

Effect of Self- Care Guidelines on Knowledge and Practice for Pregnant Woman Suffering from Heart Disease

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Abstract

Background: Heart disease in pregnancy is still a major problem worldwide, particularly in developing countries. The presence of heart disease increases the risk of maternal and fetal complication. **Aim:** The present study aimed to evaluate the effect of self care guidelines on Knowledge and practice for pregnant women suffering from heart disease. **Design:** Quasi experimental research design was used. **Setting:** The study was conducted at Ain shams university Maternity Hospital outpatient clinic **Sample:** purposive sample of 40 pregnant was included in the study. **Tools:** two tools were utilized for data collection; 1) A structured interviewing questionnaire sheet, 2) self –care practice as reported by study sample adopted from **WHO (2014)** and modified by the researcher to assess women's practices regarding heart diseases during pregnancy **Results** of the current study revealed a statistically significant improvement in women's knowledge and practice related to self care of pregnant women suffering from heart disease at the post test. **Conclusion:** implementation of self care guidelines to enhance pregnant women's knowledge & practices about heart diseases during pregnancy, so study mainly **Recommended** that educational program for pregnant women suffering from heart disease should be conducted periodically by nursing staff in outpatient clinic in obstetrics and gynecology department.

Key words: Self Care, Guidelines, Pregnant Women, Heart Diseases.

Introduction

Heart disease remains the leading cause of maternal morbidity and mortality. Early diagnosis and appropriate care can prevent complications and improve pregnancy outcomes. Despite the progress made in managing maternal cardiovascular diseases, heart disease during pregnancy accounts for up to a third of maternal deaths. (Appelman et al., 2015).

During pregnancy, the physiological changes facilitate the adaptation of the cardiovascular system to increase the metabolic needs of the mother, thus enabling

adequate oxygenated blood delivery to the peripheral tissues and fetus. Changes occur in the volume of circulating blood (which affects preload), compliance with and resistance to peripheral blood vessels (affecting later pregnancy), heart muscle function and contractility, heart rate, and sometimes heart rhythm and hormonal nervous system(Silversides et al., 2018).

Heart disease can be difficult during pregnancy. Many normal women experience dyspnea, fatigue, decreased exercise capacity, palpitations, lightheadedness and pedal edema during uncomplicated pregnancy-symptoms suggestive of cardiac disease. The

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physical examination during normal pregnancy reveals a slightly fast resting heart rate, bounding pulses, and a pressure. Venous pressure is usually elevated above the normal range for non-pregnant woman but rarely in a clearly abnormal range (Nishimura et al., 2014).

There are various complications related to heart disease during pregnancy. Maternal complications which include: pulmonary edema, increased maternal morbidity and increased risk for cardiac complication, such as heart failure, arrhythmias and stroke. Fetal complications which include: intrauterine growth restriction (mild in cases of patients with rheumatic heart valve disease and severe in cases of lesions associated with cyanosis in the mothers), neonatal asphyxia, respiratory distress syndrome and fetal or neonatal death (Bhatt & Yeh, 2015).

Self-care guidelines are not new to health care; however, in an effort to control the costs of health care and standardize treatment, and has been shown to result in better patient outcomes and cost-effective care. (Bhatt & Yeh, 2015) Self-care is fundamental to maintenance of health, and prevention and management of chronic illnesses. The WHO definition of self-care and other modern definitions focus mainly on healthy people (Barbara et al., 2017)

Self-care is the process of trying to by individuals and their families on health through the practice of Health Promotion and disease management. People involved in maintaining self-care capture these behaviors necessary to maintain their physical and emotional stability Control includes self-care, the process of breath control for changes in the signs and listen to the symptoms of the body uses a people management self-care when you respond to the signs and symptoms when they occur (Barbara et al., 2017)

In clinical practice, it is supposed that dynamic changes Blood circulation that occur

during pregnancy, associated with daily activities That can affect the quality of life of these women related health although quality of life is a subjective concept and, as such, its assessment depends on each individual's perspective in different dimensions of life. Despite the importance of the topic, little attention has been paid to the human rights of pregnant women with heart disease. Most studies examine the quality of life during pregnancy in healthy or adolescent women or in relation to other pathological processes. (Tirado et al., 2014)

The primary role includes nursing care for pregnant women who suffer from heart disease to protect them from complications that may occur from the heart condition through follow-up during pregnancy and identify individual needs and give them emotional support and physical care (Mckinney et al., 2017) This occurs through the education of women and spouses; evaluation of all systems involved on a routine basis in decision-making with the presence of social and medical experts (butcher et al., 2018)

. The effects of such strategies are mixed. Although some investigators report increased knowledge, results have been inconclusive as to the improvement in self-care behaviors (Dickson et al., 2013)

Significance of the study:

World Health Organization (WHO) estimates heart disease accounts for 1 to 4% in pregnant women worldwide. Maternal mortality in South Africa is rising, and heart conditions currently account for 41 percent of indirect causes of deaths. Little is known about the burden of heart disease in pregnant South Africans. The overall prevalence of pregnant women with heart disease in Egypt was 9.3%. In Egypt 16% of maternal deaths are due to heart diseases during pregnancy. This percentage means that heart disease

during pregnancy is the fourth most common cause of maternal death (Soliman et al., 2016).

