Effect of Self-Care Guidelines on the Knowledge, Practice and Clinical Outcomes of Patients with Chronic Heart Failure Disease

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Abstract: **Background: Self-care guidelines for patients with chronic heart failure disease (CHFD) is considered as a strategy for promoting their knowledge, practice and clinical outcomes. Aim: this study aimed to evaluate the effect of self-care guidelines on knowledge, practice and clinical outcomes of patients with CHFD through the following: 1) assessment of knowledge, practice and clinical outcomes of patients with CHFD. 2) developing and implementing self-care guidelines. 3) evaluating the effect of self-care guidelines on knowledge, practice and clinical outcomes of patients with CHFD. Study design: a quasi- experimental design was utilized to conduct this study. Setting: the study was conducted at cardiac outpatients' clinics at Ain Shams university hospitals. Subject: a purposive sample of 60 patients with chronic heart failure disease were select. Data collection tools: 1) patients' assessment tool 2) patient's knowledge assessment tool regarding CHFD 3) patients' practice observational checklists and 4) patients' clinical outcomes assessment tool. Results: there were significant improvement in the studied patients' knowledge, practice and clinical outcomes post guideline implementation compared to pre. Conclusion: application of self-care guidelines for patients with CHFD has positive effect on improving knowledge, practice and clinical outcomes regarding dyspnea, sleep quality, fatigue and mood. Recommendations: Further researches are recommended periodically to be carrying out on new approaches in the area of management of patients with CHFD and evaluate its effect on patients' outcomes. Replication of the current study on a larger probability sample is recommended to achieve generalization of the results and wider utilization of the designed program. Establish interdisciplinary approach in management of CHFD.**

Keywords: **Self- card, clinical outcomes, chronic heart failure.**

1. INTRODUCTION

Chronic heart failure disease (CHFD) is not a disease, it is a syndrome caused by and associated with numerous type of heart disease, particularly with long standing hypertension and coronary artery disease. Also it is a long term illness, often associated with disability and characterized by left ventricular dysfunction, reduces exercises tolerance, diminished quality of life and shortened life expectancy *(Luniewski et al., 2018).*

Chronic heart failure disease (CHFD) has been a major public health problem and will remain a challenge for clinicians within the twenty-first century. Worldwide, CHFD is in the spotlight because of its high prevalence, morbidity and mortality. The burden of the disease is great both for those directly affected and for society *(Deverly et al., 2019).*

Recognition and treatment of problems are priorities of care for patients with chronic illness such as heart failure, which help them to become more involved in their own care through using self-care to care for themselves aiming at management of these problems and help patients to have a higher quality of life, reduce the number of hospitalizations and visits to his/her physician *(Kannel and Belanger, 2021)*.

Based on the previous researches, it was noted that CHFD patients and their family members whose not know as much as possible about the problems and it's management were liable to unsatisfactory outcome. It was emphasized on the patients' morbidity and mortality and on increasing the cost of medications, laboratory tests and cost of the care providers. Also, another studies reported that the patients who adhere to their self-care had better outcomes, live longer, enjoy a higher quality of life and suffer fewer symptoms and complications *(Baker et al., 2017)*.

When patients know self-care that they used them for managing their problems is consider as a broad the therapeutic modality, its primary goal is to restore the patient to the highest possible level of independent function, rather than focusing slowly in reversing the disease process, in an attempt to improve disability from disease and the quality of life *(Abd- El Atief, 2019)*.

Successful determine self-care for managing their problems can help patients to become better educated and more involved in their own care through using self-care to care for themselves aiming at recovery from illness and management of chronic illness. This self-care also help patients to have a higher quality of life, reduce the number of hospitalizations and visits to their physicians and have fewer psychosocial problems related to inactivity and a feeling of hopelessness *(Abdel-Salam, 2016)*.

Self-care is the most common and fundamental form of health care. It is often of greater importance than professional health services and has been found to be an important determinant of health outcomes. Yet, there is little research about CHFD patients' management *(Androas, 2019)*.

Significance of the study:

Currently about 5 million people in the united states have CHF. It is the most rapidly increasing form of cardiovascular disease. *(American heart association (AHA), 2021)* estimates that 470.000 new cases are diagnosed each year. CHF dramatically increase with advancing age and as the elderly population increase, CHf incidence and prevalence will increase. Approximately 1 in every 100 older adults has CHF. It is the most common reason for hospital admission in adults older than 65 years.

The incidence of heart failure is similar in men and women. Heart failure is associated with high rates of morbidity, mortality and economic costs. Despite new advances in treatment, the number of deaths due to CHF has increased six fold during the past 4 years. The annual health care cost of managing patients with CHF exceeds $57 billion *(American Heart Association, 2021)*.

In Egypt, the center of statistics of Ain Shams university hospital 2021 reported that the total number of CHFD patients for year 2021 were around 786 patients *(Medical statistical report of Ain Shams University Hospital)*.

These findings necessitate the researcher for the importance of conducting this study to design and implement guidelines for such group of patients and evaluate its effectiveness on clinical outcomes.

Aim of this study

This study aims to evaluate the effect of self-care guidelines on knowledge, practice and clinical outcomes of patients with chronic heart failure disease (CHFD) through the following:

1- Assessing patients' knowledge and practice regarding chronic heart failure.

2- Assessing clinical outcomes of patients with chronic heart failure.

3- Developing and implementing self-care guidelines.

