

Effect of Instructions by Zone Tool on Self- Care and Quality of Life among Patients with Congestive Heart Failure.

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Abstract

Abstract: Chronic disease management is the key target in many healthcare systems for adult patients. Patients' in-dependability is a crucial aspect to deal effectively with such diseases, especially, Congestive Heart Failure (CHF) as an epidemic chronic illness in Egypt. Zone tool as a health education strategy can be a magic self-care tool for such patients, which includes the necessary health care instructions and guidance for CHF. Thus, this study aims to investigate the effect of instructions by zone tool on self- care and quality of life among patients with congestive heart failure. An exploratory descriptive design followed by pre-post quasi-experimental design was employed, at the three medical sections of Gamal Abdel Nasser Health Insurance Hospital in Alexandria, Egypt. A convenient sample of 256 patients with CHF was recruited as a survey group and experimental group. Two tools were used: Heart Failure Self Care Management Questionnaire (HFSCMQ) and the Minnesota Living with Heart Failure Questionnaire. The findings of the survey group showed that there was insufficient self-care management as reported by CHF patients, including self-care' maintenance, management, and confidence elements. In addition to, they perceived lack in their quality of life (QOL). The findings of the experimental group denoted an improvement of CHF patients' perceptions about self-care management and its elements and their QOL before and after using of the developed zone tool, in the second and third assessments. This result proved that the instructional intervention using zone tool was an effective self-learning reference among Egyptian CHF patients. **Conclusion and recommendations**, health education tools as teaching strategies for CHF patients, are a crucial nursing activity to encourage CHF patient' self-care management and enhance their QOL at all. Zone tool is an effective strategy to be used with CHF patients in Egypt. **Further studies** are studies about; the relationship between CHF patients' health literacy and their adherence with their treatment, and, the effect of electronic health education material on CHF patients' self-care management, satisfaction, QOL and self-efficacy.

Key words: Zone Tool, a Health Education Strategy, Congestive Heart Failure patients, self-care management, and quality of life.

Introduction:

Helping chronically ill patients and their families to deal effectively with their health care management needs is a necessary issue in nursing paradigm and healthcare field at all. A lot of patients with such long-lasting

illnesses have inadequate awareness regarding their healthcare. Most of those patients are unable to take self-care management decisions. Thus, they have intense needs regarding health education that can aid them in managing and dealing

effectively and autonomously with their disease features when the nurse or the doctor are not present. (Besely et al., 2018; Fathi et al., 2020)

Self-care is a group of actions that allow the client to maintain his/her health condition by following the therapeutic regimen, adhering to the healthcare instructions, and controlling the illness' signs and symptoms of the illness. When the disease features are taking place, the patients necessitated taking many important health related decisions, mainly, in relation to self-care management. Self-care is fundamentally affected by self-confidence and self-efficacy of the clients' capabilities. In other evidence, it includes 3 basic behaviors; self-care management, self-confidence, and autonomous self-decisions (ElGerges 2020; Fathi et al., 2020) Health literacy with disease process and its management is the core role of the patients to effectively achieve fit self-care management. Patients should have enough knowledge, skills and values regarding the disease and own self-care. Consequently, they can assess, monitor, and manage their health-related complaints, in an energetic, thoughtful decision-making process of self-controlling behaviors. (ElGerges 2020; Besely et al., 2018) Self-care management enhances clients to be more independent to achieve all health care in absence of health staff.

Self-care management is the activity to keep health status stable based on suitable, accurate and correct decisions; mainly this term is used with the chronic illnesses. So, it is evolving all behaviors that focus on health maintenance of biological, psychological, and spiritual conditions. Moreover, it directs to decrease the incidence and prevalence of morbidity and mortality, lessen of hospital and health facility cost, rise patient's satisfaction, and empower the level of their quality of life (QOL), particularly during chronic illnesses like kidney or heart disease.

(Driscoll et al., 2009; Fathi et al., 2020; Keif et al., 2016)

Congestive Heart Failure (CHF) is a prevalent and chronic health-condition in Egypt which needs an expensive health-cost and leads to patients' inability to achieve their roles in the community. As well, it is a serious health problem that faced the healthcare workforce all over the world and can cause death among 18% of those who have such chronic disease. CHF is a result of an inability of the heart to preserve enough blood flow to the body organs. It may lead to a lot of congestive diseases (e.g., hepatomegaly, kidney failure, cardiomyopathy, myocardial infarction, and hypertension). It has many significant and dangerous signs and symptoms such as dysnea, exhaustion, peripheral and central edema, insomnia, orthopnea, dry and wet cough, powerlessness to achieve daily living activities, and weight gain as a result of fluid retention. Faintness, palpitations, anxiety, dysrhythmias, hypotension and poor QOL can be other CHF risky symptoms. (Stewart et al., 2018; Stonerock, & Blumenthal, 2017; ElGerges 2020)

Therefore, those patients with CHF necessitated to have a comprehensive and accurate health teaching for managing the disease' signs, and symptoms, and be able to control any sudden health complications. They must be competent in self-care management practices, such as frequent adherence with medications, diet monitoring, weight control and daily living activities execution. Such chronic symptoms need awareness and literacy to be managed well. Nowadays, many patients are seeking health education, empowering their self-care management, and using of the advanced medical care, but, in Egypt and worldwide, they still have many complications and deprived QOL. (Stewart et al., 2018; Przybylska, et al., 2014; Stonerock, & Blumenthal, 2017)

QOL reflected the whole picture of healthcare effectiveness, predominantly

with chronically ill patients. It is a crucial and dynamic aspect which clarifies the impact of disease and the role of patients' self-care and health facility efficiency. It is defined as subjective awareness of the individual in relation to their own well-being position in life. It can be tailored and modified or managed by mutual efforts between the health staff as nurses and patients to comprehend the needs of the disease and how the patient can cope with it effectively. (Stonerock, & Blumenthal, 2017; Stewart et al., 2018; Costa et al., 2020) Many studies denoted that there is a massive reduction in the QOL of CHF patients. There are a lot of factors that may significantly affect the QOL among CHF patients, such as associated diseases as diabetes, respiratory insufficiency, and hyperlipidemia or kidney diseases. Other factors include the use of some medication like hormones, lack of physical activity, poor dietary habits, smoking and alcoholism. On the other hand, personality traits, sex, age, and heredity are other factors. Management of such factors can be a great cause for maintaining the stability of CHF patient's conditions and prevent many of CHF complications, like, pneumonia, pulmonary embolism, stroke, organ failure, sudden death, and disabilities. Health education is the main method to empower CHF patients to stabilize, improve, modify, and manage their health status. (Ahmad et al 2017; Marques et al., 2017; Fathi et al., 2020; Stewart et al., 2018) Health education is a vital need for CHF patients, which is a great responsibility of the nurse and considers a foundation of nursing activities. There are numerous health education utilities to aid the nurse and the patients in evaluating, adjusting, encouraging, instructing, managing, reinforcing, and altering unhealthy behaviors to healthy ones. Instructional aids and tools are necessary to inform and educate CHF patients with the necessary knowledge and skills to keep independent

and perform self-care management with chronic disease. One of the health education and self-care management tools is the zone tool, which is a crucial support for patients with chronic diseases. (Walker 2011; Bodenheimer, 2021; Fathi et al., 2020)

Zone tool is one of the instructional tools in health education field. It is mostly used by the health educators to improve patients' health literacy, self-efficacy, self-awareness, and self-care management with chronic disease. It can be defined as a diagrammatic illustration of the concepts, processes, principles, or techniques in the form of colored steps or zones that comprise the phases of the disease. It includes all the signs and symptoms of every phase of the patients' long-lasting disease. By captions or clarifications and examples, zone tool represents management activities for the disease process and its complications. Such tool considers a self-reference instrument that can be used by the patients at any time or place. It supports the patient to use specific health instructions for monitoring his/her health status. Therefore, it intends to keep illness steadiness and guide the patients in managing the disease or seek healthcare when needed. (Donald, et al., 2018, Ahmad et al 2017; Marques et al., 2017, Fathi, 2020)

Additionally, the zone as an instructional aid signifies each phase of the disease in a specific color as a traffic signals. The patient can be directed by the colors in each phase (zone) that contains predetermined instructions to be done by the patient to manage any health problem during the chronic disease. Accordingly, the patient can judge his/her condition consistent with the colored zone and execute the instructions cautiously as shown in the tool and apply self-care management independently. Nurses as health educators have a significant role in health teaching for supporting their patients using such

instructional tools like, zone tool. Such tools are vivid methodologies that can help patients to succeed in applying self-care management and empower all features of their QOL, mainly with chronically ill patients with CHF. (Donald, et al., 2018, Berns, 2019, Tout & Boulware, 2017, Fathi, 2020).

