

**How to Cite:**

Harbiy, R. A. E.-K., El-Gawad, N. A. E.-F. A., & Mohamady, S. H. (2022). Nursing educational guideline regarding high alert medication among pregnant women with rheumatic heart diseases. *International Journal of Health Sciences*, 6(S8), 6511–6526. <https://doi.org/10.53730/ijhs.v6nS8.13841>

## **Nursing educational guideline regarding high alert medication among pregnant women with rheumatic heart diseases**

**Rabab Abd El-Khalik Harbiy**

Bachelor of Nursing - Faculty of Nursing – Helwan University – Egypt

**Dr. Neama Abd El-Fattah Abd El-Gawad**

Professor of Maternal and Newborn Health Nursing Faculty of Nursing, Helwan University, Egypt

**Dr. Shaimaa Hassan Mohamady\***

Assistant professor of Maternal and Newborn Health Nursing Faculty of Nursing, Helwan University, Egypt

\*Corresponding author

**Abstract**---Background: Rheumatic heart disease is a condition in which the heart valves have been permanently damaged by rheumatic fever and high-alert medications. medications that are most likely to cause significant harm to the pregnant women, even when used as intended. Aim: This study aimed to evaluate the effect of nursing educational guideline regarding high alert medication for pregnant women suffering from rheumatic heart diseases. Design: A quasi experimental design was used to achieve the aim of the current study one group. Setting: The current study was conducted in the outpatient clinics at obstetrics and Gynecology at Alshohadaa Central Hospital in Menoufia governorate, which belongs to the Ministry of Health and Population-Egypt. Sample: A convenience sample composed of 64 pregnant women among high-alert medication and rheumatic heart disease were included in the study. Tools: Tool 1: Self-Administered Questionnaire consisting of: Socio-demographic characteristics of pregnant women, Obstetrical history, menstrual history and pregnant women knowledge assessment sheet about rheumatic heart disease and high alert medication. Tool 2: Guideline sheet for pregnant women with rheumatic heart diseases & high alert medication. Results: There is statistically significant relation between total knowledge about rheumatic heart diseases and total knowledge about high-alert medications. Conclusion: A highly statistically significant improvement among pregnant women knowledge regarding high alert medication & Rheumatic heart diseases. There was a highly statistically significant relation between pregnant women total knowledge and their age and level

of education post education guideline. Recommendations: Further studies provide adequate training for midwifery nursing staff about rheumatic heart disease and high alert medication .

**Keywords**---nursing guideline, pregnant women, high alert medication, rheumatic heart diseases.

## **Introduction**

Pregnancy is a dynamic process associated with significant physiological changes in the cardiovascular system. Changes are mechanisms that the body has adapted to meet the increased metabolic demands of the mother and fetus and to ensure adequate circulation for fetal growth and development. Insufficient hemodynamic changes can result in maternal and fetal morbidity, as seen in preeclampsia and intrauterine growth retardation.(1). Rheumatic heart disease is a condition in which the utero placental heart valves have been permanently damaged by rheumatic fever. The heart valve damage may start shortly after untreated or under-treated streptococcal infection such as strep throat or scarlet fever. Rheumatic heart disease (RHD) is a life-threatening heart condition which results from damage to heart valves caused by one or several episodes of rheumatic fever, an autoimmune inflammatory reaction to infection with streptococcal bacteria (streptococcal pharyngitis or strep throat). Infections are most common in childhood. Rheumatic fever can occur at any age, but usually occurs in children ages 5 to 15 years old .(2).

Women with rheumatic heart disease, mitral stenosis is the most common heart lesion. When become pregnant, the hypervolemia and increased heart rate can increase the transmittal pressure gradient, leading to increased left atrial volume and pressure. Pressure can be transmitted to the pulmonary vasculature, resulting in pulmonary edema and in severe cases pulmonary hypertension, a significant risk during pregnancy as it can cause right heart failure. Further, the chronically dilated left atrium has a propensity to disrupt the cardiac conducting system and cause supraventricular tachycardia, a detrimental event in patients with mitral stenosis who rely on the atrial kick to augment preload and, in severe cases, experience profound cardiac decompensation (3). Medications classified as high-alert medication (HAM) have a narrow therapeutic index. Drugs with a narrow therapeutic index are dangerous because small changes in dosage or blood drug levels can lead to dose- or blood concentration-dependent critical events. With HAMs, adverse events are persistent, life threatening, permanent, and can lead to disability, the need for hospitalization, or death. Known safe practices can reduce the potential for harm (4). The nursing care focus for the patient with RHD is on providing supportive care and preventing complications. Teaching to prevent recurrence of rheumatic fever is extremely important. Pain and activity Intolerance are priority nursing diagnoses for the patient with rheumatic fever and RHD. Acute Pain Joint and chest pain due to acute inflammation is common. Pain and inflammation may interfere with rest and healing. Administer anti-inflammatory drugs as ordered. Promptly report manifestations of aspirin toxicity, including tinnitus, vomiting, and