In Egypt, managing a pregnant woman with heart disease is a challenge for an obstetrician. The factors that contribute to delaying procedures towards reducing risks and shocking the disease are the lack of awareness regarding the importance of antenatal follow-up among ordinary people. To date, studies conducted in Egypt have discussed heart diseases during pregnancy from a medical point of view, and the role of nurses and women's care is limited - it is necessary to provide Women with heart disease by proposing written guidelines. This study was conducted to highlight high-risk women with heart disease who are challenging to manage them for improvement. Therefore, this study was conducted to evaluate the effect of the self-care guide for pregnant women suffering from the heart.

Aim of the Study:

This study aimed to evaluate the effect of self care guideline on Knowledge and practice for pregnant woman suffering of heart disease through

1. Assessment of woman's knowledge & practice regarding care of pregnant women suffering of heart disease through:
2. Developing & implementing self-care guideline regarding care of pregnant women suffering from heart disease.
3. Evaluating effect of developed self-care guideline to pregnant women suffering from heart disease on woman's knowledge and practice

Research Hypothesis: Self care guideline applied for pregnant women suffering from heart diseases will improve their knowledge and practice.

Setting: The present study was conducted among women with heart disease in the outpatient clinics in maternity and gynecological hospital affiliated to Ain Shams University.

Sampling type: Purposive sample

Sample size: Consists of 40 women diagnosed with heart disease attending the study sitting in outpatient clinic. Sample size was calculated based on a power analysis of $0.95(\beta=1-0.95=0.5)$ at alpha .05(one-sided) with large effect size (0.5) was used as the significance. The sample was recruited according to the following inclusion criteria

Inclusion criteria; Pregnant women were diagnosed by a cardiologist, and attended to the outpatient clinic to follow up , and they had no other complications, gestational age of more than 28 weeks, primitive and multinational women of first and second degree with heart disease regardless of the mother's age

Technical design: Quasi experimental pre-& post intervention tool research design was adopted in this study to achieve the study's aim

Subjects: The sample size was taken within 6 months of all parturient women with cardiac diseases; 40 women were recruited 3 days from 9 AM to 1 PM The last time for pregnant women to be examined at the clinic for this study, according to the inclusion criteria

Tools of data collection:

Two tools of data collection were used to carry out the current study namely; structured interview questionnaire sheet, standardized observation checklist, pregnant women's.

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I. Structured Interview Questionnaire Sheet: closed question

It was developed by the researcher based on review of pertinent literature. It contain two parts –

Part 1: demographic characteristics of the study subjects such as: age, educational level, residence, previous knowledge (Question 1-5).

Part 2: assess women's knowledge regarding self-care of pregnant women suffering from heart disease pre- and post self –care guide line such as (definition, signs & symptoms, Classifications, Risk factors, Types, Complication ,drug administration, Anti natal follow up) (Question 6-13).

Scoring system:

For mothers correct answer was scored (one) and incorrect answers or don't know was scored (zero). All items were summed up; the total knowledge score was further divided into: from 50% and above considered satisfactory level and less than 50% considered unsatisfactory knowledge level.

II. Self care practice as reported by study sample suffering from heart disease

It was adopted from **WHO (2014)** and modified by the researcher. Self-care it contain: one parts and this filled pre and post intervention .Women's practice regarding informatics aspect of care, which includes about; 1) Diet, 2) Daily activities, 3) Sexual Activity, 4) Danger signs during pregnancy and Treatment of heart disease during pregnancy.

Scoring system:

Regarding Mothers "reported practice was scored (one) for the "adequate done" practices and (zero) for "inadequate done" practices. Summed the items of practices and total score level divided into the following; >50% if Adequate reported practices and < 50% if Inadequate reported practices.

Supportive material (Arabic Educational Booklet): It was as pre- & post designed by the researcher based on literature review. It was designed in the form of handout (booklet) using simple Arabic language and different illustrative pictures in order to facilitate understanding its content. It consisted of two parts;

Part 1: it contain knowledge about heart disease e.g. (Definition of heart disease during pregnancy, sings, symptoms, causes, types, effect of pregnancy on heart disease, effect of heart disease on pregnancy and medical treatment.