4- Evaluating the effect of self-care guidelines on knowledge, practice and clinical outcomes of patients with chronic heart failure.

Research Hypothesis:

The current study hypothesized that:

The implementation of self-care guidelines will affect positively the knowledge, practice and clinical outcomes of patients with chronic heart failure.

2. SUBJECTS AND METHODS

The present study was portrayed under the four main designs as the following:

I.   Technical design

II. Operational design

III. Administrative design

IV. Statistical design

I) Technical design:

The technical design for this study included research design, setting, subjects, and tools used for data collection.

Research design:

This study was conducted through using a quasi-experimental design to achieve the aim of the study. Quasi-experimental design is an empirical interventional study used to estimate the causal impact of an intervention on target population without random assignment *(Hosley and Jones, 2019).*

Setting:

The study was conducted at cardiac outpatients' clinics at Ain Shams University Hospitals.

Subjects:

The study included a purposive sample of 60 adult patients with chronic heart failure disease.

Inclusion criteria:

The patients were selected according to certain inclusion criteria as follow: Patients with mild or moderate chronic heart failure disease, adult patients, their ages ranged from 40 to 55 years old, from both genders, having different educational levels.

Exclusion criteria:

Patients who had any other chronic diseases or disability.

Tools for Data Collection:

Four tools were used in this study as the:

I- Patients' assessment tool (Appendix I):

This tool was developed by the researcher in Arabic language. It includes the following two parts:

The 1ˢᵗ part: Concerned with the socio-demographic characteristics of the patients with chronic heart failure disease as regards patients' age, gender, marital status, level of education, occupation, income, living condition, number of family members, home ventilation and housing location.

The 2ⁿᵈ part: Concerned with the medical health profile of the patients with CHFD as regards:

• Present history which included duration of illness, factors underlying disease, symptoms that the patients complain of them as regards physiological symptoms for all body systems (respiratory, cardiovascular, nervous, sleep, movement and activity, gastro-intestinal tract and excretion systems), symptoms associated with sexual activity, psychological symptoms (anxiety, depression and fear).

• Past, family and Smoking history.

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II- Patients' knowledge assessment tool

It was developed by the researcher based on recent literature review *[Androas (2019); Beatty and College (2019); Bennett et al. (2019)]* it was used to assess patients' knowledge regarding CHFD. It was prepared by the researcher in simple Arabic language. It was filled by the researcher.

This tool was divided into three parts as the following:

The 1st part: Concerned with the assessment of patients' knowledge regarding anatomy and physiology of the heart. It is composed of 8 multiple choice questions.

The 2nd part: Concerned with the assessment of patients' knowledge regarding CHFD. It is composed of 56 true or false questions distributed as the following: 3 definition, 6 causes, 5 risk factors, 18 manifestations, 11 diagnosis, 6 management and 7 complications.

The 3rd part: concerned with the assessment of patients' knowledge regarding self-care. It is composed of 185 true or false, yes or no questions.

Scoring system:

The total score of patients' knowledge was 249 marks, each correct answer was given 1 mark and each incorrect answer was given 0.

Total score was considered as follows:

- $\geq 60\% = \geq 149$ correct answers were considered satisfactory level of knowledge.

- $< 60\% = < 149$ correct answers were considered unsatisfactory level of knowledge.

III-Patients' practice (Observational Checklist):

It was developed by the researcher based on recent literature review *[Khan (2019); Hagberg et al. (2019); Sullivan and Hawthorne (2019)].* To assess patients' ability to perform skills. The response of each procedure was divided into (done, not done). The observation checklist was composed of 4 skills including deep breathing exercise, relaxation exercises, range of motion exercise and pulse measuring.

Scoring system:

The total marks of patients practice observation checklists was 57 marks. 1 mark was given to the step which was done and 0 to the step which was not done or incorrectly done. It was distributed to 4 procedures. The marks were distributed as follows: 5 deep breathing exercise, 8 relaxation exercise, 39 range of motion exercise and 5 pulse measuring.

The total score was considered as the following:

- $\geq 60\% = \geq 34$ correct answers were considered satisfactory level of practice.

- $< 60\% = < 34$ correct answers were considered unsatisfactory level of practice.

IV-Patient's clinical outcomes assessment tools:

It was used for assessing the patients' clinical outcome regarding dyspnea, sleep, fatigue and mood.

This tool covered the following four parts:

The 1st part: Medical research council dyspnea scale (MRCDS):

This scale was adopted from *Fletcher (2013)* to assess the level of activity that produce dyspnea for patients. This tool was translated into Arabic. Assurance of its accuracy was fulfilled through its back translation into English via English translator.

Scoring system:

• The MRCDS is a five point scale grading the severity of dyspnea associated with activities of daily living. It ranges from grade 0 to 4.

• Grade "0" means patient wasn't troubled with breathlessness.

- Grade "1" (mild) means patient troubled by shortness of breath when hurrying on the level or walking up a slight hill.

- Grade "2" (moderate) means patient walks slower than people of the same age on the level because of breathlessness or has to stop for breath when walking at own pace on the level.

- Grade "3" (severe) means patient stops for breath after walking a short distance or after a few minutes on the level.

- Grade "4" (very severe) means patient is too breathless to leave the house or breathless when dressing or undressing. Patients were asked to decide on the level of activity that produces dyspnea.

Number and percentage of patients in every level were calculated pre and post self-care guidelines implementation.

