Effect of Nursing Care Guideline on Nurses Knowledge and practice about Pregnant Women 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** of the present study is to evaluate the effect of nursing care guidelines for pregnant women suffering from heart disease on nurses' knowledge and practice. **Research design:** A Quasi experimental design was used in carrying out this study. **Setting** at Beni-suef general Hospital & Beni-suef University hospital at (gynecological ward (Inpatient: high-risk ward) & outpatient clinic. **Sample:** A convenient sample of a total 40 maternity nurses was included in the study. **Tools:** Two tools were utilized for data collection. I- A structured interviewing questionnaire sheet, which includes two parts; part 1 socio-demographic characteristic. Part 2: Assessment of nurses' knowledge regarding heart disease during pregnancy which includes definition, causes, risk factors, etc. II- A standard observational checklist to assess nurses' practices regarding heart diseases during pregnancy. **Results** of the current study revealed a statistically significant improvement in nurses' knowledge and practice related to care of pregnant women suffering from heart disease at the post test and follow up. **Conclusion:** implementation of nursing care guideline enhance nurses' knowledge& practices regarding care of pregnant women suffering from heart diseases, so study mainly **recommended** that the educational program for nursing care of pregnant women suffering from heart disease should be conducted periodically for nursing staff in obstetrics and gynecology department

Key words: Heart diseases, Pregnancy, Nursing care guideline, Nurse, Knowledge, Practice.

Introduction

Heart disease continues to be the leading cause of non-obstetric maternal morbidity and mortality. Early diagnosis and appropriate care can lead to prevention of complications and improvement of pregnancy outcome (**Uri, et al., 2016**). Despite advances in the management of maternal cardiovascular diseases, heart disease during pregnancy accounts for as much as one-third of the maternal mortality. *(Appelman, et al, 2015)*

Heart diseases are a group of disorders of the heart and blood, a structural or functional abnormality of the heart blood, or of the blood vessels supplying the heart, that impairs its normal functioning. Heart disease encompasses a number of different conditions, including congenital heart defects (birth defects), coronary artery disease or atherosclerosis of the coronary arteries, abnormal heartbeats known as arrhythmias, or diseases of the heart muscle *(**Sweeney, 2018**).*

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

According to **World Wide Organization, (2016),** Cardiac diseases are classified depending on functional status into: A) class I; Uncompromised (no limitation of physical activity): These women do not have symptoms of cardiac insufficiency or experience anginal pain, B) Class II; Slight limitation of physical activity: These women are comfortable at rest, but if ordinary physical activity is undertaken, discomfort results in the form of excessive fatigue, palpitation, dyspnea, or anginal pain, C) Class III; Marked limitation of physical activity: These women are comfortable at rest, but less than ordinary activity causes excessive, palpitation, dyspnea, or anginal pain, and D) Class IV; Severely compromised (inability to perform any physical activity without discomfort): Symptoms of cardiac insufficiency or angina may develop even at rest, and if any physical activity is undertaken, discomfort is increased fatigue

Bhatt & Yeh, 2015 added that there are various complication 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 sever in cases of lesions associated with cyanosis in the mothers), neonatal asphyxia, respiratory distress syndrome and fetal or neonatal death Furthermore; evaluation of patients for underlying heart disease in order to promote optimal care during pregnancy that plays a major role in the outcomes.

The major goal of nursing care for the pregnant women and her family when heart diseases complicates the pregnancy is prevention of complications that may occur from cardiac condition through a comprehensive assessment to identify individual needs for teaching, emotional support, and physical care *(McKinney, et al., 2017)*.

This is accomplished by education of the women and husband; assessment of all systems involved on a routine basis; referral to appropriate nursing, nutritional, social and medical experts; and facilitation of patient participation in decisions *(Butcher et al., 2018)*.

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** per cent 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 was **9.3**% in Egypt *(Soliman et al., 2016)*. 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 management of pregnant woman with heart diseases is a challenge for obstetrician. Factors contributing in delaying the actions toward decreasing risks and sequalae of disease are lack of awareness related to importance of antenatal follow up among lay people, limited roles of nurses in the antenatal clinics, absence of cooperation language between different specialties as well as lack of facilities to communicate them easily in the governmental hospitals. Till now, it is noticed that, the studies conducted in Egypt discussed the cardiac disease during pregnancy from a medical view of point *(Ghani, et al., 2010)*.