Part 2: self care aspects which includes informatics aspect of care regarding diet, exercise, sexual activity, danger signs during pregnancy, and treatment of heart disease during pregnancy

• Tools Validity:

Face and content validity of the study tools was assessed by jury group consisted of four experts in maternity and gynecological nursing department of faculty of nursing, Ain-Shams University for comprehensiveness, accuracy and clarity in language. And one experts a cardiologist working at the Heart Academy

Reliability: Alpha Cronbach" s test was used Checks the stability of the tool's internal consistency.

- **II-Operational Design:**

The operational design for this study included three phases namely; preparatory, implementation, and evaluation phase.

- **Preparatory phase:**

This phase started with a review of the current, past, national and international literature related to study subjects, using textbooks, articles, magazines and websites. This review was useful to the researcher in reviewing and developing data collection tools, and then the researcher tested the validity of the tool through jury of expertise to test the content, knowledge, accuracy, and relevance of questions for tools. The researcher Visit the outpatient clinic to assess availability of the place and suitable time

Ethical Consideration:

- Prior study conduction, ethical approval was obtained from the scientific research ethical committee of the faculty of nursing, Ain Shams University. The researcher met both medical and nursing directors of the hospitals to clarify the aim of the study and take their approval. The researcher also met the study subjects to explain the purpose of the study and obtain their approval to participate in the study. They were satisfied with the confidentiality and confidentiality of the data collected, which was used only for scientific research purposes. The material has the right to withdraw from the study at any time it has been confirmed.
- **Pilot study:** Pilot study was carried out on 10% of the total duration of study sample (4 pregnant women in 12 days attending in outpatient clinic according inclusion criteria) to evaluate the applicability, efficiency, attending in 12 days 10% from time of study clarity of tools, assessment of feasibility of field work, beside to detect any possible obstacles that might face the researcher and interfere with data collection.

Necessary modifications were done based on the pilot study findings such as (omission of some questions from tool) in order to strengthen their contents or for more simplicity and clarity. The pilot sample was excluded from the main study sample.

Implementation phase:

Field work description:

- An official letter requesting permission to conduct the study was directed from the dean of the faculty of nursing Ain-Shams University to maternity university hospital- Ain Shams University directors to obtain their approval to carry out this study. This letter included the aim the study and photocopy from data collection tools in order to get their permission and help for collection of data.

Phase 1:

- The researcher attended at Maternity Hospital-Ain Shams University outpatient clinic. 3 days per week from 9am to 1pm .The researcher introduced her to women, explained the aim of the study and its implications on the clinical field, and ensures their cooperation. Then oral and written consent of women were obtained. using face to face interviewing session in order to plan for the next meeting
- The researcher started to fill the interview questionnaire sheet to assess study sample demographic characteristics to maintain confidentiality of the study sample, assessment knowledge as pre- regarding heart disease during pregnancy, assessment practice & assessment self-care as reported by study sample suffering from heart disease

Phase 2:

- The developed self care guidelines were implemented in the training halls at the study settings. 4 to 6 of women in each session.
- The researcher started to explain the self care guideline for the women (Arabic Educational booklet) in a form of lectures; each lecture continued for 30 minutes, the researcher used power point and video to maintain the attention& attraction of

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women 3 theoretical session and 2 practical sessions were conducted.

- An appointment with the research sample is made while she is attending pregnancy follow-up visits every two weeks on an outpatient clinic
- Each session started by a summary about what has been discussed in the previous session and the objectives of the new session, using simple Arabic language, also the session ended by a summary of its content and feedback from the women to ensure that the women got the maximum benefits. The implementation phase took ten weeks
- Session 1, the researcher greeting the study sample and explained the aim of the study, objectives, plan, and content of the developed guideline. Start assessed for knowledge regarding heart disease
- Session 2 theoretical contained explanation of concept of heart disease during pregnancy, causes and risk factors; illustration of different types of heart disease during pregnancy differentiates between effect of pregnancy on heart disease and effect of heart disease on pregnancy and summarized medical treatment of heart disease during pregnancy.
- Session 3: which concluded practical procedure used video to facilitate understanding and application. It includes self care about self-medication administration with maintaining aseptic technique for injectable subcutaneous medication such as Clexane ampoule general examination, assessment of weight and height; Follow up on your weight gain. Getting the right amount of weight supports your little one's growth and development. Gaining too much weight puts additional pressure on your heart
- Session 4 included Local examination such as examination of extremities, and assessment of pitting edema and measurement
- Session 5 the researcher explained ante-natal care visits and illustrated

importance of follow up& provide first aid and referral in sever complication management explained self care related to health education aspect such as Diet, Daily living activities, sexual activity, Drugs, Danger signs during pregnancy explain important of Control anxiety and Get enough rest

- **Phase 3 (Evaluation phase):**

After implementing the developed guideline about self care of pregnant women suffering from heart disease, evaluation of study sample knowledge and practice was done by pre-test and post-test at the end of the program for each woman after two months.