The 2rd part: Pittsburgh sleep quality index (PSQI):

This scale was adopted from ***Buysse et al. (1989)*** to assess the severity of sleep- onset and sleep maintenance difficulties. This tool was translated into Arabic language, then retranslate into English to assure its accuracy.

Scoring system:

The scale included 15 items. Items (1 to 4) were open question, items (5 to 15) had 4 responses.

In scoring the PSQI, 11 component scores are derived, each scored 0 (no difficulty) to 3 (severe difficulty). The component scores are summed to produce a global score (range 0 to 33). Higher scores indicate worse sleep quality.

The mean and standard deviation for all patients' scores were calculated pre and post self-care guidelines implementation.

The 3nd part: Functional assessment fatigue scale:

This scale was adapted from ***Lou (2016)*** and modified by the researcher based on recent literature review ***[Williams et al. (2017); Ream and Richardson (2018); Small and Lamb (2018)].*** It included 21 items to assess patients' fatigue experience and its effect on physical state 8 items, perceptual 8 items, social 3 items and sexual well-being 2 items pre and post self-care guidelines implementation. This tool was translated into simple Arabic language by the researcher. Assurance of its accuracy was fulfilled through its back translation into English via English translator.

Scoring system:

The functional assessment fatigue scale included 4 scales ranged from 1 grade (always) = poor, 2 grade (sometimes) = average, 3 grade (rarely) = good.

The total for the functional assessment fatigue scale was calculated as a following:

- Poor functional assessment fatigue scale $0 \leq 50\%$.

- Average functional assessment fatigue scale $50 < 75\%$.

- Good functional assessment fatigue scale 75% and more.

The 4th part: short form of the profile of mood states (POMS):

POMS-SF is an adaptation to the original 65 items POMS. This scale was adopted from ***Shelly, Michael& Jamie (1995).*** To assess feelings people had within the last week including the day in which the data were collected. This tool was translated into simple Arabic language by the researcher, then retranslated into English to assure its accuracy. The POMS-SF consists of 26 items which describe mood on a 5 point Likert scale (0= not at all, 1= a little, 2= moderately, 3= quite a bit, 4= extremely). Respondents rate six mood subscales, including: depression, anger, tension, confusion, fatigue and vigor. Depression had 7 items (6, 8, 9, 13, 19, 22, 25), anger had 4 items (2, 5, 12, 16), tension- anxiety had 4 items (1, 10, 14, 18), confusion had 4 items (4, 20, 23, 24), fatigue had 2 items (11, 17) and vigor had 5 items (3, 7, 15, 21, 26).

Scoring system:

The patients' scores for every subscale were calculated:

- Depression   (0- 28).

- Anger   (0- 16).

- Tension   (0- 16).

- Confusion   (0- 16).

- Fatigue   (0-8).

- Vigor   (0-20).

The total score of mood disturbance scale 84 was done by adding scores for depression, anger, tension, confusion and fatigue and then subtracting vigor score. Higher scores indicate worse mood state.

Mean and standard deviation for all patients' scores were done pre and post self-care guidelines implementation.

II. Operational design:

The operational design included preparatory phase, validity and reliability, pilot study and fieldwork.

Preparatory phase:

It included reviewing of the current and most recent national and international related literature and theoretical knowledge of various aspects of the study using books, articles, periodicals, magazines and internet to develop tools for data collection and patients' guidelines.

Tools' validity and reliability:

Validity of the developed tools was tested through a jury of 7 experts from medical surgical nursing department, Ain Shams University (2 professors, 3 assistant professors and 2 lectures). The experts reviewed the tools for clarity, relevance, comprehensiveness and simplicity; minor modifications were done.

Reliability test of the developed tools was done statistically by alpha Cronbach test. Alpha Cronbach for patients' knowledge assessment tool was (22.381), for patients' self-care practice observational checklist was (31.393) and for patients' functional assessment fatigue scale was (28.556), those values indicated moderate to high reliability of the used tools.

Pilot study:

A pilot study was carried out on 10% of total study subjects of patients to test the applicability of the study and to test clarity of the designed tools, as well as to estimate the time needed to conduct the study. The study subjects who included in the pilot study were included in the main study group because, there aren't modifications on the tools were done after the pilot study.

Field work:

Field work included four phases: assessment, planning, implementation and evaluation phases.

A- Assessment phase:

The data collection during this phase took about 15 weeks (4 months) during the period from May 2020 to August 2020. It carried out through the following sequence:

A purposed sample of 60 patients with CHFD who fulfilled the inclusion criteria were selected, the researcher obtained the patients' oral consent for participating in this study after explaining the aim of the study prior to data collection.

The patients' assessment tool were used to assess patients' socio-demographic and medical profile health, it had taken about 20 minutes (Tool I). Patients' knowledge assessment tool were used to assess patients' knowledge regarding CHFD (Tool II), this tool was filled in by the researcher, it had taken about 45- 60 minutes to be filled in according to patient's condition.

Patients were observed by the researcher using observational checklists to assess their practice (Tool III). It had taken 20 minutes for every patient. The clinical outcomes assessment tools were filled in by the researcher (tool IV). It had taken 30 minutes for every patient.

The researcher collected the data from the patients two days per week (Monday & Thursday) in which the data were collected from two patients each day.

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B- Planning Phase:

This phase took about 8 weeks (2 months) it carried out through the following sequence:

All information gathered through data collection tools was interpreted to identify the individualized learning needs.