Aim of the study

The aim of this study is to evaluate the effect of nursing care guidelines for pregnant women suffering from heart disease on nurses' knowledge and practice through:

• Assessment of nurses' knowledge & practice regarding care of pregnant women suffering from heart disease.

• Developing & implementing nursing care guideline regarding care of pregnant women suffering from heart disease.

• Evaluate effect of developed nursing care guideline for pregnant women suffering from heart disease on nurses" knowledge and practice

Research hypotheses

Nursing care guideline will improve nurses' knowledge and practice related to care of pregnant women suffering from heart disease.

Subject and methods

Research design:

Quasi experimental research design was used to achieve the aim of the current study.

Setting:

The current study was conducted at Beni-suef general Hospital and Beni-suef University hospital at (gynecological ward (Inpatient: high-risk ward) & outpatient clinic)

Subjects

A convenient sample of forty nurses working at the previously mentioned settings.

Data collection tools

1-Structured Interview Questionnaire Sheet:

It was developed by the researcher based on review of pertinent literature. It aimed to assess the nurses' knowledge regarding care of pregnant women suffering from heart disease. It consisted of two parts:

Part1: Socio-demographic characteristics of the study subjects such as: age, educational level, residence, experience … etc.

Part 2: Nurses' knowledge regarding care of pregnant women suffering from heart disease such as (definition, signs&syptoms, Types, etc...).

Scoring system:

Nurses responses were scored (one) for the correct answer and (zero) for incorrect answer, Total score=9,ranged

from(0-8) Mean and standard deviation was calculated and then converted into percent score. Knowledge percent scores were further divided into knowledge levels as the following:

• Poor (< 60.0%) (Score <5).

• Average (60 % to 75%) (Score 5 to 6).

• Good (>75.0%) (Score >6).

2-Standardized observational checklist:

It was adopted from WHO (2014) and modified by the researcher. It consisted of three main parts as the following:

Part 1: Nurses' practice regarding interpersonal and communicational aspect of care.

Part 2: Nurses' practice regarding technical aspect of care, which includes; **A) Comprehensive assessment** which contains about 1) History taking, 2) physical examination, and 3) Interpretation of lab investigation, **B) Nursing care** according to women needs

Part 3: Nurses' practice regarding informatics aspect of care, which includes health education about; 1) Diet, 2) Daily activities, 3) Sexual Activity, and 4) Danger signs during pregnancy.

Scoring system:

Nurses' practice was scored (one) for the "done" observations and (zero) for "not done" observations, ranged from (0-62), Mean and standard deviation was calculated and then converted into percent score. practice percent scores were further divided into practice levels as the following;

• Satisfactory (≥ 75.0%) (Score ≥ 47).

• Unsatisfactory (<75.0%) (Score < 47).

Tools Validity:

Face and content validity of the study tools was assessed by jury group consisted of Five experts in maternity and gynecological nursing department of faculty of nursing, Ain-shams university for comprehensiveness, accuracy and clarity in language.

Tools Reliability:

Table (1): Reliability coefficient of the study tools:

Questionnaire Dimensions	No. of items	Cronbach Alpha
The structured interview questionnaire.	9 items	0.783
The standardized observation checklist.	62 items	0.815
Nurses' opinionnaire sheet	15 items	0.901
Experts' opinionnaire sheet	12 items	0.862

Operational Design:

Preparatory phase:

This phase started with a review of current and past, national and international related literature concerning the subjects of the study, using textbooks, articles, journals, and websites. This review was helpful to the researcher in reviewing and developing the 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.

Pilot study:

Pilot study was carried out on 10% of the total study sample (four nurses) to evaluate the applicability, efficiency, 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.

Field work:

Data collection of the study was started at the beginning of May 2018, and completed by the end of September 2018. (Five months)

Phase 1:

• The researcher attended at Beni-suef general Hospital (gynecological ward: in patient high risk ward and outpatient clinic) two days per week from 9am to 2pm and two day per week in Beni-suef university hospital (gynecological ward: inpatient high risk ward and outpatient clinic) from 9am to 2pm. The researcher introduced herself to nurses, explained the aim of the study and its implications on the clinical field, and ensures their cooperation. Then oral consent of nurses was obtained.

• The researcher started to fill the interview questionnaire sheet to assess nurses' socio-demographic characteristics, their knowledge regarding heart disease during pregnancy and document all the data in the questionnaire sheet and ensure confidentiality of data. It took from 10 to 15 minutes.