IV-Statistical Design:

The collected data were coded and entered into the statistical package for the social science (SPSS 23.0). Data was presented and suitable analysis was done according to the type of data obtained for each parameter. Data were presented using descriptive statistics in the form of frequencies and percentages for categorical variables, and means and standard deviations for continuous quantitative variables. Qualitative categorical variables were compared using Chi-square (X^2) test but when the expected count is less than 5 in more than 20% of the cells; Fisher. Exact Test was used. Person and spearman correlation was used to examine the correlation between quantitative and qualitative variables. Statistical significance was considered when P-value < 0.05

Results

Table (1) distribution of study sample according to their Demographic characteristics (N=40)

Demographic characteristics	No	%
Age (years):		
▪ <20 years	8	20
▪ 20 : 30 years	11	27.5
▪ 30 :40 years	17	42.5
▪ 40 years& more	4	10
Mean ± SD	36.3±8.2	
Qualification:		
▪ Illiterate	21	52.5
▪ Read and write.	10	25
▪ Secondary school .	9	22.5
Residence:		
▪ Rural	29	72.5
▪ Urban	11	27.5
Previous knowledge		
▪ Yes	6	15
▪ No	34	85

• Table (1) reveals that, 52.5 of the study sample had from thirty to forty years and had illiterate 72.5% of them living in rural area, 15% of them they have previous information from following up on pregnancy

Table (2): Distribution of study sample according to their knowledge about heart diseases pre/post Self care guidelines (N=40)

Items	Pre		Post		X ²	P
	No	%	No	%		
1- Definition						
- Correct	7	17.5	34	85	36.47	0.000**
- Incorrect	33	82.5	6	15		
2- Symptoms						
- Correct	10	25	35	87.5	31.75	0.000**
- Incorrect	30	75	5	12.5		
3- Classifications						
- Correct	9	22.5	34	85	31.43	0.000**
- Incorrect	31	77.5	6	15		
4- Types						
- Correct	11	27.5	36	90	32.24	0.000**
- Incorrect	29	72.5	4	10		
5- Risk factors						
- Correct	14	30	34	85	20.38	0.000**
- Incorrect	26	70	6	15		
6- Complication						
- Correct	11	27.5	35	87.5	29.46	0.000**
- Incorrect	29	72.5	5	12.5		
7- Drug administration						
- Correct	10	25	36	90	34.58	0.000**
- Incorrect	30	75	4	10		
8- Anti natal follow up						
- Correct	13	32.5	34	85	22.75	0.000**
- Incorrect	27	67.5	6	15		

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(**) highly statistically significant $p < 0.01$

- Table (2) shows highly statistically significant $p < 0.01$ improvement study sample 'knowledge regarding heart disease, 17.5% of the study sample had satisfactory knowledge about definition of heart disease in the pre-intervention and reached 85% in post test . While 25% of the study sample had satisfactory knowledge about drug administration in the pre-intervention and reached 90% in post test

- Figure (1):** Percentage distribution of study sample according to their total Knowledge about heart disease pre- post Self care guidelines There was a significant improvement in total knowledge about heart disease in post- test as compared to pre -test assessment ($p < 0.0001$)

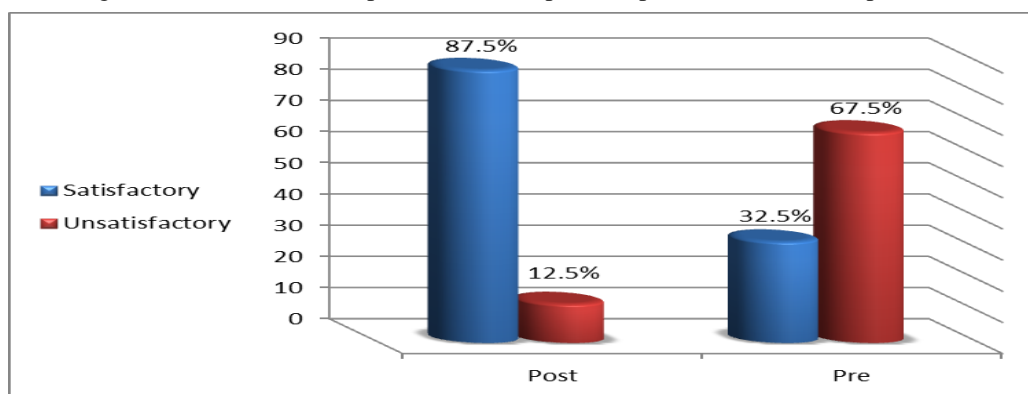


Table (3): The relation between study sample's demographic characteristics and their total knowledge post self care guidelines (N=40)