The researcher designed and developed a booklet in Arabic language in the light of related literature *[Abd El Halim (2015); Diller et al. (2015); Dunbar et al. (2015); Carrieri et al. (2016); Backman and Hentinen (2017)]* based on patients' needs at the assessment phase and then reviewed by a jury of 7 experts in the medical-surgical nursing department in the faculty of nursing, at Ain Shams University to assess content validity. Based on the opinion of the experts, some modifications were done and then the final form was developed.

A plan for guidelines sessions was developed to guide the researcher in the implementation and evaluation its effectiveness on the patients' knowledge, practices and clinical outcomes.

The researcher set up a teaching session plan covering all objectives. These objectives were categorized into general and specific objectives.

The researcher determined the timetable of sessions, teaching strategies, (methods and media) and learners' activities.

The resources and facilities for applying guidelines were allocated printed material (booklet was handed out), power point, presentation videos and location of sessions that best serve the learners.

The appointment for starting teaching sessions was determined and scheduled with the patients (Monday & Thursday weekly). Started at the beginning of September 2020 to the end of October 2020.

C- Implementation phase:

The data collection during this phase took about 12 weeks (3 months). It carried out through the following sequence:

The teaching sessions were conducted in a classroom at cardiac outpatients' clinics at Ain Shams University Hospitals. The classroom was conditioned, quite, had adequate lighting, well ventilated and furnished, had adequate spacing for implementing guidelines sessions.

The teaching sessions were conducted by the researcher for all patients based on their needs' assessment. Total number of guidelines sessions were eight sessions (6 sessions for theoretical and 2 sessions for practical) for covering its content. The duration of each session is 45 seconds (4.5 hours for theoretical and 1.5 hours for practical sessions).

Each session of guidelines was conducted 2 times (2 groups)/ day over 2 days/ week (Monday & Thursday). These sessions were conducted for small group; each group number didn't exceed 10 patients, so 20 patients received the eight self-care guidelines sessions in 4 weeks (one month for every 20 patients) the same manner followed by the researcher for the six groups of patients for covering total number of patients (n= 60) so self-care guidelines implementation phase took 12 weeks (3 months). Started at the beginning of November 2020 to the end of January 2021.

At the beginning of each session an orientation about the importance, proceeding the content of guidelines was explained to the patients by using simple words to suit the educational level of the patients and using proper tone of voice that showed interest, concern and friendly manner to motivate them to follow these guidelines. The teaching methods were lectures, small group discussion, role play and demonstration supported by using posters and teaching on spot. Teaching session were conducted for every group of patients (10 patients). The booklet was handed out for every patient.

Patients were allowed to ask questions in case of miss-understanding while listening and expressing interest for them. Getting feedback about what was explaining and given through the session was done.

At the end of these sessions, the researcher informed patients that they will be evaluated by the researcher after three months from sessions.

D- Evaluation phase:

The data collection during this phase took about 15 weeks (4 months). Started at the beginning of February 2021 to the end of May 2021. It carried out through the following sequence:

Post implementation of guidelines, the patients' knowledge, practice and clinical outcomes was assessed by the researcher using the previous mentioned tools (II, III, IV) in the same manner as stated in the assessment phase after 3 months of the guidelines implementation.

Evaluating the effect of self-car guidelines implementation on patients' knowledge, practice and clinical outcomes was done by comparing the related results pre and post the implementation of the guidelines.

Data collection for the subjects of this study took 52 weeks (about 13 months) started at the beginning of May 2020 to the end of May 2021.

III.Administrative Design:

An official letter was issued from the faculty of nursing, Ain Shams University to the director of cardiac outpatients' clinics at which the study was conducted, explaining the purpose of the study to obtain their permission to conduct this study.

Ethical considerations:

The ethical research considerations in the study included the following:

- The research approval was obtained from the ethical committee of faculty of nursing before initiating the study work.

- The researcher clarified the objectives and aim of the study to patients included in the study.

- Oral consent was obtained from patients to participate in the study.

- The researcher assured maintaining anonymity and confidentiality of subjects' data.

- Patients were informed that they are allowed to withdraw from the study at any time.

IV.Statistical Design:

Recorded data were analyzed using the statistical package for social sciences, version 23.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD) Chi-square test, Pearson's correlation coefficient (r) test and Paired sample t-test. Qualitative data were expressed as frequency and percentage.

The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:

– P-value <0.05 was considered significant.

– P-value <0.001 was considered as highly significant.

– P-value >0.05 was considered insignificant.

3. RESULTS

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

Items	Patients	
	N	**%**
Age (years)		
40-<45	12	20.0
45-<50	32	53.3
50-55	16	26.7
Mean ±SD	47.83±8.13	
Gender		
Male	46	76.7
Female	14	23.3
Marital status		
Married	53	88.3
Unmarried	7	11.7

Educational level		
Illiterate	10	16.7
Read & write	42	70.0
Diploma education	8	13.3
University education	0	0.0
Occupation		
Office work	0	0.0
Literal work	39	65.0
Unemployed	21	35.0
Income according to patient's opinion		
Enough	0	0.0
Not enough	60	100.0
Living condition		
Alone	0	0.0
With family	60	100.0
Number of family members		
< 5	23	38.3
≥ 5	37	61.7
Home ventilation		
Enough	22	36.7
Not enough	38	63.3
Housing location		
Far from health care setting	60	100.0
Near from health care setting	0	0.0

Table (1) clarifies that, 53.3% of the studied patients belong to age group between $45 \leq 50$ years old with mean age 47.83 ± 8.13 years, 76.7% of the studied patients were male, 88.3% of the studied patients were married, 70.0 of the studied patients were able to read and write, 65.0% of the studied patients have literal work, 100.0% of the studied patients hadn't enough income and living with their family, in addition, 61.7% of the studied patients were living with more than five members, 63.3% of the studied patients were living in badly ventilated houses and 100.0% of the studied patients living away from their health care setting.