• The researcher observed nurses' practice during care of pregnant women suffering from heart disease by observing nurses in their departments during ordinary work. Each observation checklist was given a code number. The observation was taken within 10 to 20 minutes. This phase took two weeks.

Phase 2:

Supportive material (Arabic educational booklet):

It was 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** contained knowledge about heart disease e.g. (Definition of heart disease during pregnancy, sings, symptoms, causes, types, and medical treatment. **Part 2** nursing care guideline(observational checklist) which divided in to **three main categories ;** the **first one** concerned with Interpersonal and communicational aspect of care, the **second** concerned with Technical aspect of care which contains 1)comprehensive assessment of nurses' practice through; (A) History taking, (B) physical examination which divided into two parts; general examination and local examination, (C) Interpretation of lab investigation, 2)Nursing care according to women need, while **third category** includes informatics aspect of care regarding diet, exercise, sexual activity, and danger signs during pregnancy.

• The developed nursing care guidelines were implemented in the training halls at the study settings.

• The researcher started to explain the nursing care guideline for the nurses (Arabic Educational booklet) in the form

of lectures, each lecture continued for 2 hours, the researcher used power point and video to maintain attention&attraction of nurses   five theoretical sessions and four practical sessions were conducted at each hospital

• Each session was started by a summary about what has been discussed in the previous session and the objectives of the new session, using a simple Arabic language, also the session ended by a summary of its content and feedback from the nurses to ensure that the nurses got the maximum benefits. The researcher also communicated with nurses' via telephone call or E-mail for instruction and reinforcement. The implementation phase took six weeks

• Session 1, the researcher explained the aim of the study, objectives ,plan, and content of the developed guideline

• Session 2 contained explanation of   concept of heart disease during pregnancy, causes and risk factors, ,

• Session 3 stressed on illustration of different types of heart disease during pregnancy

• Session 4 the researcher differentiates between effect of pregnancy on heart disease and effect of heart disease on pregnancy.

• Session 5 summarized medical treatment of heart disease during pregnancy.

• Session 6 which concluded practical procedure through which the researcher used video to facilitate understanding and application. It includes nursing   care procedures for pregnant women suffering from heart disease such as: performing

comprehensive assessment through history taking and maintaining aseptic technique,administing medication, withdrawal of blood sampling, general examination, assessment of weight and height,

• Session 7 included Local examination such as abdominal examination, genital examination; examination of extremities, Assessment of pitting edema and urine analysis

• Session 8 the researcher applied on ECG and CTG machine

• Session 9 the researcher made application on all procedures using role play, scenarios and other methods of teaching.

Phase 3: Evaluation phase:

• After implementing the developed guideline about nursing care of pregnant women with heart disease, evaluation of nurses' knowledge and performance was done immediately, then after three months using the same data collection tools used at the   phase 1 for measuring knowledge and practice of nurses and determine the effect of nursing care guideline .Then the researcher evaluate the Nurses satisfaction through oppoinionnaire sheet. Evaluation phase completed by the end of September 2018.

Administrative Design:

An official letter requesting permission to conduct the study was directed from the dean of the faculty of nursing Ain-Shams University to Beni-Suef university hospital and Beni-Suef general hospital directors and the nursing 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.

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 reassured about the anonymity and confidentiality of the collected data, which was used only for the purpose of scientific research. The subjects' right to withdraw from the study at any time was assured.

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's 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) revealed that, 42.5% of the study sample had from thirty to forty years and had diploma in nursing. 72.5% of them living in rural area, and 57.5% had more than ten year experience, 15% of them attended training course regarding heart diseases during pregnancy.

Table (2) shows significant improvement in nurses' knowledge regarding heart disease, 17.5% of the study sample had correct knowledge about definition of heart disease in the pre-intervention and reached 85% &77.5% in post and follow up respectively. While 32.5% of the study sample had correct knowledge about nursing management in the pre-intervention and reached 85% &77.5% in post and follow up respectively

Figure (1) shows significant improvement in total nurses' knowledge regarding care of pregnant women with heart disease, 32.5% of the study sample had good knowledge in the pre-intervention as compared to post and follow up 87.5% & 75% respectively.