Significance of the study

Health education tools such as zone tool guide CHF patients in a form of self-reference handout printed material. It entails a diagram with pictures and colors that are fundamentally proposed for encouraging and directing patients to actively share in their self-care management independently. Thus, a patient with CHF has to such materials to properly manage their disease' problems and may maintain better QOL. Therefore, the purpose of the current study is to investigate the effect of using zone tool as a health education strategy, on self-care and quality of life among patients with congestive heart failure. Nurses as health educators might apply such tools to aid CHF patients managing health problems as a beneficial step to develop patient health literacy, enhance their self-care practices, and raise the level of their QOL and the whole well-being state. To accomplish the study purpose, the following hypotheses were established.

Theoretical framework

Health education is an essential process for patients with CHF. Its success is based on the educational and training and teaching, particularly during crisis time, which is a valuable for their achievement progress in CHF care. Constructivism and behaviorism theories declared that the person should be taught through her/his interaction with the environment. Zone tool is a significant part of CHF patients' environment. Such tool tends to build the critical thinking and problem-solving abilities among patients.

Operational definition of Zone tool: it is one of the health education instructional tools which represents diagrammatic illustrations and guidance of the concepts, processes, principles, management or techniques in the form of colored steps or zones that comprise the phases of a certain disease. It includes all phases of the patients' long-lasting disease.

It supports the patient health literacy as a self-reference for monitoring his/her health status.

Research hypotheses:

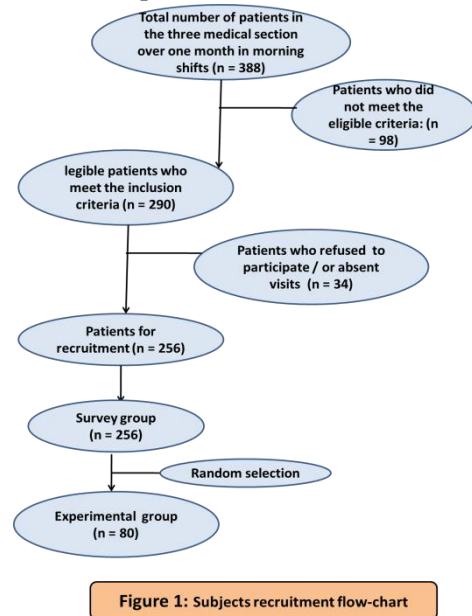
The following hypotheses were developed:

- Patients with Congestive Heart Failure who are instructed by a developed zone tool exhibit higher scores in A Self-Care of Heart Failure Index than those who were not instructed by such strategy.
- Patients with Congestive Heart Failure who were instructed by a developed zone tool exhibit lower scores in The Minnesota Living with Heart Failure Questionnaire than those who were not instructed by such strategy.

Materials & method

Study design: An exploratory descriptive design was used in the first phase of the study, and pre-post quasi-experimental design was operated in the second phase of the study.

Sample and setting: The study was accomplished at the three medical sections of Gamal Abdel Nasser Health Insurance Hospital in Alexandria, Egypt. A purposive



sample of 256 CHF adult patients recruited as a **survey group**. Then, randomly, the researchers recruited thirty percent of the survey group to be an **experimental group** who comprised 80 CHF patients and had been instructed by the developed zone tool. The study samples' sizes were calculated by Epi Info 2019 (Minimal number for survey group was 250 and for a study group was 77).

The researchers used the matching approach to ascertain equalization between survey and study groups. Subjects' inclusion criteria are age varies in-between 20 to 60 years old, alert, able to communicate, read, write, have a confirmed diagnosis with CHF since at least two years, have no of systemic associated diseases, and willing to join the study after signing the written informed consent. See **figure I** for recognizing the subjects recruitment flow-chart.

Study tools: Two instruments were used:

• **Heart failure self-care management questionnaire (HFSCMQ)**. It involved two parts:

A. Socio-demographic data sheet for assessing age, sex, marital status, residence, length of hospitalization etc...

B. Self-Care of Heart Failure Index (SCHFI): it was developed by Riegel et al., in 2009 for measuring self-care behavior and determined the level of self-care adequacy with CHF patients, as a self-reporting tool. This tool has 3 subscales: self-care maintenance (10 items), self-care management (6 items), and self-care confidence (6 items). The Likert scale was used for assessing CHF self-care achievement with numerical values that varied from 0-4 or 1-4, for each item, based on the rate of performance of self-care activities. Each subscale has a consistent score of 100; e.g., a self-care maintenance score mean compared to poor, 70 (16.9), good 80 (12.2), and expert, 85 (5.0). The sub-scale of self-care maintenance ranges from 1= never or rarely and 4 = always or

daily. While, the sub-scale of the self-care management, which includes 6 items; the first ranging from 0= didn't recognize the symptoms at all to 4= I recognize the symptoms very quickly. The second, third, fourth and fifth items of this sub-scale parallels to a range between 1= not likely to 4= very likely. For the third sub-scale, self-care confidence, it ranges from 1= not confident to 4= extremely confident.

• **The Minnesota Living with Heart Failure Questionnaire (MLHFQ)** was developed in 1984 and modified in 2005 based on Rectors' work to evaluate the level of Quality of Life (QOL) among patients with CHF. It intended to relate clinical assessments and patients' perceptions to their QOL. It comprises of 21 items in a 6-point Likert scale, ranges from 0-5; in terms of: 0 = no, 1 = very little, and 5 = very much. Each item and the scale against it are used to indicate how the CHF features affects patients living as they wish, during the previous four weeks. The statements reflected the 4 aspects that are affecting the QOL among patients with CHF: physical, emotional, social, and mental states. The MLHFQ total score sorts from 0 to 105, the higher score denoted the lower the QOL.

Both tools were translated into Arabic by three specialists in Arabic, English and medical terminology to maintain tools applicability, feasibility, and clarity. Reliability and Validity of both tools were demonstrated in prior studies and re-checked by the researchers that revealed accepted values. The **SCHFI** was checked by Cronbach Alpha Coefficient Statistical Test $> \alpha = 00.82$. The MLHFQ was confirmed a more acceptable level of reliability; $> \alpha = 00.85$. Content validity was investigated for both by a jury of 5 experts in the related specialties to confirm content and face or criterion validity.

Data collection procedure: The approval of the Research Ethics Committee of Alexandria Faculty of Nursing was

obtained before conducting the study. Written permissions to conduct the study were obtained from the previously mentioned setting after explaining the purpose of the study. Study tools were adapted by the researchers after a thorough review of the related literature. Tools were translated to Arabic and tested for their validity and reliability. A pilot for the study tools was applied on thirty CHF patients from the mentioned settings (about 10% of the study sample) who were excluded from study subjects and all required changes were done.