Table (2): Frequency and percentage distribution of the studied patients' total knowledge regarding CHFD pre and post guidelines implementation. (n=60).

Items	Satisfactory level of knowledge				Chi-square	
	Pre		Post			
	N	%	N	%	X^2	P-value
Anatomy and physiology of the heart	0	0.0	57	95.0	104.795	<0.001**
Heart failure disease	22	36.7	49	81.7	23.323	<0.001**
Safe use of Medications	19	31.7	47	78.3	26.103	<0.001**
Smoking cessation (n= 31)	11	35.5	27	87.1	33.390	<0.001**
Nutrition	22	35.0	40	66.7	56.082	<0.001**
Physical exercises	21	35.0	42	70.0	57.082	<0.001**
Physiological symptoms	17	28.3	41	68.3	19.062	<0.001**
Symptoms associated with sexual activity	16	44.4	26	72.2	4.636	0.031*
Psychological symptoms	12	20.0	33	55.0	14.222	<0.001**
Total patients' knowledge satisfactory level	15	25	40	66.7	20.836	<0.001**

*p <0.05 significant; **p <0.001 highly significant.*

Table (2) revealed that, there was significant improvement of the studied patients' total knowledge regarding CHFD post guidelines implementation with highly statistically significant differences (p< 0.001). Except knowledge related to sexual activity.

Table (3): Frequency and percentage distribution of the studied patients' total practice pre and post guidelines implementation. (n=60).

Items	Satisfactory level of practice				Chi-square	
	Pre		Post		X^2	P-value
	N	%	N	%		
Deep breathing exercises	0	0.0	49	81.7	79.527	<0.001**
Relaxation exercises	0	0.0	44	73.3	66.303	<0.001**
Range of motion exercises	27	45.0	48	80	14.222	<0.001**
Pulse measuring	12	20.0	56	93.3	62.685	<0.001**
Total patients' practice satisfactory level	10	16.7	49	81.7	50.290	<0.001**

**p <0.001 highly significant.

Table (3) clarified that, there was significant improvement of the studied patients' total practice post guidelines implementation with highly statistically significant differences (p < 0.001).

Table (4): Frequency and percentage distribution of the studied patients' levels of dyspnea pre and post guidelines implementation. (n=60)

Dyspnea level	Pre		Post		Chi-square	
	N	%	N	%	X^2	P-value
Level 0 (No dyspnea)	0	0.0	0	0.0		
Level 1 (Mild)	0	0.0	34	56.7		
Level 2 (Moderate)	4	6.7	13	21.6	57.043	<0.001**
Level 3 (Severe)	24	40.0	7	11.6		
Level 4 (Very severe)	32	53.3	6	10.0		

**p <0.001 highly significant

Table (4) shows that, there was highly statistically significant difference between levels of dyspnea of the studied patients pre and post guidelines implementation (p< 0.001).

Table (5): Difference between mean scores of sleep quality for the studied patients pre and post guidelines implementation. (n=60).

Sleep quality Index (0 - 33)	Pre		Post		Paired T- test	P-value
	Mean	SD	Mean	SD		
	17.62	2.14	11.05	2.95	9.551	<0.001**

**p-value <0.001 is highly significant

Table (5) illustrated that, there was highly statistically significant difference between mean scores of sleep quality for the studied patients pre and post guidelines implementation with significant decrease in mean score.

Table (6): Percentage distribution of the studied patients regarding fatigue pre and post guidelines implementation. (n=60)

Items	Pre			Post			Chi-square	
	Good	Average	Poor	Good	Average	Poor	X^2	P-value
	%	%	%	%	%	%		
Physical well-being	0.0	6.7	93.3	16.7	70.0	13.3	77.391	<0.001**
Perceptual well-being	6.7	25.0	68.3	36.7	53.3	10.0	44.674	<0.001**
Social well-being	0.0	15.0	85.0	15.0	60.0	25.0	44.836	<0.001**
Sexual well-being	0.0	16.7	83.3	18.3	60.0	21.7	47.428	<0.001**
Total	0.0	18.3	81.7	21.7	60.0	18.3	50.365	<0.001**

**p <0.001 highly significant

Table (6) shows that, 93.3%, 68.3%, 85.0% and 83.3% of the studied patients had poor physical, perceptual, social and sexual well-being regarding fatigue pre guidelines implementation which improved to 13.3%, 10.0% 25.0% and 21.7% post guidelines implementation respectively with highly statistically significant differences (p < 0.001).