Table (3) shows significant improvement in nurses' practice regarding interpersonal and communicational aspect of care, 25% of the study sample had satisfactory practice about encouraging the mother to express her feeling in the pre-intervention and reached 90% &82.5% in post and follow up respectively. While 57.5% of the study sample had satisfactory practice about welcoming the women and introduce yourself in the pre-intervention and reached 85% &77.5% in post and follow up respectively

Table (4) shows significant improvement in nurses' practice of comprehensive assessment, 15% of the study sample had satisfactory practice about measuring level of fundus in the pre-intervention and reached 87.5% & 77.5% in post and follow up respectively. While 55% of the study sample had satisfactory practice about assessing weight and height in the pre-intervention and reached 87.5% & 80% in post and follow up respectively

Table (5) shows significant improvement in nurses' practice regarding information aspects, 30% of the study sample had satisfactory practice about instructing client to monitor her weight at home periodically in the pre-intervention and reached 85% & 77.5% in post and follow up respectively. While 62.5% of the study sample had satisfactory practice about maintaining fluids intake in the pre-intervention and reached 92.5% & 85% in post and follow up respectively.

Table (6) shows significant improvement in nurses' practice regarding main categories, 12.5% of the study sample had satisfactory practice about diagnostic studies in the pre-intervention and reached 90% & 82.5% in post and follow up respectively. While 40% of the study sample had satisfactory practice about dangerous signs in the pre-intervention and reached 85% & 77.5% in post and follow up respectively.

Figure (2) shows significant improvement in total nurses' practice regarding care of pregnant women with heart disease, 30% of the study sample had satisfactory practice in the pre-intervention as compared to post and follow up 84% & 78% respectively. .

Table (7) shows that there was statistically significant relation between nurses' total knowledge and their practice throughout the intervention phases.

Table (1): Demographic characteristics of the study sample (n=40).

Demographic characteristics	No	%
1-Age (years):		
• <20 years	8	20
• 20: 30 years	11	27.5
• 30:40 years	17	42.5
• >40 years	4	10
Mean ± SD	**36.3±8.2**	
2- **Qualification:**		
• Diploma in nursing	21	52.5
• Technical institute	10	25
• Bachelorette degree in nursing	9	22.5
3- **Residence:**		
• Rural	29	72.5
• Urban	11	27.5
4- **Experience: (years)**		
• Less than 5 y	7	17.5
• 5-10	10	25
• +10	23	57.5
5- **Attending training courses** regarding heart disease during pregnancy:		
• Yes	6	**15**
• No	34	**85**

Table (2): Percentage distribution of study sample according to their knowledge about heart diseases (n=40)

Items	Pre No	Pre %	Post No	Post %	Follow up No	Follow up %	X^2	P
Definition								
Correct	7	17.5	34	85	31	77.5	31.5	.000*
Incorrect	33	82.5	6	15	9	22.5		
Symptoms								
Correct	10	25	35	87.5	32	80	18.3	.000*
Incorrect	30	75	5	12.5	8	20		
Classifications								
Correct	9	22.5	34	85	32	80	21.1	.000**
Incorrect	31	77.5	6	15	8	20		
Types								
Correct	11	27.5	36	90	32	80	30	.000**
Incorrect	29	72.5	4	10	8	20		
Risk factors						+		
Correct	14	30	34	85	31	77.5	18.4	.000**
Incorrect	26	70	6	15	9	22.5		
Complication								
Correct	11	27.5	35	87.5	34	85	23.4	.000**
Incorrect	29	72.5	5	12.5	6	15		
Medical management								
Correct	10	25	36	90	30	75	20.3	.000**
Incorrect	30	75	4	10	10	25		
Nursing management								
Correct	13	32.5	34	85	31	77.5	32.1	.000**
Incorrect	27	67.5	6	15	9	22.5		

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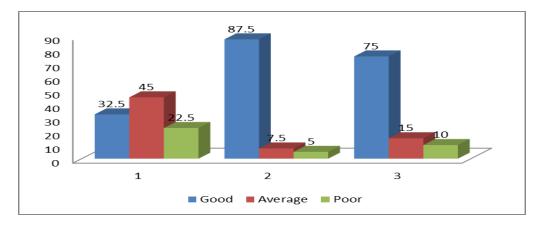

Fig. (1): Percentage distribution of nurse according to their total knowledge

Table (3): Percentage distribution of nurses' practice regarding interpersonal & communicational aspect of care:

Interpersonal & communicational aspect of care:	Pre		Post		Follow up	
	N	%	N	%	N	%
• Welcome the women and introduce yourself.	23	57.5	34	85	31	77.5
• Provide psychological support.	12	30	35	87.5	32	80
• Keep privacy to the woman.	19	47.5	33	82.5	31	77.5
• Provide orientation of the place to the woman.	11	27.5	34	85	32	80
• Encourage the mother to express her feeling.	10	25	36	90	33	82.5
• Be an active listener to the woman.	14	35	35	87.5	31	77.5
• Be a great communicator to the woman.	14	35	35	87.5	32	80
• Encourage the mother to talk freely and build trust between herself and the mother	13	32.5	34	85	32	80
• Let the woman to talk more than listen and use of body language sometimes.	15	37.5	33	82.5	30	75
• Consider of the woman culture, traditions and socio-demographic status	17	42.5	34	85	32	80
• Practice a calm approach/tone.	16	40	35	87.5	30	75

Table (4): Percentage distribution of nurses' practice regarding comprehensive assessment:

Perform comprehensive assessment	Pre		Post		Follow up	
	N	%	N	%	N	%
1.　History taking						
Personal, family, medical, menstrual, and obstetrical history.	14	35	34	85	30	75
2.　Physical Examination:						
A-General examination:						
1.　Take vital signs as T P R BP.	14	35	33	82.5	30	75
2.　Assessment from head to toes to detect any abnormalities.	11	27.5	34	85	31	77.5
3.　Assess weight & height.	22	55	35	87.5	32	80
B-Local Examination:						
1- Abdomen Examination: to						
• Inspect for Line nigra & stria gravidarum & hernia Presence of abdominal scar, abdominal edema	7	17.5	34	85	31	77.5
• Measure level of the fundus.	6	15	35	87.5	31	77.5
• Assess lie, position, degree of flexion, engagement, fetal heart rate.	10	25	34	85	30	75
2-Genital examination:-						
• Vaginal discharge (color, odor, amount) & vaginal bleeding or leakage of amniotic fluid.	13	32.5	35	87.5	32	80
C- Nursing care according to women needs						
1.　Explain Procedure to women.	14	35	34	85	30	75
2.　Wash hands before and after any procedure.	21	52.5	35	87.5	33	82.5
3.　Prepare Equipment.	19	47.5	33	82.5	31	77.5
4.　Wear Gloves.	27	65	36	90	33	82.5
5.　Establishing and maintaining a sterile field.	17	42.5	38	95	34	85
6.　Administer medications as order	12	30	34	85	30	75

Table (5): *Percentage distribution of nurses' practice regarding information aspect*

Information aspect	Pre		Post		Follow up	
	N	%	N	%	N	%
1- Health Education about Diet:						
A. Salt (sodium chloride):						
• Restrict to less than 5 grams (1 teaspoon) per day	13	32.5	35	87.5	32	80
• Reduce salt when cooking, limit processed and fast foods	14	35	34	85	32	80
• Replace other meat with chicken (without skin)	21	52.5	34	85	31	77.5
B. Maintain fluid intake	25	62.5	37	92.5	34	85
C. Recommend limiting caffeine as appropriate	15	37.5	36	90	33	82.5
D. Instruct client to monitor her weight at home periodically	12	30	34	85	31	77.5
2- Daily Living Activities:						
• Usual daily activity done but without overloaded.	13	32.5	34	85	32	80
• Stop the activity if develop a rapid or irregular heartbeat	21	52.5	35	78.5	31	77.5
• instruct client to elevate legs when sitting down	24	60	35	78.5	32	80
3- Sexual Activity:						
• Limit of sexual activity due to increase of heart activity overload.	14	35	34	85	31	77.5
4- Danger signs during pregnancy:						
• Backache, which usually will be in her lower back.	17	42.5	36	90	33	82.5
• Involuntary Shivering	15	37.5	33	82.5	31	77.5
• Symptoms such as nausea, vomiting, or diarrhea	22	55	37	92.5	33	82.5

Table (6): Percentage distribution of study subjects according to their practice regarding the main categories parts(N=40)