gastrointestinal bleeding. Give aspirin and other NSAIDs with food, milk, or antacids to minimize gastric irritation (5).

### **Significance of 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. The World-wide, women comprise two-thirds of rheumatic heart disease (RHD) cases, with RHD commonly detected during childbearing age. In countries where RHD is prevalent, up to 90% of cardiac disease in pregnancy is secondary to RHD . (6). Rheumatic heart disease (RHD) is the most common heart disease of children and adolescents globally , over 33 million people are estimated to have RHD, causing >10 million disability-adjusted life-years lost and 319 000 deaths per year, almost all in low- and middle-income countries. Although a previously neglected cause of maternal and fetal morbidity and mortality, RHD has emerged as a global health priority, particularly in low-income regions where it is the most common cardiac disease during pregnancy.( 7) . 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. In Egypt management of pregnant woman with heart diseases is a challenge for obstetrician. Factors contributing in delaying the actions toward decreasing risks 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 .(8). Till now, is noticed that, the studies conducted in Egypt discussed the rheumatic heart diseases during pregnancy from a medical view a point so , from a prospective nursing point of view this aims to assess nursing educational guideline regarding high alert medication among pregnant women with rheumatic heart diseases.

### **Aim of the Study**

This study aimed to evaluate the effect of nursing educational guideline regarding high alert medication for Pregnant women suffering from rheumatic heart diseases.

### **Research Hypothesis**

- H1- Pregnant women will be adequate knowledge about high alert medication & rheumatic heart diseases.
- H2- Positive effect of educational guideline regarding high alert medication among pregnant women with rheumatic heart disease.

## **Subject and Method**

### **Research Design**

A quasi experimental design was used to achieve the aim of the current study (pre – post test).

### **Setting**

The current study was conducted in the outpatient clinics at obstetrics and Gynecology at Alshohadaa Central Hospital in Menoufia governorate, which belongs to the Ministry of Health and Population-Egypt.

### **Sample**

A convenience sample composed of 64 pregnant women among high-alert medication and rheumatic heart disease were included in the study.

### **Tools for data collection**

Data collected by using two tools:

1<sup>st</sup> Tool : Self-Administered Questionnaire:

It was developed by the researcher based on review of recent literature (9).It was written in simple Arabic language to suit pregnant women level of understanding. It aimed to assess the pregnant women knowledge regarding high alert medication among women suffering from rheumatic heart diseases. It consisted of three parts:

Part I: Socio-demographic characteristics of studied pregnant women including: ( name, age, education level , marital status, duration of marriage and occupation of both couples, number of family member in house).

Part II: Medical history, Obstetrical history, menstrual history and history of current pregnancy & family history.

Part III: Knowledge assessment questionnaire was concerned to:

- This part was concerned with assessment of the pregnant women knowledge regarding rheumatic heart disease such as: Nor mal physiological change of cardiovascular system during pregnancy, causes, risk factors, clinical picture and maternal & fetal complication & prevention of complication from rheumatic heart disease for pregnant women (pre –post test) designed by the researcher.
- To assess of the pregnant women knowledge about high alert medication (pre – post test), such as: (antibiotics, anti-inflammatory drugs and diuretics , anticoagulation , antirheumatic drug) designed by the researcher.

### **Scoring system**

A scoring system was followed to assess the pregnant women knowledge regarding rheumatic heart disease and high alert medication . The questionnaire was consisted of 35 question, the total scores of the questionnaire were 70 grades, the correct answer was scored as two (2), the incomplete answer was

scored one (1) and the incorrect or no answer was scored zero (0). These scores were summed and converted into a percentage score.

### **Total percentage for pregnant women knowledge**

- Satisfactory knowledge if score  $\geq 75\%$
- Unsatisfactory knowledge if score  $< 75\%$

### **Tool (II): Guideline sheet for pregnant women with rheumatic heart diseases & high alert medication. Appendix (II)**

This tool was used to assess the effect of the nursing education guidelines for pregnant women with rheumatic heart diseases & high alert medication (pre - post test).