Table (7): Difference between mean scores of the studied patients regarding mood pre and post guidelines implementation. (n=60)

Items	Pre		Post		Paired T- test	P-value
	Mean	SD	Mean	SD		
Depression (0 – 28)	19.85	2.76	17.27	2.139	3.183	0.014*
Anger (0 – 16)	12.70	2.37	10.49	2.50	7.943	<0.001**
Tension (0 – 16)	13.37	2.14	9.91	1.48	14.423	<0.001**
Confusion (0 – 16)	12.64	2.11	12.10	2.03	1.742	0.132
Fatigue (0 – 8)	7.18	1.54	6.22	2.01	7.344	<0.001**
Vigor (0 – 20)	2.65	1.95	4.40	1.24	6.353	<0.001**

*p >0.05 insignificant; *p <0.05 significant; **p <0.001 highly significant.*

Table (7) shows that, there was highly statistically significant differences between mean scores of anger, tension, fatigue and vigor subscales for the studied patient pre and post guidelines implementation with significant decrease in mean score (p< 0.001).

Table (8): Relation between studied patients' total knowledge regarding CHFD and their demographic characteristics pre and post guidelines implementation (n=60).

Item	Patients' total knowledge							
	Pre				Post			
	Satisfactory (n=15)		x^2	p-value	Satisfactory (n=40)		x^2	p-value
	No.	%			No.	%		
Age (years)								
40-<45	4	26.7			7	17.5		
45-<50	8	53.3	0.778	0.678	22	55.0	0.469	0.791
50-55	3	20.0			11	27.5		
Gender								
Male	10	66.7	0.497	0.481	31	77.5	0.012	0.914
Female	5	33.3			9	22.5		
Marital status								
Married	13	86.7	0.054	0.816	35	87.5	0.020	0.887
Unmarried	2	13.3			5	12.5		
Educational level								
Illiterate	0	0.0			0	0.0		
Read & write	8	53.3	20.794	<0.001**	32	80.0	25.714	<0.001**
Diploma education	7	46.7			8	20.0		

*p >0.05 insignificant; *p <0.05 significant; **p <0.001 highly significant.*

Table (8) reveals that, there was statistically insignificant relation between patients' total knowledge and their demographic characteristics including age, gender and marital status (p> 0.05). While, there was highly statistically significant relation between patients' total knowledge and educational level pre and post guidelines implementation (p< 0.05).

Table (9): Correlation between studied patients' total knowledge and clinical outcomes pre and post guidelines implementation (n=60).

Items	Total satisfactory mean score of knowledge			
	Pre		Post	
	r-value	p-value	*r-value*	p-value
Dyspnea level	-0.424	<0.001**	-0.375	0.016*
Sleep quality score	-0.291	0.037*	-0.368	0.022*
Fatigue score	0.280	0.043*	0.411	<0.001**
Profile of mood state	-0.033	0.752	-0.152	0.373

r-Pearson Correlation Coefficient;

*p-value >0.05 is insignificant; **p-value <0.001 is highly significant*

Table (9) illustrated that, there was highly negative significant correlation between patients' total knowledge and dyspnea level pre guidelines implementation. While there was highly positive significant correlation between patients' total knowledge and fatigue score post guidelines implementation.

4. DISCUSSION

Chronic heart failure disease (CHFD) is a major and increasing global health problem with enormous amount of expenditure of direct/ indirect health-care costs. CHFD is a slowly progressive, devastating incurable disease that affects many people and severely limits their quality of life over time and it is considered as one of the most challenging medical issues because of its influence on personal, public health and its impact on the economy *(Holloway, 2019; Perry and Rasool, 2021).*

The cardiac disability patient who needs medical treatment, needs also a set of complementary and progressive measures, which would aim at improving the clinical condition and global physical condition. So, researches had led to increase the efficiency of complex cardiac rehabilitation therapies to prevent the occurrence of exacerbations, improving the symptomatology, improve the quality of life and maintain the patient in daily activities for a longer period of time *(Richman, 2021).*

Concerning socio-demographic characteristics of the studied patients results of the present study revealed that, more than half of the studied patients belong to age group between 45≤ 50 years old with mean age 47.83± 8.13 years. This results are in agreement with *Abd El Rahman (2017),* who reported in his conducted study which was entitled: "Discharge Plan Model for Coronary Artery Disease Patients" that the CHFD is more common in persons forty to fifty five years of age. While the finding of the current study is inconsistent with what was reported by *Androas (2019),* who reported in his conducted study which was entitled: "Effects of education and support on self-care and resource utilization in patients with heart failure" that the study subjects ranged in age from fifty two seventy five years. This indicates that chronic heart failure disease affecting any aging process.

Regarding gender of the studied patients results of the present study revealed that, more than three quarter were males this finding may be due to the higher prevalence of smoking among this gender in addition to occupational factor. This finding is inconfrast with *Abd El Gaber (2019),* who reported in his conducted study which was entitled: "A plan of Discharge for Cardiothoracic surgery patients" that females are more likely to have chronic heart failure disease than male. This indicates that both men and woman are liable to experience chronic heart failure disease equally.

As regards the marital status, the current study found that the majority of the studied patients were married. These may be because the studied patients age group got married during this age according to their culture. Also this may reflect that married people might be more liable to heart disease more than singles because they always facing physical and psychological stress of their social role. This finding goes in the same line with *Appel et al. (2017)* who reported in their conducted study which was entitled: "Racial and Socio-economic Difference as Risk Factors for Cardiovascular Disease" that married patients represent the higher percentage.