Ethical considerations: Written informed consents were obtained from the study subjects after explanation the aim of the study. Participation in the study was on voluntary basis and the patients ascertained that they have a full right to withdraw from the study at any time. Anonymity of study subjects' data was maintained. Confidentiality of collected data was ensured.

Field work: is included the three medical sections of the mentioned setting. The patients were interviewed individually, in their rooms, and the instructional intervention was carried out in between 1 pm to 4 pm, in which the major patients' routine of care was finished.

The process of data collection and designing of health education sessions were accomplished over five months in between June 2022 to October 2022 throughout four sequential phases, as following: pre-test, planning, conduction and post-test phases:

• **Pre-test (Survey phase):** Study tools were distributed among the survey group on an individualized basis in the attendance of the researchers to direct them in any vague questions.

• **Planning phase:** According to a comprehensive review of related literature and the assessment phase, zone tool as a self-care and self-reference tool was designed and developed involving

objectives, contents, instructions, pictures, and instructions as a health education strategy. It is developed in a form of traffic light shape with 4 zones which represented the phases of the disease. The zone tool content was reviewed by a jury of 3 experts in the related fields to confirm its content and face or criterion validity. The jury scientifically tested the tool content to govern if it enclosed the suitable data and instructions or behavior domains to be implemented by the patients. Likewise, the jury focused to determine to which extent such tool is parallel with the related evidence and theories supported the details of the disease management behaviors in the zone tool content containing pictures, information and activities that should be implemented by the patients as a health education strategy. As well, the tool was used by eight CHF patients who were excluded from the study groups for checking its feasibility. Accordingly, modifications on the zone tool were carried out.

• **Conduction phase:** The zone tool as a health education strategy in the formula of a handout, graphic assistance and a self-reference form was used among the experimental group only (30 % who selected randomly from the survey group and met the inclusion criteria). The researchers taught each patient on an individualized bases, how he/she can use the zone tool in each phase of the CHF disease. Each patient received a booklet that includes a complete data about the CHF involving signs & symptoms, causes, diagnosis, treatment, and self-care management in each phase of the CHF as presented in the zone tool. The patients in the experimental group were taught how to maintain their health status as stable as possible and seek help if they were exposed or felt certain dangerous signs as clarified in each phase in the colored developed

zone tool which in a form of 4 zones of a traffic light shape.

In the developed zone tool as a health education strategy, each phase of the CHF, there are some instructions and precautions that encourage the patient to manage own health independently or seek a doctor's or a nurse's help, all those clarifications were given to each patient in the experimental group using the Arabic booklet. Each patient repeated twice how he/she can use the developed zone tool independently at home. The researchers answered all patients' questions about the developed tool. Each patient received 2 sessions and copies of the Arabic booklet and the zone tool. Each teaching session with each patient lasted around two hours. After the instructional intervention with zone tool, the researchers followed up the experimental group very restrictively by phone calls every day and met them every three days for three months at the mentioned setting' inpatients or outpatients sections.

• **Post- test:** the experimental group filled the study tools again as a post-test. Then, after one month of a comprehensive follow up to the experimental group, the researchers used the study tools again for a third time. Therefore, the study tools were filled by the study subjects over 3 times: (1) before using the developed zone tool (in the survey phase with the survey group) as a baseline data collection as a 1st assessment, (2) after the two sessions of instructions with zone tool (for experimental group only) as a 2nd assessment and (3) after one month after the two sessions of instructions with the zone tool (for experimental group only) as a 3rd assessment.

The scores of the study tools before and after the instructions with the zone tool as health education strategy among the study subjects in the three assessments were

compared. The difference between the scores was appraised to conclude the effect of using the developed zone tool as a health education strategy and as a self-reference for patients with CHF.

Limitations of the study: there were some external variables; like, relatives advise patients' readings and internet literacy. The researchers provided a great effort to control the patients for attending the sessions and instruct them to focus on the intervention than any other health education resources.

Data analysis: The collected data in the survey phase and experimental phase was computerized and fed with codes, then analyzed and organized and presented with suitable tabulation and graphs. Statistical Packages for the Social Sciences (SPSS) version 20.0 for Windows 10 and Microsoft Excel Spread Sheet Package (Office 2010) were operated. Tests for descriptive data were frequency, percentages, mean and standard deviation as well as for comparisons and significance of analytical data were: chi-square, T test and P values.

Results:

The findings of the present study included the results of two phases:

- The findings of Subjects' sociodemographic characteristics
- The findings of the survey group, and
- The findings of the experimental group

Subjects' sociodemographic characteristics:

Table I clarifies that there were more than one half of the survey, and the experimental groups (54.7 %, 56.3%) were in their forties age-wise that denoted young age, and the largest part (73.4%, 76.3%) of both groups were males. Additionally, more than one half of them (52%, 56.2 %) were married, however, a minimal percent of both (24.6%, 26.6 %) were widowed.

Nearly one half (47.7%, 51.3%) of the two groups were workers. In addition, over one half of the survey group (51.6%) have a preparatory or primary school level, whereas around similar percent in the experimental group (51.2%) have technical or secondary school level. Likewise, more than one half of both groups (53.1%, 52.5%) have respiratory sufferings with CHF. Approximately two thirds of both groups (57.8%, 63.7%) have smoking habits. As a final point, almost all of both groups (93.4% and 1.3%) certainly not use any of self-care references before. Globally, there no statistically significant difference was detected between the both groups as regards socio-demographic characteristics, level of significance = < 0.05

• **The findings of the survey group**

These findings are presenting in tables 2, 3 and 4, including the perceiving: self-care maintenance, self-care management, and self-care confidence among the survey group in tool 1 (the Self Care of Heart Failure Index (SCHFI))

With reference to Table 2, it illustrates the perceived self-care maintenance by the survey group. It was observed that the largest part of the scale items, excluding items No. 2 and 5, represented a mean below 2.00 that denoted low level of the perceived self-care maintenance among the survey group at all. Concerning items (2 & 5), the participants in the survey got a mean which, somewhat exceeding 2.00, regarding "checking ankles for swelling and keeping doctor or nurse appointments". Therefore, and generally, the table signified that there were insufficient self-care maintenance views that represented by means below 2.00 which equals below 50%. As well, and as observed the total means scores = 1.5 for all scale items. This is consistent with Riegel et al., 2009, who approved that if the perceived self-care at the SCHFI scale and its sub-scales was less than 70%; this indicates insufficient participants' self-care.

As regards table 3, most of the patients in the survey group (91.4%) reported that they have observed suffering in breathing or ankle swelling in the earlier 4 weeks. Only those patients (91.4%) were investigated for their perceived self-care management, and they documented the following results: the mean was below 2.00 for most of the scale items for the symptom recognition, the treatment implementation, and the treatment evaluation. This finding signifies insufficient self-care management among survey group, particularly in item 6 that has the most declined mean (0.77) in relation to the assurance that the remedy helped. As observed, the total means' scores = 1.3 for the totally self-care management items which illustrated the insufficient perceived self-care management among survey group generally.

As pertaining to self-care confidence among survey group as showed in table 4, totally all patients in the survey group have perceived low self-confidence, as evidenced that they have means' scores below 2.00 which signifies insufficient self-care confidence (total mean scores is below 50%). Furthermore, the items 1, and 6 that are representing "Confident in being free from HF symptoms" and "Evaluate how well a remedy works" got means' scores less than 1. Mostly, the overall means' scores = 1.4 for all scale items that indicated insufficient self-care confidence between the survey group.