### **Validity**

Validity of the study tools was assessed by jury group of five experts in maternal and gynecological nursing department of faculty of nursing, Helwan University to test comprehensiveness, accuracy and clarity of the tools.

### **Reliability**

Reliability of the tools was tested using a Cronbach's Alpha test and it was (85%) used to determine the internal reliability of the tool.

### **Ethical considerations**

The research approval was obtained from the scientific research ethical committee of the Faculty of Nursing-Helwan University before starting the study. The researcher clarified the aim of the study to each pregnant women included in the study before starting, an approval was obtained from the pregnant women before inclusion in the study, the researcher assured maintaining anonymity and confidentiality of pregnant women data included in the study that it would be used for the research purpose only. The pregnant women informed that are allowed to choose to participate or not in the study and have the right to withdraw from the study at any time without giving any reasons.

### **Pilot study**

Pilot study was carried out of the study sample( 6 pregnant women) with rheumatic heart diseases & high alert medication 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

- The actual fieldwork started of data collection of the study was 6 months period starting from the first of June 2021, and completed by the end of December 2021.
- -The data collection through the interview questionnaire with each Pregnant women individually the first part to data collection about Socio-demographic characteristic, the second part health history of pregnant women this questionnaire sheet and ensure the confidentiality of the data. It took from 25-30 minutes pre educational guideline.
- the researcher attended two days per week from 9am to 2pm. The researcher introduced herself to Pregnant women, explained the aim of the study.
- The researcher started to explain the nursing care guideline for the pregnant women through of (Arabic Educational booklet) in the form of session , All session continued for 2 hours, the researcher used power point presentation and video to maintain attention & attraction of pregnant women three theoretical sessions divided to :Session (1): this session the pregnant women should be knowledgeable about rheumatic heart diseases within 45-60 minutes , session(2): this session the pregnant women should be knowledgeable about high alert medication range between 25-30 minutes . session ( 3 ) : educational nursing guidelines and give health education for pregnant women with rheumatic heart diseases & high alert medication within 25-30 minutes were conducted at hospital .

### Statistical Design

Data collected from the studied sample was revised, coded and entered using PC. Computerized data entry and statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 20. Data were presented using descriptive statistics in the form of frequencies and percentages and measured standard deviations for quantitative variables. Chi-square test (SD) was used for comparison. Statistical significant was considered at  $p\text{-value} \leq 0.05$ .

### Significance of the results

- Highly significant at  $p < 0.01$ .
- Statistically significant at  $p < 0.05$ .
- Not significant at  $p > 0.05$ .

### The results

Table (1) reveals that, more than half 57.8% of the pregnant women aged between 30 to less than 40 years with mean 31.81 and SD 5.94. Moreover, the majority 92.2% of the pregnant women were married while only 7.8% of them were divorced. Less than three quarter 71.9% of the pregnant women had children and 60.4% of the pregnant women had one to two children while 39.6% of the pregnant women had three to four children. More than half 59.4% of the pregnant women married from six to ten years while, only 12.8% of the pregnant women married from one to five years with mean 10.50 and SD 5.23.

Figure (1): ) demonstrated that, around two third 64.1% of the pregnant women did not have chronic diseases in the family while 17.2% of them had hypertension, 10.9% of them had diabetes, 4.7% of them had urinary problems and 3.1% of them had heart diseases.

Table (2) shows that, Less than two thirds 62.5% of the studied pregnant women had rheumatic heart disease only and about 10.9% of them had RHD and with hypertension or with Preeclampsia. About 9.4% of the studied pregnant women had RHD and Eclampsia and about 6.3% of the pregnant women had RHD and diabetes. About 42.2% of the pregnant women demonstrated having rheumatic heart disease for less than 5 years with mean 6.75 and SD 2.21.

Table (3) demonstrates that, 75.0% of the studied pregnant women were at 28 to 32 week of gestational age and all 100% of the pregnant women had regular antenatal visit during pregnancy. Regarding reason for the current visit, more than half 57.8% of the pregnant women for ultrasound while, 37.5 of the pregnant women for Follow-up fetal movement and 4.7% of the pregnant women preparation for labor.