As regards the educational level, near two third of the patients were able to read and write and the minority of them had diploma education. This may be due to conduction of the study in governmental hospital in which there are high percentage

of low socio-economic class patients who aren't educated. Educational level will help the patients to understand a health care provider's direction and may increase their knowledge and improve the outcomes. This is beneficial according to what was stated by *Appel et al. (2017),* who reported in their conducted study which was entitled: "Racial and Socio-economic Difference as Risk Factors for Cardiovascular Disease" that, the highest percentage of the studied sample were able to read and write also stated that, the educational level is considered a personal issue that influences the individual ability to cope.

Concerning the studied patients' occupation, about two third of them had occupation. All of the working patients are exposed to a heavy duty that need to manual and physical effort, which may explain their effecting by CHFD. This results supported with what was reported by *Abd El Atief (2019),* who found in his conducted study which was entitled: "Effect of Counseling on the Condition of Patients with Heart Failure" that, about two third of studied sample had manual work which need more physical activities was considering as risk factors and may be lead CHFD than occupation need mental activities. Also the present results reveled that, about one third of the studied patients didn't work, this might be due to the changes of their work abilities.

On the same scope, the study result declared that, all of the studied patients hadn't enough income according to their opinion, this might be due to the changes of their work abilities and increase their daily living finance because of the disease treatment cost. This study result is in the same line with *El Sayed (2019),* who reported in his conducted study which was entitled: "Orientation Guideline for patients undergoing cardiothoracic surgery" that, the approximately of the studied sample hadn't enough income.

The present study revealed that, all of the studied patients were living with their family. In relation to number of family members as reported by the studied patients the current study showed that, more than two thirds of them were living with more than five family members. In relation to house ventilation as reported by the studied patients, most of them were living in badly ventilated houses. This may contribute to the high incidence of the dyspnea.

As regards housing location, it was found that all of the studied patients living away from follow up setting (rural area). These findings might be interpreted as unavailability of specialized hospitals in rural areas. This study result is congruent with *Appel et al. (2017),* who found in their conducted study which was entitled: "Racial and Socio-economic Difference as Risk Factors for Cardiovascular Disease" that, the highest percentage of the studied sample was from rural areas with bad ventilation.

In respect to the patients' total knowledge the results of the current study indicated that, there was significant improvement in the studied patients' total knowledge post guidelines implementation compared to pre with highly statistically significant differences, except patients' knowledge regarding sexual activity.

From the researcher opinion unsatisfactory level of the studied patients' knowledge pre the designed guidelines implementation reflected the lack of continuous education and in-service training program for such group of patients, also this indicates that patients' level of knowledge not affected by the long duration of illness.

The significant improvement in level of the studied patients' knowledge post implementation of guidelines this might attribute to effectiveness of guidelines on enhancing patients' knowledge and empower patients through increased their awareness regarding their responsibilities toward manage their disease which increased their readiness for learning new things.

This study result is in agreement with those of *Palec and Al Bert (2021),* in their conducted study which was entitled: "managing heart failure: teaching your client how to stay at home" that, revealed low level of knowledge of CHFD patients in the initial of baseline data knowledge assessment for the patients and patients' knowledge improved after attending to the training programs.

This study finding is supported by *Marx (2015),* who found in their conducted study which was entitled: "guidelines for cardiac rehabilitation programs" that, the patients had poor level of knowledge before implementing of the designed teaching protocol and there was a great improvement in knowledge score levels after implementing of the designed teaching protocol.

This study result is in concordance with *Tortora et al. (2018),* who indicated in the study which was entitled: "Developing a supportive- educative program for patients with advanced heart failure within Orem's general theory of nursing" that, there was significant improvement in total scores and all items of knowledge before and after applying health education program.

The results in the present study represented that, there was significant improvement in the studied patients' practice post guidelines implementation compared to pre with highly statistically significant differences.

In the present study, unsatisfactory level of the studied patients' practice before the designed guidelines implementation could be attributed to lack of their knowledge pre the guidelines implementation which reflected on their performance, in adequate training program, lack of qualification. Also, this might be due to the patients' beliefs that a lot of the procedure care are related the physician responsibilities.

The significant improvement in level of the studied patients' practice post the guidelines implementation might be related to the skills acquired during implementation of guidelines regarding breathing exercise, relaxation exercise, range of motion exercise and pulse measuring which affect positively their practice level. Also, might be due to that the improvement in practical level of patients are linked with their relevant scientific knowledge.

This study result is in similar with *Coats et al. (2015),* who mentioned in his conducted study which was entitled: "Effects of physical training in chronic heart failure" that, there was a highly statistically significant difference in patients' level of performance between pre and post designed teaching protocol and noted inadequate practice level in pre designed teaching protocol which improved to become satisfactory in post designed teaching protocol.

This study finding is in agreement with *Nicholas (2015),* who mentioned in their conducted study which was entitled: "Hardiness, self-care practice and perceived health status in older adults" that, continuing education is required to maintain competence in practice. Education may take the form of on the job training, programs, workshops or conferences that education has a significant impact on the knowledge and competencies of the patients.

Regarding patients' clinical outcomes the current study illustrated that, there was highly statistically significant difference between levels of dyspnea for CHFD patients, in which more than half of the studied patients had severe dyspnea pre guidelines implementation. This may be due to the long duration of illness, as more than two third of the studied patients had the disease for more than five years and lack of practicing breathing exercise accurately and regularly. This result is similar to *Gift et al. (2017),* who mentioned in his conducted study which was entitled: "Relaxation to reduce dyspnea and anxiety in CHFD patients" that, all of the patients said to have dyspnea and the analysis made using MRC dyspnea scale revealed that 73.3% of the patients had severe dyspnea

While only one tenth of them had sever dyspnea post guidelines implementation, this may be due to the effective continuous practice of breathing exercise which could have a positive effect on improving respiratory muscles. The findings concluded that there was decrease in the dyspnea severity after implementation of guidelines, the study same result was supported by *Fukuda (2018),* who reported in their conducted study which was entitled: "Outcome standards for the patients with chronic heart failure" that, there was improvement in the MRC scale of dyspnea after the cardiac rehabilitation program.