Perceived QOL among survey group

In line with the findings in Table 5 in relation to the perceived quality of life (QOL) between the patients in the survey group, exactly all of patients' means' scores ranged from 3 to 5, which denoted that they have a high perception about the worst effects of CHF on their QOL at all. Therefore, all scores are equal to 70 % to 100 % percentages. It was observed that the effects of CHF on Egyptian patient's daily living activities were negative and accordingly with negative effects on their

QOL. All scale items got a mean score = 4.22 which showed the inferior QOL perceptions of the CHF patients in the survey group. The uppermost means' scores were (4.78, 4.77, 4.83) regarding 4, 10, & 13 statements, in terms of, "Working around the house or yard is difficult", "Sexual activities are difficult", and "Getting tired, fatigued, or having low energy". Conversely, the lowermost means' scores were (3.11, 3.28) in relation to 17 & 19 statements, in terms of "Feeling of a burden on family or friends", and "Leading cause of worry". Overall, the overall means' scores = 4.21 for all items of the scale that indicated an adverse view of the survey group regarding their QOL with CHF disease.

• **The findings of the experimental group**

As seen in table 6, the perceived self-care maintenance among the experimental group before and after implementing of the instructional intervention with the developed zone tool in the 1st, 2nd, and 3rd assessments. It was observed that all the statements of the perceived self-care maintenance scale have means' scores below 2.00, before the instructional intervention in the 1st assessment, except in items 5 & 9, which have means' scores with slightly above 2.00. However, in the 2nd assessment and immediately after the instructional intervention, the CHF patients in the experimental group reported means' scores that are above 2 in relation to the majority of the perceived self-maintenance scale items, except in items 1, 2 and 7. Such scores are still below 70% which also denoted insufficient CHF patients' perceptions of self-care maintenance. While, in the 3rd assessment, and after the instructional intervention by one month almost all of the CHF patients in the experimental group got means' scores above 2.00 by 50% to 60% percentages that still signified their inadequacy in the perceived self-care maintenance items,

except in items 3, and 6, the patients got means' scores above 3, which are indicating sufficient perceived self-care maintenance and above a 70% percentage. Overall, means' scores of CHF in the experimental group regarding the perceived self-maintenance scale showed a slight observed progress in the 2nd and 3rd assessments, after the instructional intervention using the developed zone tool. Also, the total mean score signified this improvement. Accordingly, there is a strong statistically significant difference between the 1st, 2nd, and 3rd assessments for the whole scale statements, as tested by one way ANOVA F- test and $P = 0.000$

Concerning table 7, it shows the perceived self-care management among the experimental group within the three assessments. Respectively, about three quarters (76.2%, 72.5 & 61.2) of the CHF patients in the experimental group suffered in breathing or in ankle swelling before the instructional intervention in the 1st assessment. Only those patients (76.2%, 72.5 & 61.2) were investigated for their perceived self-care management, and they documented the following results; for the 1st assessment, all those CHF patients perceived self-care management with low means' scores (2.00). Therefore, there is no statistically significant difference between the three assessments among the CHF in the experimental group in relation to the occurrence of CHF symptoms: $X^2 = 4.64$, $p\text{-value} = 0.10$. Only CHF patients who are in the experimental group and experience the symptoms complete the remaining statements of the scale of the perceived self-care management scale items.

But, after the instructional intervention in the 2nd assessment, and the 3rd assessment those CHF patients have observed positive progress in their perceived self-care management means' scores to be above 3.00 which indicated 75% percentages and signifies self-care management sufficiency. Mainly such

progress was noticed in items 2, 3 & 6. Accordingly, the total means' score of the 3rd assessment clarified the apparent positive progress in the perceived self-care management after the instructional intervention using zone tool among the CHF patients in the experimental group **who, only have the experience of CHF symptoms**. Consequently, there is a **STRONG** statistically significant difference between the three assessments at all items of the perceived self-management scale, using one way ANOVA F-test and $P = 0.000$.

Consistent to table 8, the CHF patients in the experimental group have insufficient self-care confidence in the 1st assessment (survey phase). They got means' scores less than 2.00 and accordingly have less than 50% percentages of self-confidence adequacy, excluding in item 18, only. But such means' scores rose in the 2nd assessment to be 2.14 to 2.66 which showed improvement, but still, also, less than 70% percentages of self-confidence adequacy. While, in the 3rd assessment and after the instructional intervention using the zone tool, those means' scores increased to be in between 2.56 to 3.07, which almost directed to self-confidence adequacy with percentages above 70%, predominantly in items 3, 4, & 6. Yet, in the remaining items of the scale, the CHF patients in the experimental group still have scarce self-care confidence. Such findings illustrated that the CHF patients in the experimental group perceived improved self-care confidence after the instructional intervention using zone tool. This improvement is slightly noticed, but approved the effectiveness of the intervention, which is reflected in the total means' scores. Additionally, there was a **STRONG** statistically significant difference between the three assessments at

all the perceived self-confidence scale items which tested by one way ANOVA F-test and $P = 0.000$.

In relation to table 9 which clarifies the perceived QOL among the CHF patients in the experimental group before and after the instructional intervention using the zone tool, in the 1st assessment, there are high means' scores in the perceived QOL for all scale items, which reflected the suffering of the experimental group with CHF disease. Such means' scores are between 3.11 to 4.63, denoting 60 % to 100 % percentages of the scale and poor views of QOL among experimental group. While, in the second assessment, such means' scores decreased to be 2.52 to 3.88, excluding item 15 (mean' score = 4.12), which showed a lessened QOL. Generally, there is an apparent improvement than in the 1st assessment.

In the 3rd assessment, it is obvious that the means' scores of the perceived QOL among the patients in the experimental group are decreased which means an improvement in CHF patients' QOL, as proven that the means' scores ranged 1.16 to 2.22. In the 3rd assessment, all scale items have means scores less than 2.5 which specified constructive perceptions concerning QOL. Thus, the perceived QOL among the patients in the experimental group before and after the instructional intervention using the zone tool in the 1st, 2nd and 3rd assessments are diminished, that is denoting improvement in the patients QOL. Accordingly, there was a **STRONG** statistically significant difference in between the three assessments at all statements of the perceived QOL scale as tested by one way ANOVA test and $P = 0.000$.

Table I: Subjects' sociodemographic characteristics among both study' groups

Subjects' sociodemographic characteristics	Study' groups				Significant test (X ²)
	Survey (N=256)		Experimental		
	No.	%	No.	%	
Age					
20 ≤ 30	24	9.3	2	2.5	X ² = 4.25 p-value= 0.24
30 ≤ 40	52	20.4	18	22.5	
40 ≤ 50	140	54.7	45	56.3	
Sex					
Male	188	73.4	61	76.3	X ² = 0.25 p-value= 0.62
Female	68	26.6	19	23.7	
Marital status					
Single	44	17.2	41	16	X ² = 9.63 p-value: 0.02*
Married	133	52	144	56.2	
Divorce	16	6.2	3	1.2	
	63	24.6	68	26.6	
Work nature					
Worker	122	47.7	41	51.3	X ² = 2.58 p-value= 0.63
Employee	46	17.9	13	16.2	
Farmer	30	11.7	13	16.3	
Retired	35	13.7	7	8.7	
Level of Education					
High ♦	32	12.5	19	23.8	X ² = 45.42 p-value= 0.00**
Moderate♦♦	56	21.9	41	51.2	
Lower than	132	51.6	10	12.5	
Moderate♦♦♦	26	10.1	10	12.5	
Associated sufferings:					
Gastrointestinal	31	12.1	12	15	X ² = 5.75 p-value = 0.22
problems. NS	28	10.9	10	12.5	
problems▶	26	10.2	12	15	
Renal disease	136	53.1	42	52.5	
Smoking					
Yes	148	57.8	51	63.7	X ² = 0.89 p-value= 0.35
No	108	42.2	29	36.3	
Using self-care					
references Yes	17	6.6	7	8.7	X ² = 0.41 p-value = 0.52
No	239	93.4	73	91.3	

