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)
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 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. 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 disease 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 sequelae 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:**

<table>
<thead>
<tr>
<th>Questionnaire Dimensions</th>
<th>No. of items</th>
<th>Cronbach Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>The structured interview questionnaire.</td>
<td>9 items</td>
<td>0.783</td>
</tr>
<tr>
<td>The standardized observation checklist.</td>
<td>62 items</td>
<td>0.815</td>
</tr>
<tr>
<td>Nurses’ opinionnaire sheet</td>
<td>15 items</td>
<td>0.901</td>
</tr>
<tr>
<td>Experts’ opinionnaire sheet</td>
<td>12 items</td>
<td>0.862</td>
</tr>
</tbody>
</table>

**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 and 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, administering 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 opinionnaire 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 of 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).

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1- Age (years):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• &lt;20 years</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>• 20: 30 years</td>
<td>11</td>
<td>27.5</td>
</tr>
<tr>
<td>• 30:40 years</td>
<td>17</td>
<td>42.5</td>
</tr>
<tr>
<td>• &gt;40 years</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td><strong>Mean ± SD</strong></td>
<td>36.3±8.2</td>
<td></td>
</tr>
<tr>
<td><strong>2- Qualification:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Diploma in nursing</td>
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<td>52.5</td>
</tr>
<tr>
<td>• Technical institute</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>• Bachelorette degree in nursing</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td><strong>3- Residence:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rural</td>
<td>29</td>
<td>72.5</td>
</tr>
<tr>
<td>• Urban</td>
<td>11</td>
<td>27.5</td>
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<tr>
<td>**4- Experience: (years) **</td>
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<tr>
<td>• Less than 5 y</td>
<td>7</td>
<td>17.5</td>
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<tr>
<td>• 5-10</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>• +10</td>
<td>23</td>
<td>57.5</td>
</tr>
<tr>
<td><strong>5- Attending training courses</strong> regarding heart disease during pregnancy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Yes</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>• No</td>
<td>34</td>
<td>85</td>
</tr>
</tbody>
</table>
Table (2): Percentage distribution of study sample according to their knowledge about heart diseases (n=40)

<table>
<thead>
<tr>
<th>Items</th>
<th>No</th>
<th>Pre %</th>
<th>Post %</th>
<th>Follow up %</th>
<th>X²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td></td>
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</tr>
<tr>
<td>Correct</td>
<td>7</td>
<td>17.5</td>
<td>34</td>
<td>85</td>
<td>31.5</td>
<td>.000*</td>
</tr>
<tr>
<td>Incorrect</td>
<td>33</td>
<td>82.5</td>
<td>6</td>
<td>15</td>
<td>9</td>
<td>.000*</td>
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<tr>
<td><strong>Symptoms</strong></td>
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<tr>
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<td>25</td>
<td>35</td>
<td>87.5</td>
<td>32</td>
<td>80</td>
</tr>
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<td>30</td>
<td>75</td>
<td>5</td>
<td>12.5</td>
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<td>22.5</td>
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<td>85</td>
<td>32</td>
<td>80</td>
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<td>77.5</td>
<td>6</td>
<td>15</td>
<td>8</td>
<td>20</td>
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<tr>
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<td>27.5</td>
<td>36</td>
<td>90</td>
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<td>80</td>
</tr>
<tr>
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<td>72.5</td>
<td>4</td>
<td>10</td>
<td>8</td>
<td>20</td>
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<tr>
<td><strong>Risk factors</strong></td>
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<td></td>
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<tr>
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<td>30</td>
<td>34</td>
<td>85</td>
<td>31</td>
<td>77.5</td>
</tr>
<tr>
<td>Incorrect</td>
<td>26</td>
<td>70</td>
<td>6</td>
<td>15</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td><strong>Complication</strong></td>
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<td>35</td>
<td>87.5</td>
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<td>85</td>
</tr>
<tr>
<td>Incorrect</td>
<td>29</td>
<td>72.5</td>
<td>5</td>
<td>12.5</td>
<td>6</td>
<td>15</td>
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<tr>
<td><strong>Medical management</strong></td>
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<td></td>
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<tr>
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<td>75</td>
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<td>85</td>
<td>31</td>
<td>77.5</td>
</tr>
<tr>
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<td>67.5</td>
<td>6</td>
<td>15</td>
<td>9</td>
<td>22.5</td>
</tr>
</tbody>
</table>

(**) 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:

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

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

<table>
<thead>
<tr>
<th>Perform comprehensive assessment</th>
<th>Pre</th>
<th>Post</th>
<th>Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. History taking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal, family, medical, menstrual, and obstetrical history.</td>
<td>14</td>
<td>35</td>
<td>34</td>
</tr>
<tr>
<td><strong>2. Physical Examination:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-General examination:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Take vital signs as T P R BP.</td>
<td>14</td>
<td>35</td>
<td>33</td>
</tr>
<tr>
<td>2. Assessment from head to toes to detect any abnormalities.</td>
<td>11</td>
<td>27.5</td>
<td>34</td>
</tr>
<tr>
<td>3. Assess weight &amp; height.</td>
<td>22</td>
<td>55</td>
<td>35</td>
</tr>
<tr>
<td>B-Local Examination:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1- Abdomen Examination: to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Inspect for Line nigra &amp; stria gravidarum &amp; hernia Presence of abdominal scar, abdominal edema</td>
<td>7</td>
<td>17.5</td>
<td>34</td>
</tr>
<tr>
<td>- Measure level of the fundus.</td>
<td>6</td>
<td>15</td>
<td>35</td>
</tr>
<tr>
<td>- Assess lie, position, degree of flexion, engagement, fetal heart rate.</td>
<td>10</td>
<td>25</td>
<td>34</td>
</tr>
<tr>
<td>2-Genital examination:-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Vaginal discharge (color, odor, amount) &amp; vaginal bleeding or leakage of amniotic fluid.</td>
<td>13</td>
<td>32.5</td>
<td>35</td>
</tr>
<tr>
<td><strong>C- Nursing care according to women needs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Explain Procedure to women.</td>
<td>14</td>
<td>35</td>
<td>34</td>
</tr>
<tr>
<td>2. Wash hands before and after any procedure.</td>
<td>21</td>
<td>52.5</td>
<td>35</td>
</tr>
<tr>
<td>3. Prepare Equipment.</td>
<td>19</td>
<td>47.5</td>
<td>33</td>
</tr>
<tr>
<td>4. Wear Gloves.</td>
<td>27</td>
<td>65</td>
<td>36</td>
</tr>
<tr>
<td>5. Establishing and maintaining a sterile field.</td>
<td>17</td>
<td>42.5</td>
<td>38</td>
</tr>
<tr>
<td>6. Administer medications as order</td>
<td>12</td>
<td>30</td>
<td>34</td>
</tr>
</tbody>
</table>
Table (5): Percentage distribution of nurses’ practice regarding information aspect

<table>
<thead>
<tr>
<th>Information aspect</th>
<th>Pre</th>
<th>Post</th>
<th>Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>1- Health Education about Diet:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Salt (sodium chloride):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Restrict to less than 5 grams (1 teaspoon) per day</td>
<td>13</td>
<td>32.5</td>
<td>35</td>
</tr>
<tr>
<td>• Reduce salt when cooking, limit processed and fast foods</td>
<td>14</td>
<td>35</td>
<td>34</td>
</tr>
<tr>
<td>• Replace other meat with chicken (without skin)</td>
<td>21</td>
<td>52.5</td>
<td>34</td>
</tr>
<tr>
<td>B. Maintain fluid intake</td>
<td>25</td>
<td>62.5</td>
<td>37</td>
</tr>
<tr>
<td>C. Recommend limiting caffeine as appropriate</td>
<td>15</td>
<td>37.5</td>
<td>36</td>
</tr>
<tr>
<td>D. Instruct client to monitor her weight at home periodically</td>
<td>12</td>
<td>30</td>
<td>34</td>
</tr>
<tr>
<td>2- Daily Living Activities:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Usual daily activity done but without overloaded.</td>
<td>13</td>
<td>32.5</td>
<td>34</td>
</tr>
<tr>
<td>• Stop the activity if develop a rapid or irregular heartbeat</td>
<td>21</td>
<td>52.5</td>
<td>35</td>
</tr>
<tr>
<td>• Instruct client to elevate legs when sitting down</td>
<td>24</td>
<td>60</td>
<td>35</td>
</tr>
<tr>
<td>3- Sexual Activity:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Limit of sexual activity due to increase of heart activity overload.</td>
<td>14</td>
<td>35</td>
<td>34</td>
</tr>
<tr>
<td>4- Danger signs during pregnancy:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Backache, which usually will be in her lower back.</td>
<td>17</td>
<td>42.5</td>
<td>36</td>
</tr>
<tr>
<td>• Involuntary Shivering</td>
<td>15</td>
<td>37.5</td>
<td>33</td>
</tr>
<tr>
<td>• Symptoms such as nausea, vomiting, or diarrhea</td>
<td>22</td>
<td>55</td>
<td>37</td>
</tr>
</tbody>
</table>
Table (6): Percentage distribution of study subjects according to their practice regarding the main categories parts (N=40)

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

(*) 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

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Pre</th>
<th>Practice</th>
<th>Post</th>
<th>Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>P</td>
<td></td>
<td>r</td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>.41</td>
<td>.046*</td>
<td>.86</td>
<td>.001*</td>
</tr>
<tr>
<td>Post</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow up</td>
<td>24</td>
<td>60</td>
<td>6</td>
<td>15</td>
</tr>
</tbody>
</table>

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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 to30 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 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 continuous education and enforcement by the researcher through using the educational booklet.

The current study revealed that the overall percentage of knowledge of nurses related to signs and symptoms 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 hyperthyroidism.

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 continuous 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.

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 nurses’ 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 unsatisfactory 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, et al. (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 unsatisfactory 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 unsatisfactory 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 unsatisfactory 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 unsatisfactory 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. (Ding, 2017)

Regarding 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 continuous 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.

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Conflict of interest

No

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Endorsed by the European Society of Gynecology (ESG), the Association for European Paediatric Cardiology (AEPC), and the German Society for Gender Medicine (DGesGM), et al. "ESC Guidelines on the management of cardiovascular diseases during pregnancy: the Task Force on the Management of Cardiovascular Diseases during Pregnancy of the European Society of Cardiology (ESC)." European heart journal 32.24 (2011): 3147-3197.


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