Figure (2) reveals that there is significance difference regarding pregnant women total knowledge pre and post intervention about rheumatic heart diseases (p value = 0.000). The majority 92.2% of the pregnant women had satisfactory knowledge about rheumatic heart diseases post intervention while, only 23.4% of the pregnant women had satisfactory knowledge pre intervention.

Table (4 ) shows that there is significance difference regarding pregnant women knowledge pre and post intervention about signs and symptoms of rheumatic heart diseases and prevention of complication (p value = 0.00). Also, there is significance difference regarding pregnant women knowledge pre and post intervention about there are symptoms for a pregnant woman other than these symptoms (p value = 0.001) and how can they be sure that the fetus is in good health (p value = 0.009).

Figure (3) reveals that there is significance difference regarding pregnant women total knowledge pre and post intervention about high-alert medications (p value = 0.000). The majority 89.1% of the pregnant women had satisfactory knowledge about high-alert medications post intervention while, only 20.3% of the pregnant women had satisfactory knowledge pre intervention.

Table (5) shows that there is statistically significant relation between studied pregnant women total knowledge about rheumatic heart diseases pre educational guidelines and the pregnant women age (p=0.044), education level (p=0.002), having children (p=0.000) and pregnant women occupation (p=0.015). It also shows that there is no statistically significant relation between studied pregnant women total knowledge about rheumatic heart diseases pre educational guidelines and the pregnant women social status (p=0.124) and monthly income (p=0.209).

Table (1): Distribution of the pregnant women regarding to socio-demographic characteristics (n=64)

Variables	N	%
<b>Age</b>		
20-<30	24	37.5
30-<40	37	57.8
≥40	3	4.7
Mean ± SD = 31.81 ± 5.94		
<b>Social status</b>		
Married	59	92.2
Divorced	5	7.8
<b>Have children from previous pregnancy</b>		
Yes	46	71.9
No	18	28.1
<b>No. of children n=46</b>		
1-2	28	60.9%
3-4	18	39.1%
<b>Duration of marriage</b>		
1-5	8	12.5
6-10	38	59.4
>10	18	28.1
Mean ± SD = 10.50 ± 5.23		
<b>Pregnant women occupation</b>		
House wife	39	60.9
Governmental	19	29.7
Private work	6	9.4
<b>Husband's occupation</b>		
Governmental	42	65.6
Private work	22	34.4
<b>Monthly income</b>		
Enough	29	45.3
Not enough	35	54.7
<b>Number of family members in the house</b>		
1-3	21	32.8
3-6	30	46.9
>6	13	20.3

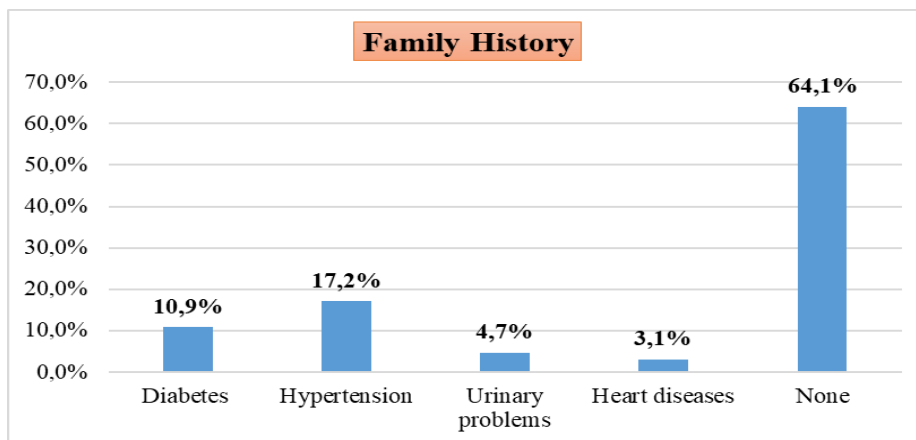


Figure (1): Percentage distribution of the studied pregnant women according to chronic diseases in the family (n=64)

Table (2): Distribution of the studied pregnant women according to their medical and surgical history (n= 64)