♦ = bachelor or associate education ♦♦ = technical or secondary school ♦♦♦ = preparatory or primary school. ▶ NS = Nervous system X² = Chi square test
* = p 0.05 ** = p 0.01 *** = p 0.001

Table 2: Perceived self-care maintenance among the survey group, as illustrated by mean and standard deviation (n= 256)

Perceived Self-Care Maintenance statements	Survey group' baseline data (n=256)	
	Mean	SD
1. Weigh daily.	1.13	0.53
2. Check ankles for swelling.	2.22	0.47
3. Try to avoid getting sick (flu shot, avoid ill people)	1.28	0.44
4. Do some physical activity.	1.00	0.65
5. Keep doctor or nurse appointments.	2.09	0.87
6. Eat a low sodium diet.	1.67	0.67
7. Exercise for 30 minutes	1.39	0.94
8. Remember to take medicine.	1.73	0.88
9. Remember to take medicine.	1.27	0.53
9. Ask for low-salt items when eating out or visiting	1.53	0.74
Total	1.5	0.67

Table 3: Perceived Self-care management among the survey group as illustrated by mean and standard deviation.

Perceived Self-Care Management Statements	Survey group' baseline data	
	No.	%
Trouble breathing or ankle swelling in the past month.		
Yes	234	91.4
	22	8.6
	(N=234)	
a. Symptom recognition	Mean	SD
1. Symptoms recognized (specifically dyspnea and leg swelling)	1.22	0.23
b. Treatment implementation		
2. Reduce salt in diet.	1.16	0.41
3. Reduce fluid intake.	1.44	0.31
4. Take an extra water pill.	1.63	0.57
5. Call doctor or nurse for guidance	1.55	0.43
c. Treatment evaluation		
6. Assurance that the remedy helped	0.77	0.28
Total	1.3	0.33

Table 4: Perceived self-care confidence among the survey group as illustrated by the mean and standard deviation.

Perceived Self-Care Confidence Statements	Survey group' baseline data (n=256)	
	Mean	SD
1. Confident in being free from HF symptoms.	0.84	0.48
2. Follow the treatment advice given.	1.22	0.35
3. Evaluate the importance of symptoms.	1.64	0.58
4. Recognize changes in health if they occur.	1.63	0.43
5. Do something that will relieve symptoms.	1.82	0.55
Total	1.4	0.51

Table 5: Perceived quality of life among the survey group as illustrated by mean and standard deviation.

Perceived QOL statements	Survey group' baseline data (n=256)	
	Mean	SD
1- Swelling in ankles or legs	4.34	1.82
2- Sitting or lying down to rest during the day	4.55	0.97
3- Walking or climbing stairs are difficult	4.46	0.95
4- Working around the house or yard is difficult	4.78	1.09
5- Going places away from home is difficult	3.68	1.4
6- Sleeping well at night is difficult	4.68	0.83
7- Doing things with friends or family is difficult	3.89	0.96
8- Working to earn a living is difficult	3.85	1.67
9- Recreational pastimes, sports or hobbies are difficult	4.47	0.84
10- Sexual activities are difficult	4.77	1.4
11- Eating less of liked foods	4.37	1.5
12- Having shortness of breath	4.39	0.93
13- Getting tired, fatigued, or having low energy	4.83	1.03
14- Leading cause for staying in a hospital	4.26	0.84
15- Costing money for medical care	4.18	0.72
16- Leading cause of side effects from treatments	4.23	0.77
17- Feeling of being a burden on family or friends	3.11	0.89
18- Feeling loss of self-control in life	3.88	0.88
19- Leading cause of worry	3.28	1.01
20- Leading cause of difficulty in concentration or	3.83	0.74
21- Leading cause of feeling depressed	3.54	0.93
Total	4.21	1.4

Table 6: Perceived self-care maintenance, before and after using the instructional intervention using the zone tool, in the 1st, 2nd, and 3rd assessments among the experimental group as illustrated by mean and standard deviation.

Perceived Self-Care Maintenance statements	Experimental CHF Group (N=80)						F-Test	P-value
	First assessment		Second assessment		Third assessment			
	Mean	SD	Mean	SD	Mean	SD		
1. Weigh yourself daily.	1.52	1.03	1.92	0.87	2.13	1.27	6.52	0.002**
2. Check ankles for swelling.	1.44	0.67	1.78	0.65	2.44	1.24	25.76	0.000***
3. Try to avoid getting sick (flu shot, avoid ill people)	1.56	.57	2.00	1.94	3.44	0.68	50.99	0.000***
4. Do some physical activity.	1.87	1.1	2.34	0.91	2.76	0.85	50.99	0.000***
5. Keep doctor or nurse appointments.	2.14	0.85	2.14	0.65	2.87	1.05	18.97	0.000***
6. Eat a low sodium diet.	1.94	0.56	2.77	0.78	3.89	1.31	87.12	0.000***
7. Exercise for 30 minutes	1.78	1.08	1.98	1.54	2.26	0.65	3.52	0.031*
8. Remember to take medicine.	1.95	0.76	2.22	1.23	2.74	1.43	9.36	0.000***
9. Ask for low salt items when eating out or visiting others.	2.35	0.67	2.75	0.88	2.93	0.87	10.68	0.000***
10. Use a system (pillbox, reminder) to help in	1.93	1.22	2.18	0.95	2.72	0.86	12.499	0.000***
Total	1.84	0.85	2.2	1.04	2.8	1.02	19.845	0.000***
	* = p	0.05	** = p	0.01	*** = p	0.001		

Table 7: Perceived self-care management before and after using the instructional intervention using the zone tool, in the 1st, 2nd, and 3rd assessments among the experimental group as illustrated by mean and standard deviation.

Perceived Self-Care Management statements	Experimental Group (n=80)		Experimental Group (n=80)		Experimental Group (n=80)		X ²		
	First assessment		Second assessment		Third assessment				
	No.	%	No.	%	No.	%			
Trouble breathing or ankle swelling in the past month: Yes No	61 19	76.2 23.8	58 22	72.5 27.5	49 31	61.2 38.8	X ² = 4.64 p-value = 0.10		
	Experimental Group (n=61)		Experimental Group (n=58)		Experimental Group (n=49)		F-Test	P-value	
	First assessment		Second assessment		Third assessment				
	Mean	SD	Mean	SD	Mean	SD			
a. Symptom recognition									
1. How quickly were heart failure symptoms recognized (specifically dyspnea and leg swelling)?	1.76	1.08	2.17	0.79	2.68	0.87	13.373	0.000** *	
b. Treatment implementation									
2. Reduce the salt in your diet.	1.45	0.65	2.75	0.45	3.12	0.64	127.68		
3. Reduce fluid intake.	1.74	0.58	2.47	0.76	3.34	1.06	3		
4. Take an extra water pill	1.98	1.52	2.73	1.04	2.94	0.34		0.000**	
5. Call doctor or nurse for guidance	1.11	0.75	1.89	0.89	2.76	0.56	53.623	*	
c. Treatment evaluation									
6. Assurance that the remedy helped	1.24	0.56	2.86	0.89	3.26	1.09	11.620	0.000**	
Total							65.028	*	
	1.5	0.85	2.47	0.80	3.01	0.76	89.031	0.000** *	

* = p 0.05

** = p 0.01

*** = p 0.001

Table 8: Perceived self-care confidence before and after using the instructional intervention using the zone tool, in the 1st, 2nd, and 3rd assessments among the experimental group as illustrated by mean and standard deviation.