Part I		Pre N	%	Post N	%	Follow N	%	P
Interpersonal & Communicational aspect of care:	Satisfactory	10	25	34	85	32	80	.000**
	Unsatisfactory	30	75	6	15	8	20	
Technical aspect of care: part II								
Comprehensive assessment	Satisfactory	8	20	35	87.5	31	77.5	.003*
	Unsatisfactory	32	80	5	12.5	9	22.5	
Physical examination	Satisfactory	11	27.5	33	82.5	32	80	.004*
	Unsatisfactory	19	72.5	7	17.5	8	20	
Diagnostic studies	Satisfactory	5	12.5	36	90	33	82.5	.011*
	Unsatisfactory	34	85	4	10	7	17.5	.011*
Nursing care according to women needs	Satisfactory	12	30	35	87.5	32	80	.011*
	Unsatisfactory	28	70	5	12.5	8	20	
Informatics aspect of care part III								
Diet	Satisfactory	12	30	34	85	30	75	.030*
	Unsatisfactory	28	70	6	15	10	25	
Exercise	Satisfactory	9	22.5	35	87.5	32	80	.005*
	Unsatisfactory	31	77.5	5	12.5	8	20	
sexual activity	Satisfactory	6	15	35	87.5	33	82.5	.000**
	Unsatisfactory	34	85	5	12.5	7	17.5	
dangerous signs	Satisfactory	16	40	34	85	31	77.5	.000**
	Unsatisfactory	24	60	6	15	9	22.5	

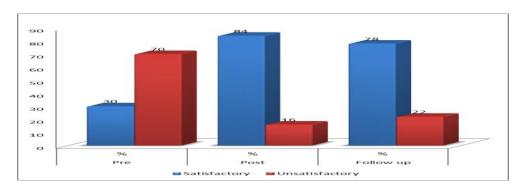(*) statistically significant p < 0.05   (**) Highly statistically significant p < 0.01

Fig. (2): *Percentage distribution of nurse according to their total practice*

Table (7): *Correlation between nurses' total knowledge and their total practice score*

Knowledge	practice					
	Pre		Post		Follow up	
	R	P	r	P	R	p
Pre	.41	.046*				
Post			.86	.001*		
Follow up					.85	.003*

Discussion

The care of pregnant women with heart disease requires special attention to diagnostics, treatment and continuous follow-up. Conducting a systematic, accurate and realistic risk assessment for potential maternal and fetal complications and anticipated adverse outcomes, both during pregnancy and postpartum, is vital to the success and safety of the pregnancy *(Pijuan, 2015).*

Nurses play an integral role in the healthcare system. The nurse is often in the best position to advocate for the patient and coordinate the multidisciplinary team. Early diagnoses, follow up and counseling are keys for reducing morbidity and mortality and this strategy requires collaboration between obstetrician, cardiologists and nurses *(McDonough, 2011).*

In the light of the previous studies, the researcher conducted this study for evaluating the effect of nursing care guideline for pregnant women suffering from heart disease.

Regarding the demographic characteristics of the study subject, the current study revealed that more than half of study sample had more than forty years and had diploma in nursing. Nearly three quarters of them living in rural area, and more than half of them had more than ten year experience, less than one fifth of them attended training course regarding heart diseases during pregnancy. These findings may be attributed that specific training was ignored or forgotten from some administrators which affect health care negatively.

Similar demographics were reported by *El-Sabah (2013),* who found that the mean age of the nurses was 32.37± 6.289 years. Concerning nurses'

level of education, it was noticed that more than half of nurses had Diploma in nursing, more than 5 years of experience, and nearly two thirds of them hadn't attended any training courses.

Regarding attendance of nurses to training courses, these results indicated that more than two thirds of study sample hadn't attended training courses related to heart disease which makes most of the nurses had knowledge deficit concerning management of patient with heart disease while there were significant improvement after nursing care guideline, This result come along with *Hussein (2013),* in their study was done in Baghdad they reveals that one third of study sample only were always participating in training courses.

On the other hand *Sollie (2014)* indicated that the majority of the studied nurses' ages ranged from 20 to 30 years and had less than five years of experience. Also *Jackson (2012),* reported that more than one third of the participants had Bachelor degree in nursing and less than half of them living in rural area.

Regarding distribution of nurses' knowledge about pregnant women suffering from heart diseases, the current study revealed that nurses had low score of knowledge regarding heart diseases during pregnancy such as its definition, signs and symptoms, classification, treatment, and nursing role at pre-intervention. This may be explained by the fact that these nurses didn't receive enough information about heart diseases during pregnancy, also it may be due to lack of knowledge and awareness of nurses and low level of education of the majority of nurses as the majority of them were diploma nurses.

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

reported that nurses' knowledge regarding signs and symptoms of heart disease during pregnancy was in correct and recommended continuous training programs for nurses

However, there was a high statistical significant improvement in nurses' knowledge about heart diseases during pregnancy at post and follow up phases of the application of the care guidelines (p-value < 0.01). This may be due to continous education and enforcment by the researcher through using the educational booklet.