Demographic Characteristics	Satisfactory		Unsatisfactory		X ²	P
	N	%	N	%		
Age (years):						
<20	7	87.5	1	12.5	1.57	0.72
20 : 30	9	81.8	2	18.2		
30 :40	16	94.1	1	5.9		
40 years& more	3	75	1	25		
Qualification:						
Illiterate	19	90.5	2	9.5	1.1	0.61
Read & write	9	90	1	10		
Secondary school .	7	77.8	2	22.2		
Previous information						
Yes	4	66.7	2	11.1	33.3	2.80
No	31	91.2	3	13.3		
	14	87.5	2	12.5	8.8	

- Table (3)** shows that there was no statistically significant relation between study sample total knowledge and their ages, qualifications, & there was no statistically significant relation between study sample total knowledge and they have previous information from following up on pregnancy

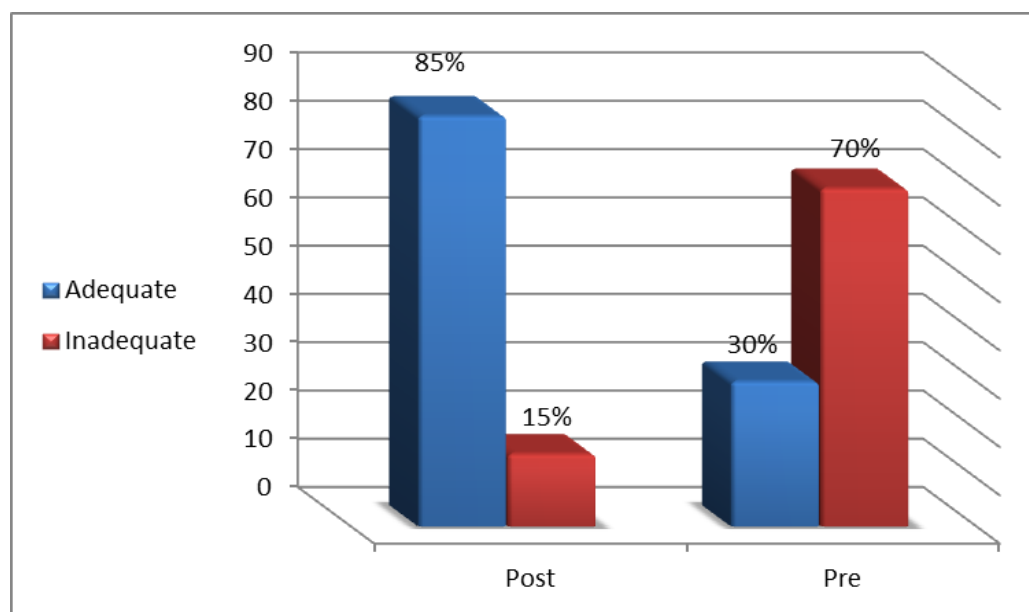
Table (4) Distribution of study sample according to their practice as reported by study sample suffering from heart disease pre/post self care guidelines

Items	Pre		Post		X ²	P
	No	%	No	%		
Diet	Adequate	12	30	34	85	24.76 0.000**
	Inadequate	28	70	6	15	
Exercise	Adequate	9	22.5	35	87.5	34.14 0.000**
	Inadequate	31	77.5	5	12.5	
sexual activity	Adequate	6	15	35	87.5	42.10 0.000**
	Inadequate	34	85	5	12.5	
dangerous signs	Adequate	16	40	34	85	17.28 0.000**
	Inadequate	24	60	6	15	

(**) Highly statistical significant $p < 0.05$

Table (4) shows that Highly statistical significant $p < 0.0$ improvement 40% of the study sample had adequate practice about dangerous signs in the pre-intervention and reached 85% & 77.5% in post and follows up respectively

Figure (2): Percentage distribution of study sample according to their total practice pre/post Self care guidelines about heart disease There was a significant improvement in total practice about heart disease in post- test as compared to pre -test assessment ($p < 0.0001$)



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Table (5): The relation between demographic characteristics of study sample and their practice post self care guidelines