Medical history of Pregnant women with chronic heart disease	N	%
Rheumatic heart disease and Diabetes	4	6.3
Rheumatic heart disease and Hypertension	7	10.9
Rheumatic heart disease and Preeclampsia	7	10.9
Rheumatic heart disease and Eclampsia	6	9.4
Rheumatic heart disease only	40	62.5
Duration of rheumatic heart disease		
<5 years	27	42.2
5 years	6	9.4
10 years	15	23.4
>10years	16	25.0
Mean $\pm$ SD = 6.75 $\pm$ 2.21		
Take penicillin every month regularly		
Yes	64	100.0
Suffer from any complications of Rheumatic heart disease before pregnancy		
Yes	10	15.6
No	54	84.4
Suffer from any complications of Rheumatic heart disease during pregnancy		
Yes	15	23.4
No	49	76.6
If yes, what are the complications n=15		
Aortic regurgitation	11	73.3
Aortic valve stenosis	4	26.7
Have medication for Rheumatic heart disease regularly		
Yes	64	100.0
Have taken magnesium sulfate during pregnancy		

Yes	20	31.2
No	44	68.8
Suffering from magnesium sulfate toxicity after taking		
Yes	14	21.9
No	6	9.4
Had previous operations		
Caesarean section	38	59.4
None	26	40.6

Table (3): Number and percentage distribution of the pregnant women according to their history of current pregnancy (n= 64)

History of current pregnancy	N	%
Current gestational age		
28 to 32 week	48	75.0
36 to 38 week	16	25.0
Had regular antenatal visit during pregnancy		
Yes	64	100.0
No	0	0
Reason for the current visit		
For ultrasound	37	57.8
Follow-up fetal movement	24	37.5
Preparation for labor	3	4.7

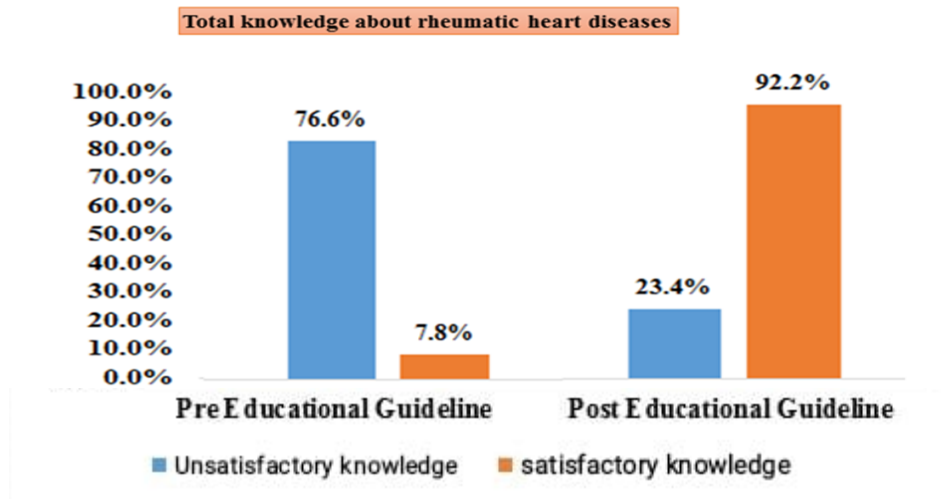


Figure (2): Distribution of the studied pregnant women at pre and post intervention regarding to their total knowledge about rheumatic heart diseases (n=64)

\*\* : Highly statistically significant

Table (4): Distribution of the studied pregnant women at pre and post intervention regarding to their knowledge about rheumatic heart disease (n=64)

Variables	Pre (n=64)		Post (n=64)		Chi Square	
	No	%	No	%	X2	(p-value)
Signs and symptoms of rheumatic heart diseases						
Complete correct	9	14.1	55	85.9	27.11	0.000**
Incomplete correct	11	17.2	4	6.3		
Incorrect	44	68.7	5	7.8		
Other symptoms related to pregnancy						
Correct	13	20.3	60	93.7	24.56	0.001**
Incorrect	51	79.7	4	6.3		
the fetus is in good health						
Complete correct	12	18.8	60	93.7	6.365	0.009**
Incomplete correct	10	15.6	4	6.3		
Incorrect	42	65.6	0	0		
Prevention of complication						
Complete correct	7	10.9	57	89.1	26.59	0.000**
Incomplete correct	10	15.6	3	4.6		
Incorrect	47	73.5	4	6.3		