Concerning sleep quality, the results of the present study showed that there was highly statistically significant difference between mean scores of sleep quality for patients with CHFD pre and post implementation of guidelines, with significant decrease in mean score denoting positive change in sleep quality. This may be due to the positive effect of the guidelines on patients' performance particularly controlling breathing difficulties which affected their sleeping pattern positively.

This result is similar to *Susan (2017),* who found in their conducted study which was entitled: **"**Self-care strategies of symptoms management in patient with chronic heart failure" that, cardiac rehabilitation resulted in significant improvement in sleep quality, as indicated by the scores of PSQI (Pittsburgh sleep quality index) which decreased from 17.62 ± 2.14 to 11.05 ± 2.95 furthermore.

The results of the present study represented that, there was significant improvement in the studied patients' physical, perceptual, social and sexual well-being regarding fatigue post guidelines implementation compared to pre with highly statistically significant differences. This might attribute to the influence of guidelines on improving patients' symptoms experience related to fatigue and its effect on physical, perceptual, social and sexual well-being.

This result was supported by *Barbara (2015),* who found in his conducted study which was entitled: "Effect of a minimal intervention to increase physical activity, daily living activity" that, almost all of the studied patients (95.3%) experienced high levels of fatigue and has a profound influence on patients, affecting functional performance, mood and one's overall quality of life. Also they recommended for management from national and international experts and societies focus on

patient and family education regarding cardiac-related fatigue, exercise and physical activity and psychological interventions. This may be due to patients' compliance with the guidelines of energy conservation.

The present study showed that, there was a highly statistically significant difference between mean scores of total mood disturbance pre and post implementation of guidelines with significant decrease in mean score denoting positive change in patients' mood. This may be due to that, the guidelines implementation had positive effect on decreasing their level of dyspnea which subsequently improved their quality of life and their mood.

This finding is in agreement with the findings of a similar study by *Miller (2017),* who mentioned in his conducted study which was entitled: "Coping with chronic illness: overcoming power less ness" that, patients receiving the MPI (minimal psychological intervention) had significantly fewer depressive symptoms and fewer symptoms of anxiety at nine months than patients receiving usual care. Also *Bennett et al. (2019),* stated in his conducted study which was entitled: "Psychosocial variables and hospitalization in persons with chronic heart failure" that both the anxiety and depression associated with CHFD responded well to pharmacologic and non-pharmacologic therapy in their study about anxiety and depression in CHFD.

Regarding the relation between patients' total knowledge and their demographic characteristics the result of the current study revealed that, there was statistically in significant relation between patients' total knowledge and their demographic characteristics regarding age, gender, marital status, while there was highly statistically significant relation between patients' total knowledge and level of education pre and post guidelines implementation, whereas the patients with high level of education had go satisfactory level of knowledge. This indicates that education has a vital role in improving the knowledge of the patients. Also, this may explain that the designed guidelines reflected positively on studied patients' knowledge specialty among the patients with high of education. Education and training had a vital role in improving the knowledge of the patient.

Regarding correlation between patients' total knowledge and clinical outcomes. The current study result clarified that, there was positive correlation between patients' total knowledge and fatigue score, while there was negative correlation between patients' total knowledge and dyspnea level, sleep quality score and mood state pre and post guidelines implementation. This finding denoting the positive effect of the guidelines on patients' outcome.

This result is supported with *Hartweg (2017),* who showed in their conducted study which was entitled: "Self-care actions of healthy middle-aged women to promote well-being" that, there was significant effects of the educational intervention on studied subject, there was improvement in heart disease symptoms, increased physical activity and improved psycho-social health.

Lastly, the current study finding stresses the importance of developing and implementing training programs for patients with heart failure disease to improve their knowledge and practice which reflected positively on their outcome.

Finally, the results of this part supported the stated hypothesis that, the designed self-care guidelines will improve the studied patients' knowledge, practice and clinical outcomes (dyspnea, sleep, fatigue and mood).

5. CONCLUSION

The results of this study concluded that:

The designed self-care guidelines for patients with chronic heart failure disease had statistically significant positive effect on improving their knowledge, practice and clinical outcomes regarding dyspnea, sleep, fatigue and mood with highly statistically significant differences, which support the study hypothesis.

6. RECOMMENDATIONS

The result of this study projected the following recommendations:

• Further researches are recommended periodically to be carrying out on new approaches in the area of management of patients with CHFD and evaluate its effect on patients' outcomes.

• Replication of the current study on a larger probability sample is recommended to achieve generalization of the results and wider utilization of the designed program.

- Establish interdisciplinary approach in management of CHFD.

- Educational program for patients with CHFD should be applied in all cardiac units and should be up- dated periodically in order to enhance knowledge and functional status for those patients.

- Follow up care for patients with CHFD through phone calls and clinical visits.

- Setup a project that aims to improve patient care by implementing evidence based practice.

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