Demographic characteristics	Adequate		Inadequate		X ²	P
	N	%	N	%		
Age (years):						
▪ <20 years (n=8)	7	87.5	1	12.5	Fisher	P >0.05
▪ 20 : 30 years (n=11)	9	81.8	2	18.2		
▪ 30 :40 years (n=17)	15	88.2	2	11.8		
▪ >40 years (n=4)	3	75	1	25		
Qualification:						
▪ Illiterate	19	90.5	2	9.5	1.06	0.59
▪ Read & write	8	80	2	20		
▪ Secondary school.	7	77.8	2	22.2		
Previous information						
▪ Yes (n=6)	3	50	3	50	Fisher	P >0.05
▪ No (n=34)	31	91.2	3	8.8		

Table (5) shows that there was no statistically significant relation between study sample practice score and their ages, qualifications and previous information. While there were highly statistically significant relation between study sample total practice score and their experience

Table (6) Correlation between study sample total knowledge and their total practice pre/post self care guidelines

Knowledge	Practice			
	Pre		Post	
	R	P	r	P
Pre	0.41	0.046*		
Post			0.86	0.001*

Table (6) shows that there was statistically significant relation between study sample and their practice throughout the intervention phases.

Discussion

Care for pregnant women with heart disease requires special care for diagnosis, treatment and continuous follow-up. Conducting a systematic, accurate and realistic assessment of the potential risks of complications for the mother and fetus and the expected negative results, both during pregnancy and postpartum, is vital to the success and safety of pregnancy (Pijuan & Goya, 2015).

In the light of the previous studies, the researcher conducted this study to evaluate the effect of self care guideline for pregnant women suffering from heart disease. Regarding the demographic characteristics of the study sample, the current study revealed that more than half of pregnant from 30-40 years .mean age of study sample **36.3±8.2** and had illiterate. Nearly three quarters of them living in rural area, and less than one fifth of them they have previous knowledge

regarding heart disease during antenatal care during pregnancy before.

These findings agree with **El-Sabah & Zaiton (2013)** who found that the mean age of the women was **36.3±8.2** years. Concerning study sample " level of education, it was noticed that more than half of women are illiterate and nearly two thirds of them hadn't receiving any previous knowledge regarding heart disease during pregnancy before.

These findings may be attributed that specific information regarding heart diseases was ignored from some administrators which affect health care negatively.

Regarding the receiving previous knowledge about heart disease during pregnancy, these results indicated that more than two thirds of study sample hadn't receiving any knowledge regarding heart disease during pregnancy before which made most of the pregnant had knowledge deficit concerning management of pregnant women suffering from heart disease while there were significant improvement after implementing self-care guideline, This result disagree with **Hussein & Al-Ganmi, (2013)** in their study done in Baghdad they revealed that one third of study sample only were always receiving knowledge regarding heart disease during pregnancy.

Regarding the distribution of pregnant women's knowledge about heart diseases, the current study revealed that women had poor score of knowledge regarding heart diseases during pregnancy such as its definition, signs and symptoms, classification, and treatment at pre-intervention.

These findings were highly supported by (**Mohammed, 2014**) who reported that

women's knowledge regarding signs & symptoms of heart disease during pregnancy was in adequate and recommended continuous training programs for women, there was a high statistical significant improvement in women's knowledge about heart diseases during pregnancy at post training and follow up phases of the application of the self-care guidelines (p-value < 0.01).

From the researcher's point of view, This may be explained by the fact that these women had lack of receiving enough information about heart diseases during antenatal care during pregnancy from medical staff, especially nurses who may also they had lack of knowledge and awareness and this may due to low educational level of the majority of them and lack of training courses.

The current study revealed that the overall percentage of women's knowledge related to signs and symptoms of heart diseases during pregnancy improved with a highly significant difference after implementing self care guideline. This result may be due to the effect of developed guideline that has enhanced women's knowledge.

These results were supported by **the European Society of Gynecology (2011)**, reporting that, a working knowledge of the normal physiology of pregnancy is often helpful in the management of pregnant women with heart disease, as well as preparation for labour and in order to diagnose and manage common medical problems of pregnancy, such as hypertension, gestational diabetes, anemia and hyperthyroidism

Regarding the distribution of women's knowledge about risk factors of heart

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diseases during pregnancy, the current study revealed that women had poor knowledge related to risk factors of heart diseases during pregnancy before implementing self care guideline, while there was significant improvement at post and follow up phase, These findings agreed with **Perk et al. (2012)**; who reported that women had good knowledge related to cardiovascular disease risk factors and lifestyle modifications.