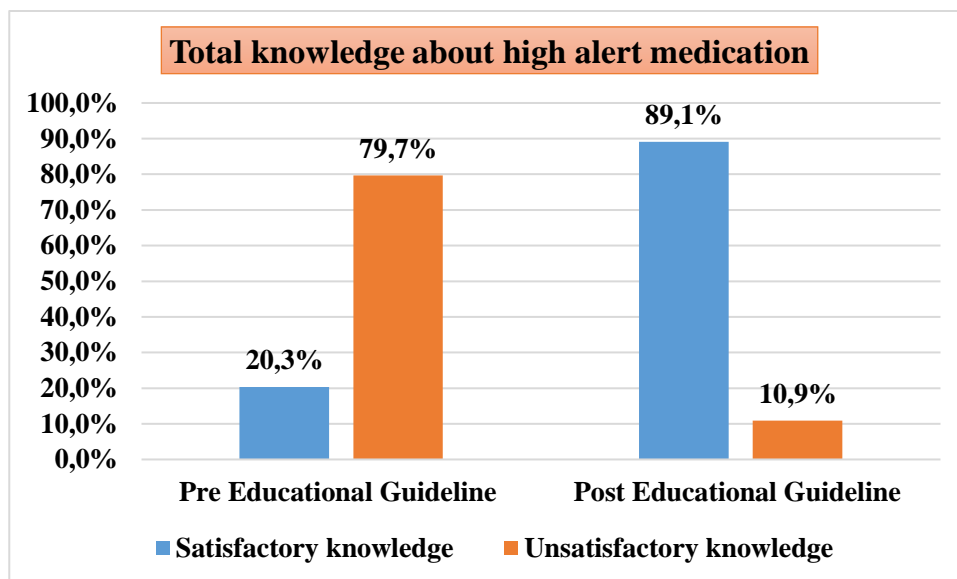


Figure (3): Distribution of the studied pregnant women at pre and post intervention regarding to their total knowledge about high-alert medications (n=64)

\*\* : Highly statistically significant

Table (5): Relationship between socio-demographic characteristics of studied pregnant women and their total knowledge about rheumatic heart diseases

Items		Total knowledge				X <sup>2</sup>	P-Value
		Satisfactory n=14		Unsatisfactory n=50			
		N	%	N	%		
Age	20-<30	2	14.3	22	44.0	2.962	.044*
	30-<40	10	71.4	27	54.0		
	≥40	2	14.3	1	2.0		
Level of education	Can't read and write	0	0	3	6.0	12.50	.002**
	Primary education	0	0	7	14.0		
	Secondary education	4	28.6	35	70.0		
	University and postgraduate studies	10	71.4	5	10.0		
Social status	Married	12	85.7	47	94.0	2.287	0.124
	Divorced	2	14.3	3	6.0		
Have children	Yes	13	92.9	33	66.0	13.08	.000**
	No	1	7.1	17	34.0		
Occupation	House wife	3	21.4	36	72.0	7.107	.015*
	Governmental	9	64.3	10	20.0		
	Private work	2	14.3	4	8.0		
Monthly income	Enough	6	42.9	23	46.0	1.579	.209
	Not enough	8	57.1	27	54.0		

\*Significant at  $p < 0.05$ . \*\*Highly significant at  $p < 0.01$ . Not significant at  $p > 0.05$

## Discussion

Educational guidelines for pregnant women with rheumatic heart disease requires guidelines for diagnosis, treatment and continuous follow-up. Conducting a systematic, accurate and realistic assessment of high alert medications and the potential risks of complications for the pregnant women and fetus and the expected negative results, both during pregnancy and postpartum, is vital to the success and safety of pregnancy (10). Insufficient knowledge and practices regarding high alert Medication among pregnant women with rheumatic heart diseases are the most frequent factors that can result in serious consequences. Sufficient knowledge is vital and this knowledge strengthens the practices. Although Medication Errors happen frequently and continuously, harmful effects result mainly from administering of HAMs, which consistently remain the most problematic drugs associated with medication errors (11). In the light of the previous studies, the researcher conducted this study to evaluate the effect of

nursing educational guideline regarding high alert medications for pregnant women suffering from rheumatic heart disease.

Regarding the demographic characteristics of the studied pregnant women, the current study revealed that more than half of the studied pregnant women was  $31.81 \pm 5.94$  years and had secondary education. In addition, most of them were married and more than two thirds have children from previous pregnancy ranging from one to two child. These findings agree with (12). who found that the mean age of the women was  $36.3 \pm 8.2$  years. Concerning studied pregnant women level of education, it was noticed that more than half of women are cannot read and write, nearly two thirds of them hadn't receiving any previous knowledge regarding heart disease during pregnancy before. These findings may be attributed that specific information regarding heart diseases was ignored from some administrators which affect health care negatively.