Perceived Self-Care Confidence statements	Experimental Group (n=80)						F-Test	P-value
	First assessment		Second assessment		Third assessment			
	Mean	SD	Mean	SD	Mean	SD		
1. Confident in being free from HF symptoms.	1.88	0.68	2.14	0.67	2.64	0.68	26.11	0.000***
2. Follow the treatment advice given.	2.05	0.67	2.24	1.04	2.76	0.85	4.4	0.000***
3. Evaluate the importance of symptoms.	1.96	0.65	2.28	0.65	3.07	1.05	40.2	0.000***
4. Recognize changes in health if they occur.	1.77	1.06	1.83	0.96	2.89	1.31	25.3	0.000***
5. Do something that will relieve symptoms	1.89	1.22	2.66	1.18	2.56	0.65	12.7	0.000***
Total	1.97	0.56	2.45	0.56	2.94	1.43	21.1	0.000***
	1.92	0.80	2.27	0.84	2.82	0.99	21.24	0.000***
	* = p 0.05		** = p 0.01		*** = p 0.001			

Table 9: Perceived quality of life (QOL) before and after using the instructional intervention using the zone tool, in the 1st, 2nd, and 3rd assessments among the experimental group as illustrated by mean and standard deviation.

Perceived QOL statements	Experimental Group (N=80)						F-Test	P-value
	1st assessment		2nd assessment		3rd assessment			
	Mean	SD	Mean	SD	Mean	SD		
1. Swelling in ankles or legs	4.11	0.82	3.56	0.76	1.26	0.75	302.676	0.000**
2. Sitting or lying down to rest during the	3.77	0.91	3.22	0.83	2.22	0.83	67.183	0.000**
3. Walking or climbing stairs are difficult	4.55	1.85	2.95	0.77	2.05	0.93	78.848	0.000**
4. Working around the house or yard is difficult	4.18	0.79	3.55	0.92	2.00	1.7	69.275	0.000**
5. Going places away from home is difficult	3.68	1.4	3.88	1.03	1.54	0.79	110.784	0.000**
6. Sleeping well at night is difficult	3.88	0.73	3.12	0.92	2.04	1.4	61.445	0.000**
7. Doing things with friends or family is difficult	3.49	0.76	2.54	1.03	1.16	0.73	151.714	0.000**
8. Working to earn a living is difficult	3.05	0.83	2.63	0.94	2.18	1.85	9.095	0.000**
9. Recreational pastimes, sports or hobbies are difficult	4.48	0.93	3.77	0.91	1.49	0.92	230.647	0.000**
10. Sexual activities are difficult	4.87	1.7	3.54	1.85	1.55	1.03	90.875	0.000**
11. Eating less of the liked foods	4.44	1.85	3.13	0.79	2.13	0.83	68.016	0.000**
12. Shortness of breath	4.39	0.92	3.36	0.82	1.35	0.93	240.678	0.000**
13. Getting tired, fatigued, or having low	4.63	1.03	3.04	0.91	2.13	1.7	80.403	0.000**
14. Leading cause for staying in a hospital	3.36	0.94	2.52	1.85	1.68	1.03	31.553	0.000**
15. Costing money for medical care	4.38	0.92	4.12	1.03	2.18	1.4	89.687	0.000**
16. Leading cause of side effects from treatments	3.23	0.87	3.12	0.94	1.54	0.73	98.732	0.000**
17. Feeling a burden on family or friends	3.11	0.84	3.64	0.92	2.06	0.76	72.874	0.000**
18. Feeling a loss of self-control in life	3.88	0.76	2.85	0.79	1.48	1.03	153.766	0.000**
19. Leading cause of worry	3.65	1.81	2.55	1.4	1.65	0.92	39.589	0.000**
20. Leading cause of difficulty concentrating or remembering things	3.33	0.94	2.91	0.73	1.23	1.03	119.622	0.000**
21. Leading cause of feeling depressed	3.37	0.87	3.17	0.84	1.53	0.94	104.262	0.000**
Total	3.9	1.07	3.2	0.99	1.8	1.05	85.019	0.000**

* = p 0.05

** = p

0.01

*** = p

0.001

Declaration of interest (all authors) None

Discussion:

Self-care maintenance and self-care management are ultimate goals among the patients with CHF. Also, they are important targets for any health-care organizations. Health education and its methodologies can enhance those targets and help CHF patients to be more

independent, autonomous and decision makers in their chronic. CHF is a life-long disabling condition that needs patients to be health literate and adhered with all necessitated health care activities. CHF patients can stay more stable when being informed and literate by all self-management practices. (Przybylska, et al.,

2014; Stonerock, & Blumenthal, 2017; Costa et al., 2020)

Self-reference aids and educational materials are the core tools that can be used in CHF patient health education and can improve their self-care maintenance, management, and confidence. Nurses as health educators should design, plan, construct, apply and assess such aids as important strategies in the whole nursing practices. They prepare all types of educational materials such as audio-visual materials, booklets, graphics, charts, brochures, pamphlets, Power-points, flyers, pictures, posters and models, which are crucial strategies to be integrated in patient health education plan. (Costa et al., 2020; Fathi, et al, 2020)

In the current study, in relation to the survey group' findings, there are obvious adverse views regarding self-care management. Concerning the 3 components self-care management (self-care maintenance, self-care management, and self-confidence) and especially in self-care maintenance, the great part of survey group views reported means' scores below 2 which signified insufficient self-care maintenance attainment. Such finding denotes that the survey group has minimal health literacy regarding dealing with CHF signs and symptoms. Therefore, the CHF patients in Egypt have limited awareness about their self-care in such dangerous disabling chronic disease, which can be a serious problem that can face the health-care professionals. Matching with this result, Riegel, et al., in 2009, discussed that the self-care management and its components, mainly self-care maintenance, should involve all self-care activities in relation to: controlling CHF symptoms, and adherence to treatment obedience. If CHF patients have no awareness by such components, they will have negative health complications. CHF

symptom assessment and understanding are a crucial self-care among such group. Additionally, Tung et al., 2019, described that self-care awareness to observe and recognize the CHF problems and try to deal effectively are essential health-related perceptions and main features of self-care management and maintenance. CHF patients with limited awareness by such behaviors can be facing many harmful health defects and illness deterioration. Therefore, CHF patients have to be alert and literate with self-care maintenance practices, such as: follow drugs intake, exercise, low salt diet, leg assessment, and scheduled follow up.

As pertaining to self-care management perceptions among survey group, most of them have sufferings in breathing and ankle (swelling) in the last 4 weeks and have perception' means scores below 2.00 in recognizing disease symptoms, treatment carrying out and its evaluation. This finding signified that they have insufficient self-care management. CHF patients in Egypt should have clear awareness about their condition to take fit health-care decisions regarding symptom and needed health-care behaviors, but, such awareness is absent. This finding is in harmony with Meng in 2018, who clarified that CHF patients have poly-pharmaceutical activities, and they have an intense need to be instructed carefully about these activities, mainly with patients who started they CHF with myocardial infarction. In particular, patients who undergoing cardiac-catheterization has an extreme requirement for health instruction, mainly about self-care management activities and homecare, to manage disease symptoms and treatment. As well, and in support with the study of Rankin, & Stallings, in 2022 who reported that patients' health literacy provides a great reinforcement for constructive initiations

and beneficial self-care management to deal effectively with the chronic disease and maintain it stable as possible. Nurses as health educators should provide chronically ill patients, enough knowledge, skills, and values to aid them in managing the illness problems. Contradicting to this view, Fathi et al., in 2020, who conducted such study in Egypt and discussed that self-care management is the person's capability to manage disease's symptoms, drugs utilization, complications and any health concerns, and without patients' awareness, and competent health education, the patients may face a great suffering and even death. As well, Tung et al., 2019, recommended that it is forbidden and refused in the health-care system, to let the CHF patients without proper health teaching and health-care instructions, because such health education is a necessary for ensure CHF patients' self-care management with such epidemic chronic disease.