The current study revealed that the overall percentage of knowledge of nurses related to signs and syptoms of heart disease during pregnancy improved with a highly significant difference after the implementing the guideline. This result may be due to the effect of training programs that has enhanced nurses' knowledge.

These results were supported by **the European Society of Gynecology (2011),** reported that, a working knowledge of the normal physiology of pregnancy is often helpful in the management of patients 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 hyperthyroidis.

Another study conducted by **Kovacs et al. (2008),** who noticed that the obstetric nurses must be have adequate knowledge related to physiological changes of cardiovascular system during pregnancy.

Regarding distribution of nurses knowledge about risk factors of heart disease during pregnancy, the current study revealed that nurses had incorrect knowledge related to risk factors of heart disease during pregnancy before implementing nursing care guideline, while there were significant improvement at post and follow up phase, These findings agreed with **Perk et al. (HYPERLINK "https://onlinelibrary.wiley.com/doi/full/ 10.1111/jocn.13678"2012),** who reported that nurses had correct knowledge related to cardiovascular disease risk factors and lifestyle modifications,

Regarding nurses' knowledge about maternal and fetal complications of heart disease 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 disease was incorrect at pre intervention while there was improvement after implementing the guideline with a highly significant difference. Similar to **Mohamed (2014)**, reported that approximately one third of study sample who had correct knowledge about to 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 nurses with adverse pregnancy outcomes. Several ways to educate nurses are attending continuing education courses for them about heart disease during pregnancy. Having referral sources so they can easily refer pregnant women for health care needs and content 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 nurse related to management of heart disease during pregnancy after implementing nursing care guidelines. Similar   to

Emmanuel (2015), who illustrated that Pregnancy makes a significant demand on the cardiovascular system Therefore, it follows that women with cardiovascular compromise due to cardiac disease need specialist input and careful management pre-, during-, and post-partum.

This results coincided with **(Mozaffarian,et al,2015)**who stressed that the training program for nurses personal as method for contious updating and renewal of their knowledge and skills to maintain and improve competence

Also, this finding agreed with *El-Sabah (2013)*, who reported that more than half of nurses recognizing the nursing 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.

This result disagreement with a study by **(Beth,2016)**who showed increased heart failure knowledge of nurses after viewing an educational video on heart failure the increase wasn't significant(P=0.277)

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

Similar study conducted by **(Eman and Hala, 2013**) stated that there was a highly statically significant improvement

in knowledge of nurse related to management of heart disease during pregnancy after educational program.

Another study conducted by *Mahramus (2014)*, found that there is recognized improvement in nurses' knowledge regarding heart disease after applying educational program. Moreover the study revealed that a significant improvement in post-test score.

This result was in agreement with *Garris (2014),* who indicated that providing heart disease education classes to nurses can be successful in increasing nurses' knowledge therefore; the implemented educational program was effective and has an impact on nurse's knowledge about management of patients with heart disease.

Regarding distribution of nurses' practice about interpersonal and communicational aspect of care with pregnant women suffering from heart disease, the current study findings revealed that nurses had un satisfactory practice in pre intervention. While their practice was improved in post and follow up phases.

This finding may be due to nurses' overload that has negative impact on nurses' practice and their communication and interpersonal relationship. In the same line, *Valente (2015)* reported that there is little interpersonal communication about pregnancy-related issues, as more than two thirds of respondents reported talking to no one. For those women who did talk to someone, communication with a health professional had the strongest association with accessing services

Also, **Liu, etal** *(2018)* reported lack of communication between the different specialties within governmental hospitals. This put extra pressure upon

nurses in establishing proper contact and communication with patients and their families

Regarding distribution of nurses' practice related to implementing comprehensive assessment, the current study reported that nurses had un satisfactory practice in pre intervention while there were significant improvement in post and follow up period.

These findings may be due to that the audiovisual method that had been used gave the learner the opportunity to experience uncommon scenarios, receive feedback, and perhaps most importantly correct mistakes before they become part of the learner's. In addition gave a chance for learners to apply procedure with any fear or distress, also, it may be attributed to the positive effect of the training sessions on nurses' practice that appeared in the post and follow up intervention phases.

