Effect of an Educational Program on Knowledge and Self Care Practices of Pregnant Women regarding Prevention of Puerperal Sepsis

[1] Ghada Mohamed Taha Abd-Elsatar, [2] Samia Abdel Hakeem Hasneen, [3]Elham Abozied Ramadan and [4]Fatma Kamal Ali Ahmed

(1) Demonstrator of Obstetrics and Gynecological Nursing, Faculty of Nursing, Benha University,
(2) Professor of Obstetrics & Gynecological Nursing, Faculty of Nursing, Benha University,
(3) Assistant Professor of Obstetrics & Gynecological Nursing, Faculty of Nursing, Benha University and
(4) Lecturer of Obstetrics & Gynecological Nursing, Faculty of Nursing, Benha University.

Abstract

Background: Puerperal sepsis is one of the major causes of preventable maternal morbidity and mortality, a common pregnancy-related condition that could eventually lead to obstetric shock or even death in some cases. **Aim of the study:** The study aimed to evaluate the effect of an educational program on knowledge and self-care practices of pregnant women regarding prevention of puerperal sepsis. **Design**: A quasi-experimental study design (one group: time series quasi-experimental design) was used to fulfill the aim of study. **Setting:** The study was conducted at Obstetrics and Gynecological outpatient clinic affiliated to the Benha University Hospital. **Sample**: A purposive sample included (120) pregnant women. **Tools of data collection:** Three tools were used, tool I: A structured interviewing questionnaire which included two parts: General characteristics of pregnant women and obstetrical history, tool II: Pregnant women's knowledge assessment sheet and tool III: Pregnant women's self-care practices assessment sheet **Results:** There was a highly statistical significant improvement among pregnant women level of knowledge and self-care practices at post intervention and follow-up phases compared to pre-intervention phase with ($P<0.001$).**Conclusion:** Educational program had a positive effect on improving pregnant women's knowledge and self-care practices regarding prevention of puerperal sepsis. **Recommendations:** Designing and implementing guidelines among pregnant women during third trimester and postpartum period for raising the awareness about the care during postpartum period.

Key words: Educational program, Knowledge, Pregnant women, Puerperal sepsis and Self-care practice.

Introduction

Puerperal sepsis is an important public health problem which is a leading cause of maternal mortality, especially, in developing countries, due to the lack of knowledge on preventive methods. In developing world, it has been reported that puerperal sepsis is the second most cause of maternal mortality. Maternal mortality cases have not declined in spite of efforts by both sectors (public and private) to prevent such deaths **(Hassan, et al., 2021).**

Puerperal sepsis is a serious type of septicemia contracted by women during or soon after child birth, miscarriage or unsafe abortion. It has been reported that some morbidities associated with puerperal sepsis includes; Septicemia, Vaginal discharge, Peritonitis or abscess formation leading to surgery, endotoxic shock, Pelvic abscess, and finally mortality among others. It usually originates from organisms that constitute the normal vaginal flora. Due to presence of amniotic fluid, blood, and lochia; they

increase the risk of infection by decreasing the vaginal acidity and providing an alkaline environment which encourage the growth of bacteria. Infections can also easily enter the female genital tract externally and ascend through the internal genital structures during the vaginal birth **(Bishaw, et al., 2022).**

Puerperium is the period following childbirth during which the body organs or systems revert back to the pre-pregnant state both anatomically and physiologically. Puerperium extends for about six weeks in duration. WHO describes the puerperium period, as the most critical and yet the most neglected phase in women's live during which a variety of postpartum complication occur including puerperal sepsis. Most postpartum infections take place after hospital discharge, which is usually after 48 hours following delivery. In the absence of postnatal follow-up, many cases of puerperal sepsis go undiagnosed and unreported **(Beraki, et al., 2020)**.

Puerperal sepsis arises from several causes including the practices that women follow during pregnancy and after childbirth are among the most important causes of puerperal sepsis, such as not maintaining personal and vaginal hygiene, sitting with people with contagious diseases, not doing enough exercise, and not going to the doctor if there is a foul-smelling vaginal discharge or severe pain in the abdomen, home birth in unhygienic conditions, poor nutrition, tension and nervousness, eating fast food and taking medications without the supervision of a specialist. Other general predisposing factors including: obesity, diabetes, impaired immunity and history of pelvic infection **(Abdel-fattah, et al., 2022*)***.