Concerning the finding regarding survey group's self-confidence perceptions, they have means' scores below 2 that indicated insufficient self-care confidence. Self-care confidence should enhance among CHF patients as an appreciated indicator for good self-care management among those patients. It helps the CHF patients to fight, cope and be independent as long as possible. Self-confidence is tied with empowerment, positive health beliefs and improves self-aptitudes for achieving an acceptable level of self-care. But the present study approved that Egyptian patients with CHF have insufficient self-care confidence, this is in the line with a study of Meng, et al., in 2018, highlighted that the almost all of CHF patients and other cardiac prolonged conditions have limited self-care confidence for coping with such chronic sufferings. Inconsistent to this result, Riegel, et al.,

in 2009, described that it is important for patients to have strong internal feelings and motives to enhance their own self-care confidence and consequently, their capabilities for achieving self-care activities. Further and dissimilar to current study finding, Dickson, et al., in 2014, emphasized that the CHF patients must use a wisdom, insight and intelligence to empower their own self-care confidence and self-efficacy to establish the needed self-care practices. With reference to the present result as regards the survey group's QOL perceptions, a great part of them has negative views with their chronic conditions. This result can be interpreted that the Egyptian CHF patients have a great burden to control and manage such life-long disease. Therefore, they have insufficient perception of their QOL and consequently, limited self-care. Therefore, a huge effort should be established to help such patients in improving their views toward their QOL. Similarly, to this finding, Vellone et al., in 2013, argued that many patients with chronic illness cannot tolerate the sufferings and the problems of the prolonged disease which adversely affects QOL and all components of the patients' wellbeing, in terms of: physically, emotionally, and mentally. It is supposed that negative views of QOL among patients may lead to adverse influences on own self-care and thus directed to poor health outcomes. Therefore, it is significant to improve Egyptian patients' QOL perceptions which may enhance their self-care and improve their health conditions.

Unlike to this finding, Conceição et al., in 2015, illustrated that the chronic disease features have a great impact to enforce patients to adapt positively with illness and apply all self-care practices for improving their feelings with the quality of life. Constructive self-care

activities help to alleviate chronic illness manifestation and as a result improve the QOL among CHF patients. CHF is a serious and epidemic health problem in Egypt with high incidence and prevalence, but, with limited prognosis as mentioned by Fathi et al., 2016. Thus, patients have to enough health literacy to cope with any health problems and complications that can affect negatively on their perceptions toward the QOL.

For matching the first research hypothesis, the current study approves that the use of the developed zone tool as a self-reference for self-care management or as a self-guide has apparent effects on the views of CHF patients as regards self-care management, predominantly for its positive impact on patients' knowledge in relation healthcare practices that congruent with the first study' hypothesis. It is noticed that there was a strong statistically significant difference between the three assessments of the experimental, before and after the instructional intervention using the developed zone tool, regarding their perceptions of self-care management components and QOL, which is contradictory to the survey group perceptions, the variation is observed mainly in the third assessment.

For the experimental group' perceptions of self-care maintenance, it is noticed an improvement before and after the instructional intervention, especially, in second and third assessments. Thus, the zone tool confirms its efficiency as a good self-care management guide and self-learning tool for CHF patients in Egypt. This result is supported by Aleda et al., in 2009, who found that there is a strong relationship concerning health literacy and self-care maintenance with CHF patients. Patients with proper health educations and use of illustrative teaching tools can acquire fit knowledge and skills which help them in coping

with their chronic illness. With health literacy, CHF can do correct self-care practices, control sudden manifestations, then, the prognosis will be better. Vice versa, CHF patients with limited health awareness have inadequate self-care maintenance or management. Similarly, to current result, Fathi et al 2020 discussed that the health education instructional materials such as the zone tool can be used as a reminder for doing all needed self-care activities. Patient's instructions are a fundamental nursing responsibility and accountability to equip CHF patients with enough health education to manage such chronic dangerous condition. Moreover, and parallel to this views, Siabani et al., in 2015, explained that the health education materials in home-based visits and use of self-learning aids with the patients who suffer from CHF, can enhance their self-care maintenance, self-care management and self-care confidence as a whole. However, Fathi et al., in 2015 illustrated that the developing and utilization of health education strategies or instructional materials are cost exhaustive matters. It needs a significant financial supply with innovative technology and online research that are cost burden on a country such Egypt as a developed country. But those materials are needed extremely among CHF patients in Egypt.

With respect to the second research hypothesis, about QOL' perceptions among CHF patients in the experimental group, most of them have an observed improvement in their views regarding their QOL, before and after the instructional intervention using the developed zone tool, in between the three assessments, mainly the third one. In the same line with this result, Siabani et al., discussed that the well-educated patients with CHF who have proper guidance and instructions and obtain a self-reference

for health education at home, will adjust competently with his/her own disease sufferings physically, socially, emotionally, and psychologically, which reflected positively with their view to the QOL. Additionally, and congruently, Babae et al., in 2019, highlighted that the QOL has a great benefit through health education practice. Patient education instructional strategies promote health maintenance, health restoration, rehabilitation, QOL.

Also, Jaarsma et al., in 2016, found that there was a significant rise in the QOL' scores among the supportive educational group that is observed after 6 months. The control group who passed through routine nursing health education, which is very limited, compared with the experimental group who obtained the supportive education, indicated a great improvement in all the dimensions of the QOL, after the second measurement. In contradiction, to such result, Taibanguay et al., in 2019, discussed that QOL can have no change if patients are not stratified with health education activities. If they do all daily living activities by following the instructional tools, then, have got worse signs and symptoms of the chronic disease, they will have insufficient QOL perceptions. Therefore, the QOL measurement is dependent on to which extent the steadiness of the chronic disease is. Many factors may affect it, like social interaction, personal experience with illness, beliefs, thinking abilities, self-care level and self-efficacy. Overall, CHF education by a teaching strategy like zone tool is a magic cane for improving self-care maintenance, management, confidence and QOL. Nurses as health educators should develop special instructional techniques and methodologies for each disease, particularly chronic ones. They should acquire all recent knowledge and skills in educational psychology, technology, and

communication sciences to be competent in the field of patient health education.

Conclusion

CHF is a serious chronic illness in Egypt; patients with such disease have an observed diminishing in their perceptions regarding self-care management (including self-maintenance, self-management and self- confidence) and their QOL. The developed zone tool as a self-reference learning tool among CHF patients confirms an apparent success in improving self-care management (including self-maintenance, self-management and self- confidence) and QOL. Health education printed aids are still needed, particularly, in Egypt and in between CHF who may not be able to use electronic health information. They are essential health education strategies to reflect the significant role of nurses as health educators. CHF literacy among patients about self-care management and their coping with such chronic disease is a core mission and significant responsibility of the professional nurse.

Recommendations and further studies

CHF is a common, disabling, and exhaustive disease in Egypt with an observed poor prognosis with high incidence and prevalence. CHF patients must receive a variety of teaching strategies, tools and educational experiences in CHF health education. At the same time, nurses as health educators must tailor, design, and implement all types of health education techniques and media with CHF patients, predominantly about their self-care management and QOL; which is the core management of such life-long disease. Teamwork among all health-care specialties should help to develop the health education materials for CHF disease and all these efforts must be integrated in nursing curricula. The existing study presented some insights about further studies; (1) the relationship between CHF patients'

health literacy and their adherence with their treatment. (2) The effect of electronic health education material on CHF patients' self-care management, satisfaction, QOL and self-efficacy. (3) Replication of the study with another patients group (respiratory disease) with another standardized evaluation instruments with investigation clinical indicators such as X rays, arterial blood gases, and cardiac enzymes.