Concerning, medical and surgical history, less than two fifth of the studied pregnant women did had chronic diseases such as diabetes, hypertension, preeclampsia and eclampsia with RHDs as well as less than half of them suffering from rheumatic heart disease less than five years. In addition, all of them take penicillin every month regularly and most of them suffering from complications of rheumatic heart disease before pregnancy. This result disagree with (13) in their study done in Baghdad they revealed that one third of studied pregnant women only were always receiving knowledge regarding heart disease during pregnancy. Similarly to (14) , reported that approximately one third of studied pregnant women had correct knowledge about complication of heart diseases during pregnancy.

These findings were highly supported by (15). who reported that women knowledge regarding signs & symptoms of rheumatic heart disease during pregnancy was in adequate and recommended educational guidelines for pregnant women, there was a high statistical significant improvement in women's knowledge about rheumatic heart diseases during pregnancy at post educational guidelines and follow up phases of the application of the educational guidelines ( $p$ -value < 0.01).

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

A Similar study conducted by (16) , stated that there was a highly statistically significant improvement in knowledge of women related to management of high alert medications among pregnant women suffering from heart disease during pregnancy after an educational guidelines. This is due to effect of educational guidelines as it is positively improve knowledge of the pregnant women. Another study conducted by (17) , found that there was a recognized improvement in women knowledge regarding high alert medications among pregnant women with rheumatic heart diseases after applying an educational guidelines. Moreover, the study revealed a significant improvement in post test score. This result was in

agreement with (18) , who indicated that providing rheumatic heart disease educational classes for women about high alert medications can be successfully increases women knowledge therefore; the implemented educational guidelines was effective and had an impact on women knowledge about management of women with rheumatic heart disease during pregnancy.

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

Health education is known to be an integral part of nursing care, because primary care providers are positioning close contacts in the hospital in an ideal position to provide education on risk factors for rheumatic heart disease and advice pregnant women to make lifestyle adjustments (19). Those who work in outpatient pregnant women clinics and follow up on pregnant women should assess the risk factors for rheumatic heart disease and carry out activity to provide awareness of cardiovascular disease with a focus on preventive measures for their pregnant women (20). Many women felt that they received supportive care from the health care team, felt grateful and praised the skills and responsiveness of clinicians to them. It also mentioned the feeling of safety when making profit knowledge about high alert medications and healthy habits know; benefit is greatest in those at increased risk of cardiovascular disease (21).

### **Conclusion**

Based on the present study and research hypotheses it can be concluded that: The result of the study supported the research hypotheses that, improvement knowledge after implementing nursing guideline regarding management of high alert medication & rheumatic heart diseases during pregnancy. A highly statistically significant improvement among pregnant women knowledge regarding high alert medication & rheumatic heart diseases. There was a highly statistically significant relation between pregnant women total knowledge and their age and level of education post education guideline .

### **Recommendations**

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

- The nursing educational guidelines regarding high alert medications for the pregnant women with rheumatic heart disease should be applied by the nursing staff at outpatient clinic besides high risk words.
- A simplified and comprehensive booklet should be available for all women suffering from rheumatic heart disease and high alert medications, This booklet should include a clear, brief and simple explanation about high alert medications to reduce complication

### Recommended for further Researches

- The effect of nursing health education on the care of girls before marriage to prevent rheumatic heart disease during pregnancy.
- Provide adequate training for midwifery nursing staff about rheumatic heart disease and high alert medication.