As regards the findings of the current study nurses had un satisfactory practice related to nursing care of pregnant women with heart disease in pre intervention such as (history taking, comprehensive assessment and interpreting lab investigation as ECG & CTG), while there were improvement in the percentages of nurses' practices related to the nursing care of pregnant women suffering from heart disease which include measuring vital signs, assessment of respiratory status and oxygen saturation, ECG monitoring throughout pregnancy at post and follow up phase

These findings in agreement with (**Eman and Hala,2013**) who reported that nurses practices were un satisfactory before training program, while there were significant improvements in the percentages of nurses practice related to

nursing care of pregnant women of heart disease which include measuring vital signs, assessment of respiratory status and oxygen saturation and FCG monitoring through the intervention program, Also(**Sunitha,2014**) stated that electrocardiography(ECG)is a common and useful diagnostic tool throughout pregnancy for complaints such as chest pain/arrhythmias.

These findings similar to (**Mohammed, 2014**) who reported nursing management of pregnant woman with heart disease among nurses un satisfactory in some variable and recommended continues training programs and available log book about care for nurses. Also, it is in agreement with *Surratt (2009)* who emphasized that the obstetric nursing interventions during labor include monitoring the progress of labor, reviewing the nursing chart, performing vaginal examinations, assessing the cardio-topography, infusion oxytocin, providing pain relief, surgical assistance by forceps or ventouse and caesarean section. Obstetric nurses should have the knowledge and practice related pathophysiologic processes to give appropriate interventions.

Moreover, *American College of Obstetricians and Gynecologists (2014)* reported that the primary goal of nursing care for the pregnant woman and her family when cardiac disease complicates the pregnancy is to reduce potential risks of complications using comprehensive assessment which includes history taking, physical examination,etc for pregnant women

Moreover, *Ananth and Basso (2010)* reported that the vast majority of nurses did not perform nursing care for pregnant women with cardiovascular disorder before the training program, while there was significant improvement

in nurses' practice after educational training program

Health education is known to be an integral part of nursing care, as primary care providers, hospital registered nurses (RNs) as direct care providers constantly have close interactions with patients during hospitalization. This close contact places hospital RNs in an ideal position to provide education on cardiovascular disease risk factors and advise patients to make lifestyle modifications **(Abernathy, 2018).**

It is expected that hospital RNs especially those who work in cardiovascular units not only have a heightened awareness of the need to assess the patients' cardiovascular disease risk factors, but also actively provide cardiovascular disease education focusing on preventive measures to their patients.(**Ding, 2017**)

Regarding nurses' practice related to informatics aspect of care, the current study revealed that significant improvement in nurses' practice related to health education given to pregnant women suffering from heart disease in post and follow up period as compared to pre intervention. This is due to effect of nursing care guideline as it is positively improve 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 has 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 , HYPERLINK "https://onlinelibrary.wiley.com/doi/full /10.1111/jocn.13678"2011).**

Regarding total practice of nurses related to pregnant women suffering from heart disease; the current study revealed significant improvement in nurses' total practice score regarding care of pregnant women with heart disease at post and follow up period as compared to pre intervention. These results agreed **(Eman and Amira, 2018)** who stated that there was highly significant improvement in nurses total practice score related to care of pregnant women of heart disease after training educational program which make nurses more knowledgeable and professionally experience

Regarding the correlation between nurses' total knowledge and their total practice score, the current study indicated that there was statistically significant relation between nurses' total knowledge and their practice throughout the intervention

This finding may be due to the fact that nurses' knowledge and practice are interrelated and affected with the same factors and conditions, from researcher point of view there is a direct positive relationship between nurses' knowledge and their practice. This finding agreed with *(***Eman and Amira, 2018)** who reported there were a high positive correlation between total knowledge and total practice score of studied nurses

In addition to *Mokhtari et al., (2011)* proved the positive relationship between nurses' knowledge and practice Also, in the study by *Davies and Madden (2008)* the level of knowledge and skill of nurses increased following training program. Moreover the results of the study by *Barimnejad and 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 nurses.

Conclusion

Based on the finding of the present study, it can be concluded that: The findings of this study supported the research hypotheses that, there was significant improvement in the nurses' total knowledge score and total practice score

Recommendation

In the light of the results of this study, the following recommendations were suggested:-

• The developed nursing care guideline for the pregnant women suffering from heart disease should be applied by the nursing staff at outpatient clinic besides high risk word,

• Periodic educational program for nursing staff in obstetrics and gynecology department regarding nursing care of pregnant women of heart disease

• Prepared booklets about nursing intervention of pregnant women suffering from heart disease should be available to all nurses who work with these cases

• Provision of systematic ,continues supervision to evaluate the nursing practice for these high risk cases to ensure the provision of quality nursing care

Recommended Researches:

• 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.

• Guideline for women of heart disease about safe pregnancy and labor.

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