Puerperal sepsis is preventable with provision of adequate antenatal care, referral and timely treatment of complications of pregnancy, promoting institutional delivery and postnatal care. Some developing countries have experienced increased use of health facilities for labor and delivery care, but there is a lack of proper monitoring or checks and balances and there is a possibility that this trend could lead to rising rates of puerperal sepsis. Drug and technological developments need to be combined with effective health system intervention to reduce infection, including puerperal sepsis **(Admas, et al., 2020).**

Prevention is always better than cure, as we all understand. Nurses play a vital role to prevent puerperal infections. Because small negligence or simple ignorance can within a short period of time become abnormal. therefore, successful delivery can quickly turn in to the disease. The nurse was often unaware or ignorant of the prevention of infection in the woman over time; the nurse, who was expected to exercise caution in treating puerperal infections, was given increasing responsibility. In modern medical practice, nurses are granted a growing latitude to have awareness of puerperal sepsis prevention **(Atlaw et al., 2019).**

Maternity nurses are involved in the prevention and treatment of puerperal infections. Good prenatal care is essential for avoiding the risk of infection after childbirth. Postpartum nurses assess mothers for signs and symptoms of infection and educate them about these signs and symptoms prior to discharge. Also the nurses play an important role to develop multidisciplinary approach and intervention plans to cover the postpartum mother, qualifies the care given to contribute decisively to prevent and reduce the rates of puerperal infection **(Mahmoud, 2022).**

Nursing education on the basis of scientific principles, which emphasizes the

importance of practice and knowledge sharing between staff nurses and postpartum women, should be applied. Thus, educational actions become transformed and build a potentiating strategy of nursing care in pregnancy and childbirth **(Sarkar, et al., 2019).**

Aim of the study

The study aimed to evaluate the effect of an educational program on knowledge and self-care practices of pregnant women regarding prevention of puerperal sepsis.

Study hypothesis

H1-Implementation of an educational program would improve knowledge of pregnant women regarding prevention of puerperal sepsis.

H2-Implementation of an educational program would improve self-care practices of pregnant women regarding prevention of puerperal sepsis.

Study design

A quasi-experimental study design (one group: time series quasi-experimental design) was used to fulfill the aim of study. Quasi-Experiment is a study in which the researcher operates the level of some independent variable and then measures the result. Quasi-Experiments are potent methods for assessing cause-and-effect relations.

Setting

The study was conducted at Obstetrics and Gynecological outpatient clinic affiliated to the Benha University Hospital. Outpatient clinic locates at the ground floor, consists of two rooms, two examination tables and two ultrasound devices. There is awaiting place for women in the front of outpatient clinic. This setting provides obstetrics and gynecology healthcare services that include antenatal care, counseling and follow up services. It works every day from 9 am to 12 pm except Friday.

Sample type: A purposive sample was used from the above-mentioned setting.

Sample size: The total number of pregnant women attending to outpatient clinic at Benha University Hospital for three months starting from the beginning of January to the end of March, which were (120) pregnant women.

Inclusion criteria:

- Pregnant women with gestational age (30-35Weeks).
- Free from any medical or obstetrics complication.

Tools of Data collection:

Three tools were utilized for data collection:

Tool I: A structured Interviewing Questionnaire:

This tool was constructed by the researcher in Arabic language based on reviewing the related literatures ***(Gamel, et al., 2020; Lowdermilk, et al., 2019)***.Under the guidance of the supervisor, Itwas included two parts:

Part 1: General characteristics of pregnant women: such as age, marital status, level of education, occupation, residence, monthly income.

Part 2: Obstetrical history: included (Gestational age, gravida, parity, number of abortions, complications of previous pregnancy, type of previous labour, complications of previous labour and complication of previous postpartum.

Tool II: Pregnant Women's Knowledge Assessment Sheet:

This tool was constructed by the researcher in Arabic language based on reviewing the related literatures under the guidance of the supervisor. It was used to assess pregnant women's knowledge about puerperal sepsis. It consisted of 4 sections: ***Section (1)*** knowledge regarding postpartum period **(11)** questions, ***Section (2)*** knowledge

regarding complication of the postpartum period **(6)** questions, ***Section (3)*** knowledge regarding puerperal sepsis **(6)** questions, ***Section (4)*** knowledge regarding prevention of puerperal sepsis **(5)** questions.

Scoring system

A studied pregnant women's answers were compared with model key answers, each item was assigned a score **(2)** given when the answer was correct and a score **(1)** was given when the answer was incorrect: the total score of each section was calculated by summation of the scores of its items. The total knowledge score was calculated by the addition of the total score of all sections and ranged from (28-56).