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References:

- Ahmad, T., Munir, A., Bhatti, S.H., Aftab, M. and Raza, M.A. (2017) Survival Analysis of Heart Failure Patients: A Case Study. PLoS ONE, 12, e0181001. <https://doi.org/10.1371/journal.pone.0181001>
- Aleda MH, Chen KS. Kimberly YS. Matthew PM, Mason MH. (2009) Health Literacy and Self-Care of Patients with Heart Failure. Purdue University 6(3); 8-35
- Babae G, Keshavarz M, Shaiegan M. (2019) Effect of a Health education program on quality of live in patients undergoing coronary artery bypass surgery. Acta Medica Iranica 45(1) 69-75
- Berns JS. (2019) Patient education: Chronic kidney disease (Beyond the Basics). UpToDate, Inc., available at: <https://www.uptodate.com/contents/chronic-kidney-disease-beyond-the-basics> retrieved in November 2019
- Besely, W., Faheim, S., Mohammed, E. (2018). Effect of Implementing A Health Education Program For Nurses on Satisfaction Level of Patients Undergoing Hemodialysis. Journal of Nursing and Health Science ,7(4), 45-57. . Retrieved from: www.iosrjournals.org.
- Bodenheimer A. (2021) Patient Self-Management of Chronic Disease in Primary Care. Journal of the American Medical Association; 288 (19); 2470.
- Conceição A, Santos M, Santos B, Cruz D. (2015) Self-care in heart failure patients. Rev. Latino-Am. Enfermagem 23(4):578-86 DOI: 10.1590/0104-1169.0288.2591 www.eerp.usp.br/rlae Retrieved in November 2015
- Costa LL, Islam SH, Anowar MN, Abdul Latif M. (2020) Quality of Life of Chronic Heart Failure Patients. Open Journal of Nursing, 2020, 10, 831-857
- Dickson VV, Melkus GD, Katz S, Levine-Wong A, Dillworth J, Cleland CM, et al. (2014) Building skill in heart failure self-care among community dwelling older adults: Results of a pilot study. Patient Educ Couns. [Internet]. [access 10 maio 2014]. Disponível em: <http://dx.doi.org/10.1016/j.pec.2014.04.018>.
- Donald M, Kahlon BK, Beanlands H, Straus S, Ronksley P, Herrington G, Tong A, Grill A, Waldvogel B, Large CA, Large CL, Harwood L, Novak M, James MT, Elliott M, Fernandez N, Brimble S, Samuel S, Hemmelgarn BR. (2018) Self-management interventions for adults with chronic kidney disease: a scoping review. BMJ Open, 8:e019814. doi:10.1136/bmjopen-2017-019814
- Driscoll A, Davidson P, Clark R, Huangd N, Aho Z. (2009)

- Tailoring consumer resources to enhance self-care in chronic heart failure. *Australian Critical Care*; 22, 133—140
- ElGerges NS. (2020) Effects of therapeutic education on self-efficacy, self-care activities and glycemic control of type 2 diabetic patients in a primary healthcare center in Lebanon. *Journal of Diabetes & Metabolic Disorders* 19:813–821
- Fathi A, Tawfik F., Abudari M. (2016) Using a self-care management tool to improve self-care and quality of life in patients with congestive heart failure. *Clinical Nursing Studies* 4, (3) 1-17
- Fathi, A., Aziz, Th., & Eltohamy, O. (2020). Zone Tool: Improving Self-Care and Self-Efficacy among Patients with Chronic Kidney Disease. *American Journal of Nursing*, 8(6), 608-23.
- Jaarsma, T, Hal fens R, Tan F, Abu-Saad HH, Dracup K, Diedriks J. (2016) Self-care and quality of life in patients with advanced heart failure: The effect of supportive educational intervention. *Heart and Lung* 2000; 29(5). 319-330.
- Keif, S.,Shahriari,M.,Sheibani,D.,Rejalian,F.(2016).Effects of Patient Education Program on the Quality of Nursing Care and Inpatient Satisfaction in Surgical Wards of Selected Hospitals in Isfahan, Iran. *Hospital Practices and Research* ,1(4):129-134.<http://www.jhpr.ir>
- Marques de Sousa, M., dos Santos Oliveira, J., Oliveira Soares, M.J.G., Amorim de Araújo, A. and dos Santos Oliveira, S.H. (2017) Quality of Life of Patients with Heart Failure: Integrative Review. *Journal of Nursing UFPE*, 11, 1289-1288
- Meng K, et al. (2018) Evaluation of a self-management patient education program for patients with chronic heart failure undergoing inpatient cardiac rehabilitation: study protocol of a cluster randomized controlled trial. *Bio-Med Central Ltd Cardiovascular Disorders* 13:60 available at <http://www.biomedcentral.com/1471-2261/13/60>
- Przybylska, D., Borzęcki,A., Drop,B & Przybylski,P. (2014). Health education as an important tool in the healthcare system. *Polish Journal of Public Health*, 124(3): 145-7. Retrieved from :<https://www.researchgate.net/publication/315310926>.
- Rankin S, Stallings D. (2022) *Patient Education: Principles and Practice*. New York: Lippincott publisher, 290-400.
- Rector T S. (2005). Overview of the Minnesota Living with Heart Failure Questionnaire. available at http://www.mlhfq.org/_dnld/mlhfq_overview.pdf accessed in October 2015
- Riegel B, Lee C S, Dickson VV, Carlson B. (2009) An update on the self-care of heart failure index. *The Journal of Cardiovascular Nursing*, 24, 485-497. doi:10.1097/JCN.0b013e3181b4baa0
- Siabani S, Driscoll T, Davidson P, Leeder S. (2015) Efficacy of a home-based educational strategy involving community health volunteers in improving self-care in patients with chronic heart failure in western Iran: A randomized controlled trial. *The European Society of Cardiology* 2015. sagepub.co.uk/journalsPermissions.nav av DOI:

- 10.1177/1474515115585651
cnu.sagepub.com
- Stewart S, MacIntyre K, Capewell S, McMurray JJ. (2018) Heart failure and the aging population: an increasing burden in the 21st century. *Heart*. 2018; 89:49–53.
- Stonerock, G. L., & Blumenthal, J. A (2017). Role of counseling to promote adherence in healthy lifestyle medicine: strategies to improve exercise adherence and enhance physical activity. *Progress in cardiovascular diseases, Biomedical and life Sciences journal*, 59(5), 455-62.
- Taibanguay, N., Chaiamnuay, S., Asavatanabodee, P., Pongthorn, & Narongroeknawin. (2019). Effect of patient education on medication adherence of patients with rheumatoid arthritis: a randomized controlled trial. *College of Medicine, Bangkok, Thailand. Medical Press journal*, 13:119-29. Retrieved from :<http://creativecommons.org>.
- Tout DF, Boulware LE. (2017) Tele-health Applications to Enhance Chronic Kidney Disease Knowledge and Awareness among Patients and Providers. *Adv Chronic Kidney Dis.*,24(1): 39–45.
doi: 10.1053/j.ackd.2016.11.017
- Tung H, Lin C, Chen K, Chang C, Lin Y, Chou C. (2019) Self-Management Intervention to Improve Self-Care and Quality of Life in Heart Failure Patients *Congest Heart Fail*; 19(40) E10-E16
- Vellone E, Riegel B, Cocchieri A, Barbaranelli C, D'Agostino F, Glaser D, et al. Validity and reliability of the caregiver contribution to self-care of heart failure index. *J Cardiovasc Nurs*. 2013; 28(3):245-55.
- Walker C. (2011) Effects of the Use of a Heart Failure Diary on Self-Care and Quality of Life. Master's Thesis. UNF Digital Commons. University of North Florida; 65, 1-55