### References

1. Abernathy, B., (2018). Home Monitoring in Patients with Hypoplastic Left Heart Syndrome: A Literature Review. *Pediatric Nursing*, 44(2).
2. Adamson, D. L., Nelson-Piercy, C. (2018). Heart Disease in Pregnancy. *Dewhurst's Textbook of Obstetrics & Gynaecology*, 85-96.
3. Ding, S., Deng, Y., Lu, S., Lamb, K., Zhang, Y., & Wu, Y. (2017). Knowledge and Practice in Cardiovascular Disease Prevention among Hospital Registered Nurses: A Cross-Sectional Study. *Journal of Clinical Nursing* , 26(21-22), 33183327.
4. Edwards, J. G., Barry, M., Essam, D., Elsayed, M., Abdulkarim, M., Elhossein, B., ... & Chang, A. Y. (2021). Health system and patient-level factors serving as facilitators and barriers to rheumatic heart disease care in Sudan. *Global health research and policy*, 6(1), 1-12.
5. El-Sabah, E., Zaiton, H. (2019). Impact of Intervention Program on Nurse's Knowledge and Practice Regarding Nursing Care of Pregnant Cardiac Patients During Labor, Faculty of Nursing, Zagazig University.
6. Eman, E. M. & Hala, I. Z. (2020). Impact of Intervention Program on Nurse's Knowledge and Practice Regarding Nursing Care of Pregnant Cardiac Patients during Labor. *Med. J. Cairo Univ.*, 81(2), 141-153.
7. Fung, T., Isanaka S., Hu, F., & Willett W. (2018). International Food Group based diet quality and risk of coronary heart disease in men and women. *The American Journal of Clinical Nutrition*, 107(1), 120-129. Available at: [academic.oup.com-TT Fung, SIsanaka, FB Hu. The American journal](http://academic.oup.com-TT Fung, SIsanaka, FB Hu. The American journal).
8. Garris, A., (2017). *Nurses' Knowledge Related to Heart Failure Essentials*, Available at: [books.google.com-J Green, N Thorogood](http://books.google.com-J Green, N Thorogood).
9. Grinalds, M. S., Washburn, N. C., Daniel, J. W., & Walroth, T. A. (2021). Interrater reliability and ease of use of the High-Alert Medication Stratification Tool-Revised Prospective (HAMST-R PRO): A prospective, multisite study. *American Journal of Health-System Pharmacy*.
10. Hussein, A. and Al-Ganmi, A. (2019). Assessment of Nurses' Knowledge Concerning Cardiogenic Shock for Patients' in Cardiac Care Unit at Baghdad Hospitals, College of Nursing, University of Baghdad, p.p. 4-6.
11. Kazma, J. M., van den Anker, J., Allegaert, K., Dallmann, A., & Ahmadzia, H. K. (2020). Anatomical and physiological alterations of pregnancy. *Journal of pharmacokinetics and pharmacodynamics*, 1-15.
12. Kumar, T., Tandi, R., & Thalla, A. (2021). Maternal and perinatal outcome in heart disease complicating pregnancy. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 10(10), 3725-3732.
13. Mahramus, T., Penoyer, D., Frewin, S., Chamberlain, L., Wilson, D. Sole, M. (2018). Women's knowledge regarding high alert medications among pregnant women's with rheumatic heart diseases after applying an educational program. Available at: [books.google.com](http://books.google.com).

14. Mohammed, A., Mostafa, H (2018). Maternity Nurses. Performance Regarding Cardiopulmonary Resuscitation during Pregnancy: Simulation Based Intervention. Available at: books.google.com.
15. Mohammed, A., Mostafa, H (2018). Maternity Nurses. Performance Regarding Cardiopulmonary Resuscitation during Pregnancy: Simulation Based Intervention. Available at: books.google.com.
16. Patel, L. A., Yadav, V. D., Jain, M. J., & Wadhokar, O. C. (2021). Positive Outcomes of Comprehensive Exercise Program on Restoration of Functional Level and Quality of Life in a Patient with Rheumatic Heart Disease Undergone Mitral Valve Replacement: A Case Report.
17. Pijuan, A., Galian, L., Goya, M. (2018). Cardiac Complications during Pregnancy are better Predicted with the Modified who Risk Score. *Int J Cardiol* 195:149– 154. Published Thesis, School of Nursing, Rhode Island College.
18. Preez, R. (2019). Human Factors Causing Medication Administration Errors as Self Reporting by Registered Professional Nurses, Un Puplished Master Degree, Faculty of Medicine and Health sciences, Stellenbosch University.
19. Schepel, L., Lehtonen, L., Airaksinen, M., & Lapatto-Reiniluoto, O. (2021). How to identify organizational look alike, sound alike and highly concentrated electrolytes. *Journal of patient safety*, 17(8), e1358-e1363.
20. Soliman,(2016).Availableatwww.mmj.eg.net/article.HYPERLINK "http://www.mmj.eg.net/article.%20asp?issn=11102098;%20year=2016"asp?issnHYPERLINK"http://www.mmj.eg.net/article.%20asp?issn=11102098;%20year=2016"=1110-2098; year=2016.
21. Watkins, D., A, Johnson, C., O, Colquhoun, S., M, Karthikeyan, G, Beaton, A, Bukhman, G. (2017). Global, regional, and national burden of rheumatic heart disease.