The score of total knowledge was classified as the following:

- Adequate level when the total score was ≥ 60%.
- Inadequate level when the total score was <60%.

- **Tool III: Pregnant Women's Self-care Practices Assessment Sheet:**

This tool was constructed by the researcher in Arabic language based on reviewing the related literatures under the guidance of the supervisor. It was used to assess pregnant women's self-care practices regarding prevention of puerperal sepsis. It consisted of 7categories: **Category (1**) Self-care Practices regarding health responsibility (13 steps), **Category (2)** Self-care Practices regarding nutrition (11 steps), **Category (3)** Self-care Practices regarding physical activity(6 steps), **Category (4)** Self-care Practices regarding genital hygiene (11 steps), **Category (5)** Self-care Practices regarding wound care (18 steps), **Category (6)** Self-care Practices regarding breast care, (16 steps), **Category (7)** Self-care Practices regarding rest and sleep (6 steps).

Scoring system

The items were judged according to three-point likert scale continuum from never (1), sometimes (2), and always (3). Then, summing up the scores of the items in each category and the overall scores gave the health practice score which ranged from (81-243). The mean and standard deviation was calculated. As well as women' total practice score was classified as the following:

- Satisfactory level when the total score was ≥ 60%.
- Unsatisfactory level when the total score was <60%.

Tools validity

Tools of data collection were investigated for their content validity by panel of three experts in obstetrics & gynecological Nursing specialty from the Faculty of Nursing, Benha University, who are selected to test content validity of the tools and to judge its clarity, relevance, comprehensiveness, understanding and applicability. The opinion was elicited regarding the layout, format and sequence of the questions and all of their remarks were taken into consideration and the tools were regarded as a valid from the experts' point of view.

Tools reliability

Reliability for tools was applied by the researcher for testing the internal consistency of the tools by administrating of the same tool to the same subjects under similar condition. Internal consistency reliability of all items of the tools was assessed using Cranach's alpha coefficient. It was (0.85) for pregnant women's knowledge assessment sheet **(tool II)** and (0.86) for pregnant women's self-care practices assessment sheet **(tool III)**

Ethical consideration

Ethical aspects were considered before starting the study as the following: The study approval was obtained from scientific research ethical committee, faculty of nursing at Benha University before starting the study. An official permission from the selected study settings was obtained for the fulfillment of the study. The aim of the study was explained to each pregnant woman before applying the tools to gain their confidence and trust. The researcher took informed consent from pregnant women to participate in the study and confidentialities were assured. The data was collected and treated confidentially. All pregnant women were given the option to withdrawal from the study at any time. All pregnant women received the educational and counseling services in the form of an educational program for an ethical consideration. The researcher emphasizes that the participant is voluntary for participating in the educational program. The study didn't harm dignity and traditional, religious aspects of the women.

Pilot Study

A pilot study was conducted on 10% of the total duration of data collection (2 weeks-12 pregnant women). In order to test the applicability of the constructed tools and the clarity of the included questions. The pilot has also served to estimate the time needed for each subject to fill in the questions and to identify the problems that may be encountered during the study. No modifications were done. All pregnant women in the pilot study were included into the sample.

Filed Work

To fulfill the aim of the study, the following phases were adopted. Interviewing and assessment phase, designing of the program phase, implementation of the program phase and evaluation of program phase. These phases were carried out from the beginning of January 2022up to the end of March 2022 covering three months. The researcher visited the previously mentioned setting three days/week, (Sunday, Tuesday, Thursday), from 9.00 Am to 12.00 Pm.

The study was achieved through the following phases.

Interviewing and assessment phase:

This phase encompassed interviewing pregnant women to collect socio-demographic characteristics, baseline data about pregnant women's knowledge and self care practices regarding prevention of puerperal sepsis through asking questions. At the beginning of interview the researcher greeted the women, introduced herself to each pregnant women included in the study, explained the purpose of the study and provided the women with all information about the study (purpose, duration, and activities) and take oral consent.

Data were collected by the researcher through administration of structured Interviewing Questionnaire sheet **(Tool no. I)** to assess general characteristics and obstetric history of pregnant women). **Tool no. II** (Pre-posttest) to assess pregnant women's knowledge regarding prevention of puerperal sepsis. **Tool no. III** (Pre-posttest) to assess pregnant women's self-care practices regarding prevention of puerperal sepsis. Average time for the completion of each women interview was around (30-45 minutes). The number of pregnant women that was collected per day was (3-4) women.