Regarding the women's knowledge about maternal and fetal complications of heart diseases during pregnancy before and after the implementing the guideline, the overall percentage of knowledge related to maternal and fetal complications of pregnant women with heart diseases was incorrect at pre intervention while there was improvement after implementing nursing care guideline with a highly significant difference. Similarly to **Mohamed (2014)**, reported that approximately one third of study sample had correct knowledge about complication of heart diseases during pregnancy. This goes in line with **Renfrew et al. (2014)**, who clarified that the improvements can be gained by educating women with adverse pregnancy outcomes. Several ways to educate women are to attend continuous educational courses about heart disease during pregnancy and to have referral sources so they can easily refer pregnant women for health care needs. Also, a renewal contents should be added to the curriculum for nurses, nurse practitioners, and nurse midwives“ who provide prenatal care.

The current study revealed that there was a highly statistically significant improvement in knowledge of pregnant women related to management of heart

disease during pregnancy after implementing self care guideline. Similarly to **Emmanuel (2015)**, who illustrated that Pregnancy makes a significant demand on the cardiovascular system. Therefore, it follows those women with cardiovascular compromise due to cardiac disease need specialist input and careful management pre-, pre & post-partum.

Also, this finding agreed with **El-Sabah & Zaiton (2013)** reported that more than half of women recognizing the management of pregnant women with cardiac disease pre-intervention and reached to three quarters after intervention program, also they had correct knowledge regarding care of pregnant women with heart disease throughout the intervention phases.

Regarding the total knowledge; the current study revealed significant improvement in total women's knowledge regarding care of pregnant women with heart diseases at post and follow up phase as compared to pre intervention. These results agreed with **El-Sabah & Zaiton (2013)**, stated that general women's knowledge regarding management of pregnant women suffering from heart diseases was improved after conducting the training program.

A Similar study conducted by **Eman and Hala, (2013)**, stated that there was a highly statistically significant improvement in knowledge of women related to management of heart disease during pregnancy after an educational program.

Another study conducted by **Mahramus, (2014)**, found that there was a recognized improvement in women's knowledge regarding heart diseases after applying an educational program. Moreover,

the study revealed a significant improvement in post test score. This result was in agreement with **Garris, (2014)**, who indicated that providing heart disease educational classes for women can be successfully increases women's knowledge therefore; the implemented educational program was effective and had an impact on women's knowledge about management of women with heart disease.

From the researcher's point of view, Nursing should be given an educational program on heart disease and how to reduce complications associated with pregnancy in order to give women the necessary health assessment during pregnancy follow-up visits and explain how to communicate and follow up when any complications occur or counseling regarding that.

Regarding the relation between the total knowledge score and personal characteristic, the current study findings represented that there was no a statistically significant relation between women's knowledge and their ages, and educational level.

These findings agree with, **Parajulee (2011)** who reported that there was no significant relation between the total knowledge score and the age of the women. This may be due to the mean age of women in this study ranged from thirty to thirty six and level of education was bachelorette which helped women to acquire adequate knowledge While **Parajulee (2011)** reported that the mean age of study sample was ranged from twenty to twenty nine and women's educational level were diploma that made them be un knowledgeable On contrast, with **Abd-Allah et al. (2017)** who found that, there was a statistically significant relation

between the level of education and knowledge.

From the researcher's point of view, this result may be attributed to the fact that the knowledge of women is not affected by educational level and age. Others. She receives knowledge and health assessment at any age and is not related to education

Our study revealed a pregnant woman's understanding of adequate health information about heart disease, the distinction between cardiovascular symptoms, knowledge of symptoms and complications that can occur and how they behave, and has a plan of what to do and places to contact and go to when needed (referral)

Regarding the relation between the total knowledge score and receiving knowledge during attending in anti natal care about heart disease during pregnancy before, the current study revealed that there was no statistically significant relation between women's total knowledge and receiving knowledge regarding heart disease during pregnancy before These findings disagreed with **Mohammed et al. (2018)** recorded that there was a highly statically significant relation between total knowledge score of the studied women and previous receiving educational class for women. Also, **Mukona & Munjanja, (2016)** indicated that receiving educational class for women is one of the factors of improving women's knowledge regarding care of pregnant women.

From the researcher's point of view, this may be because this information was not related to heart disease during pregnancy and needs a specialized health team and has sufficient information about heart disease and how to avoid complications.

