression, majorities of them got high social support from their families or friend, nearly three quarters had fair quality of life, and most of them had inadequate self care behaviors toward heart failure.
- The results also answer the second question of the research and illustrated a positive correlation between the self-care behaviors and knowledge, cognitive impairment, and quality of life of patients under the study. While there was negative correlation between the self-care behaviors and anxiety and depression. Moreover, no correlation wad detected between the social support level and self care of patients with heart failure.

6. Recommendations:

- Ongoing assessment of factors that may impedes self care behaviors among patients with heart failure can help health care professionals in providing disease management based on individual needs.

- Developing an educational material or awareness sessions that help patients with heart failure to overcome and modify the barriers/factors that prevent them from participation in self-care activities.

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الملخص العربى

العلاقة بين العوامل متعددة الأبعاد و سلوكيات الرعاية الذاتية لدى مرضى قصور عضلة القلب

الخلفية: قصور القلب هو مرض مزمن تقدمي يرتبط بمعدلات أمراض كبيرة ووفيات وتكلفة عالية للرعاية الصحية. أوضحت أنشطة الرعاية الذاتية أنها تعمل على تحسين جودة الرعاية لقصور عضلة القلب ونتائج المرض. **الهدف:** هدفت هذه الدراسة إلى تقييم العلاقة بين العوامل متعددة الأبعاد (المعرفة ، ضعف الإدراك ، القلق والاكتئاب ، الدعم الاجتماعي ، جودة الحياة) وسلوكيات الرعاية الذاتية لدى مرضى قصور عضلة القلب. **تصميم الدراسة:** تم إستخدام التصميم البحثى الوصفي ذو العلاقة لتحقيق هدف هذه الدراسة. **مكان الدراسة:** أجريت هذه الدراسة في قسم القلب بمستشفى جامعة عين شمس. **العينة:** تم اختيار عينة غرضية مكونة من (60) مريضاً بالغاً يعانون من قصور في القلب لتضمينها في هذه الدراسة. **أدوات جمع البيانات:** (1) أداة تقييم الخصائص الديموغرافية والسريرية للمرضى. (2) المقياس الهولندي للمعرفة عن قصور القلب. (3) مقياس فحص الحالة العقلية المصغر. (4) استبيان صحة المريض. (5) أداة تقييم الدعم الاجتماعي. (6) استبيان اعتلال عضلة القلب في مدينة كانساس. (7) مؤشر قصور القلب للرعاية الذاتية. **النتائج:** أظهرت هذه الدراسة أن 78.3٪ من مرضى قصور القلب لديهم مستوى غير مرضي من المعرفة ، و 33.3٪ يعانون من ضعف إدراكي ، و 40٪ يعانون من مستوى معتدل من القلق والاكتئاب ، و 80٪ حصلوا على دعم اجتماعي مرتفع من عائلاتهم ، و 70٪ لديهم جودة عادلة للحياة. بالإضافة إلى ذلك ، تم توضيح وجود علاقة ارتباط بين سلوكيات الرعاية الذاتية والمعرفة ، والضعف الإدراكي ، والقلق والاكتئاب ، والدعم الاجتماعي ، ونوعية الحياة بين مرضى قصور القلب حيث قيمة p> 0.05. **الخلاصة:** هناك عدة عوامل ترتبط إيجابًا / سلبًا بسلوكيات الرعاية الذاتية لدى مرضى قصور القلب مثل معرفة المرضى ، والضعف الإدراكي ، والقلق والاكتئاب ، ومستوى الدعم الاجتماعي ، ونوعية الحياة. **التوصيات:** التقييم المستمر للعوامل التي قد تعيق سلوكيات الرعاية الذاتية بين مرضى قصور القلب يمكن أن يساعد أخصائيي الرعاية الصحية في توفير إدارة المرض بناءً على الاحتياجات الفردية.