Planning phase

Based on baseline data obtained from assessment phase and relevant review of literature, the educational program was designed by the researcher for pregnant women to accommodate the pregnant women's deficit knowledge and self-care practices regarding prevention of puerperal sepsis. The number of sessions and its

contents, instructional media, and different methods of teaching were determined.

Implementation phase

General and specific objectives of educational program were stated and implemented to satisfy the actual needs of the studied sample. At the beginning of the first session, pregnant women were oriented with the program contents. Each woman was informed about the time of the next sessions at the end of session, taking into consideration the use of Arabic language that suits the pregnant women educational level. The subsequent session started by a feedback about the previous session and the objectives of the new session. Motivation and reinforcement during sessions were used to enhance motivation for the sharing in the study. During sessions, each woman has an opportunity to ask questions and share information with each other. At the end of each session, the researcher gave chance to pregnant women to ask any questions to correct any misunderstanding related to the presentation of puerperal sepsis.

Different strategies of teaching were used as lecture, discussion, role model, demonstration and redemonstration, suitable teaching media were included hand out (Booklet) about prevention of puerperal sepsis and its symptoms which constructed by the researcher in a simple Arabic language after reviewing the related literatures **(Axelsson, 2019 and Aisien, 2021)** and based on pregnant women' knowledge and practice deficit about prevention of puerperal sepsis were distributed to all recruited pregnant women in the study to achieve its objectives and video through labtop to help proper understanding of the content by the pregnant women.

The educational program was implemented through 6 sessions, two theoretical sessions and four clinical sessions. The duration of each session was (45-60) minutes. These sessions conducted for small groups. The study sample was classified into (30) groups for the period of data collection and each group involved (3-4) pregnant women then the researcher designed the (6) sessions for illustrating information regarding puerperium and puerperal sepsis to all pregnant women participating in the study as the following:

First session: it included information regarding puerperium and puerperal sepsis and booklet was distributed on pregnant women, **Second session:** it was focused on self-care instructions regarding health responsibility and healthy nutrition, **Third session:** it was focused on self-care instructions regarding rest , sleep and measures of overcoming stress (Relaxation exercise), **Fourth session:** it was focused on self-care instructions regarding physical activity and stretching exercises, **Fifth session:** it was focused on hand washing and self-care instructions regarding genital hygiene. **Sixth session:** it was focused on wound care and breast care.

Evaluation phase:

The evaluation phase emphasized on determining the effect of an educational program on knowledge and self-care practices of pregnant women regarding prevention of puerperal sepsis by comparing the results pre, post and follow-up implementation of educational program.Post-test was done after one-week of delivery and follow-up test was done after one-month of post-test to evaluate the effectiveness of an educational program.In order to test pregnant women' retention of knowledge and improving of practice as indicators of this

program. The researcher used **Tool no. II** (Pre-posttest) to assess pregnant women's knowledge regarding prevention of puerperal sepsis. **Tool no. III** (Pre-posttest) to assess pregnant women's self-care practices regarding prevention of puerperal sepsis. At almost time the researcher followed women via telephone.

Statistical analysis

Data analysis was performed using IBM SPSS (Statistical Package for Social Sciences) statistical software version 25. The data were explored. Descriptive statistics with mean and standard deviation (SD) for continuous variables and frequency for categorical variables were analyzed. Qualitative variables were compared using qui square test (x2) as the test of significance, and difference between the group during the three phases were assessed by Friedman test. Correlation coefficient (r) was used to test the correlation between quantitative data.

- P-value > 0.05 Not significant (NS)
- P-value ≤ 0.05 Significant (S)
- P-value ≤ 0.001 Highly Significant (HS).

Results

Table (1) shows that, less than half (46.6%) of the studied pregnant women were aged 20-25 years with mean age was 25.50 ± 5.01 years. Regarding Social status, Most (95.0%) of studied pregnant women were married, Regarding educational level, less than half (48.4%) of them had secondary education. Moreover, more than three-quarters (78.3%) of them were house wife. Furthermore, three fifth (60%) of the studied pregnant women had been living in rural areas. In addition, less than three-quarters (71.7%) of them didn't have enough income.