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Health education is known to be an integral part of nursing care, because primary care providers are positioning close contacts in the hospital in an ideal position to provide education on risk factors for cardiovascular disease and advise patients to make lifestyle adjustments (**Abernathy, 2018**). Those who work in outpatient clinics and follow up on pregnant women should assess the risk factors for heart disease and carry out activity to provide awareness of cardiovascular disease with a focus on preventive measures for their patients (**Ding, 2017**)

Many women felt that they received supportive care from the health care team, felt grateful and praised the skills and responsiveness of clinicians to them. It also mentioned the feeling of safety when making profit knowledge about healthy diet. And Healthy habits know; benefit is greatest in those at increased risk of cardiovascular disease. Behavioral modifications that reduce the risk of cardiovascular disease include: eating a balanced A diet low in saturated fats, salt, and refined carbohydrates (sugar), regular physical activity, maintaining proper body weight, avoiding tobacco smoking, and reducing alcohol consumption, Behavioral risk factor modification is beneficial in primary and secondary prevention of CVD (**Fung et al., 2018**).

Many women felt that they had received supportive care from their healthcare team, were grateful and praised the skills and responsiveness of their clinicians. Also reported feeling 'secure' when gain knowledge about healthy diet. And Healthy habits which as Behavioral modifications that reduce the risk of cardiovascular disease include: eating a balanced diet that is low in

saturated fat, salt, and refined carbohydrates (sugar), undertaking regular physical activity, maintaining appropriate body weight., avoiding tobacco smoking, minimizing the consumption of alcohol, Behavioral risk factor modification is beneficial in primary and secondary prevention of CVD (**Fung et al., 2018**).

Regarding women's practice related to informatics aspect of care as reported by the women, the current study revealed that there was a significant improvement in women's practice related to health education given to pregnant women suffering from heart disease in post and follow up phase as compared to pre intervention. This is due to the effect of nursing care guideline as it positively improved knowledge & practice of the nurses.

These findings agreed with **Perk et al. (2012)** who reported that the significance of reducing cardiovascular disease risk factors and lifestyle modifications had been well recognized internationally, Also The World Health Organization recommends public awareness of healthy lifestyle as a best buy“ to improve cardiovascular disease behaviors (**Alwan, 2011**).

Regarding the total practice of study sample related to pregnant women suffering from heart disease; the current study revealed that there was a significant improvement in women's total practice score regarding self-care of pregnant women suffering from heart diseases at post and follow-up post as compared to pre intervention. These results agreed with **Eman& Amira (2018)** who stated that there was a highly significant improvement inwomen's total practice score

related to care of pregnant women of heart disease after an training educational program which made women more knowledgeable and professionally experience

Regarding the relation between study sample , their practice and their demographic characteristics, the current study reported that there was no a statistically significant relation between women's total practice score and their ages, educational level, and receiving knowledge about heart disease during attending anti care during pregnancy before. These findings these results were supported by **Jackson (2012)** who studied improving diet and exercise during pregnancy with video doctor advice. He emphasized that educational intervention improved the practices of women in pregnant women and had a positive impact on increasing experience and higher education

From the researcher's view is that; these results may be due to the fact that the practice of the study sample is not affected with education and age receiving education is not affected by age and experience

Regarding the correlation between women's total knowledge and their total practice score, the current study indicated that there was statistically significant relation between women's total knowledge and their practice throughout the intervention This finding may be due to the fact that women's knowledge and practice are interrelated and affected with the same factor and conditions, from researcher's point of view there is a direct positive relationship between women's knowledge and their practice. This finding agreed with **Eman & Amira (2018)** who reported there were a high positive correlation between total knowledge and total practice score of studied women

In addition to **Mokhtari et al. (2011)** proved the positive relationship between women's knowledge and practice. Also, in the study by **Davies & Madden (2008)** reported that the level of knowledge and skill of women increased following training program. Moreover, the results of the study by **Barimnejad & Rasouli (2009)** in this regard indicated the necessity of retraining and updating of knowledge and awareness and upgrading of the level of knowledge and practice of women.

Conclusion

- Based on the finding of the present study, it can be concluded that:

The findings of present study supported the research hypotheses that, improvement knowledge & practice after implementing the developed nursing care guideline. , highly statistically significant improvement study sample 'knowledge regarding heart disease & highly statistical significant improvement of the study sample had adequate performance ,there was no statistically significant relation between study sample total knowledge and their ages, qualifications, and experience and there was no statistically significant relation between study sample performance score and their ages, qualifications

Recommendations

- **In the light of the results of this study, the following recommendations were suggested:**
- Periodic educational program for pregnant women with heart diseases in obstetrics and gynecology unit in outpatient clinic

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- A simplified and comprehensive booklet should be available for all women suffering from heart disease This booklet should include a clear, brief and simple explanation about non pharmacological modalities to reduce complication
- Research on Effect of developed self-care guideline for home care on pregnant women suffering from heart disease.
- Assessment of the quality of nursing intervention among pregnant women suffering from heart disease.
- Effect of nursing care provided to pregnant women of heart disease on mother satisfaction.

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