Table (2) displays that, the mean SD of gestational age was 32.40±0.98 weeks. Also, less than two-thirds (61.7% and 65%) of the studied pregnant women had one gravida and no para, respectively. Moreover, the majority (86.7%) of them didn't have history of abortion. Furthermore, more than one-quarter (28.3%) of the studied pregnant women had complications of previous pregnancy, nearly two-thirds (67.6%) of them had anemia. In addition, more than half (57.2%) of the studied pregnant women who delivered before, had vaginal delivery. Also, about one-tenth (11.9%) of the studied pregnant women who delivered before, had complications, four-fifth (80%) of them had excessive bleeding. Regarding complication of the postpartum, less than one-fifth (16.7%) of the studied pregnant women who delivered, had previous postpartum complications and less than three-quarters (71.4%) of them had excessive bleeding.

Table (3) displays that, there was a marked improvement in all sections of pregnant women' knowledge regarding puerperal sepsis at post intervention and follow-up phases compared to pre intervention phase with a highly statistically significant difference (P= ≤ 0.001).

Figure (1) shows that, more than one-quarter (27.5%) of the studied pregnant women have adequate total knowledge score regarding puerperal sepsis at pre intervention phase compare to more than three-quarters (78.3% and 76.7%) at post intervention and follow-up phases, respectively.

Table (4) reveals that, there was a marked improvement in all categories of pregnant women' self-care practices categories regarding prevention of puerperal sepsis at post intervention and follow-up phases compared to pre intervention phase with a highly statistically significant difference (P= ≤ 0.001).

Figure (2) shows that, about two-fifth (39.2%) of the studied pregnant women had satisfactory level of total practices regarding prevention of puerperal sepsis at pre intervention phase compare to more than three-quarters (76.7%) at post intervention and less than three-quarters (73.3%) at follow-up phase.

Table (5) explains that, there was a highly statistically significant positive correlation between studied pregnant women' total knowledge and total self-care practices scores regarding puerperal sepsis at pre-intervention, post- intervention and follow-up phases ($p \leq 0.001$).

Table (1): Distribution of the studied pregnant women according to their general characteristics **(n=120).**

General characteristics	No.	%
Age (years)		
<20	13	10.8
20-<25	**56**	**46.6**
25-<30	23	19.2
30-<35	17	14.2
≥ 35	11	9.2
Mean ±SD	**25.50 ± 5.01**	
Social status		
Married	**114**	**95.0**
Widow	6	5.0
Educational level		
Read and write	10	8.3
Basic education	22	18.3
Secondary education	**58**	**48.4**
University education	30	25.0
Occupation		
Working	26	21.7
House wife	**94**	**78.3**
Residence		
Urban	48	40.0
Rural	**72**	**60.0**
Monthly income		
Enough	34	28.3
Not enough	**86**	**71.7**

Table (2): Distribution of the studied pregnant women according to their obstetrical history **(n=120).**

Obstetrical history	No.	%
Gestational age (weeks)		
Mean ±SD	32.40±0.98	
The number of pregnancies		
One	74	61.7
Two	34	28.3
Three or more	12	10.0
The number of labours		
Non	78	65.0
One	37	30.8
Two	5	4.2
The number of abortions		
Non	104	86.7
One time	16	13.3
Complications of previous pregnancy		
Yes	34	28.3
No	86	71.7
If yes answer, (n=34)		
Hypertension	4	11.8
Anemia	23	67.6
Gestational diabetes	7	20.6
Type of previous labour (n=42)		
Vaginal delivery	24	57.2
Cesarean section	18	42.8
Complications of previous labour (n=42)		
Yes	5	11.9
No	37	88.1
If yes answer, (n=5)		
Excessive bleeding	4	80.0
Fetal asphyxia	1	20.0
Complication of previous postpartum (n=42)		
Yes	7	16.7
No	35	83.3
If yes answer, (n=7)		
Excessive bleeding	5	71.4
Puerperal sepsis	1	14.3
Urinary tract in	1	14.3

Table (3): Distribution of the studied pregnant women regarding knowledge sections about puerperal sepsis at Pre- intervention, Post- intervention and follow-up phases **(n=120).**

Items	Pre-intervention				Post-intervention				Follow-Up				Friedman test	
	Adequate		Inadequate		Adequate		Inadequate		Adequate		Inadequate		X2	P-value
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Knowledge regarding postpartum period	36	30.0	84	70.0	99	82.5	21	17.5	97	80.8	23	19.2	**207.9**	**0.000****
Knowledge regarding complications of postpartum period	22	18.3	98	81.7	100	83.3	20	16.7	92	76.7	28	23.3	**177.1**	**0.000****
Knowledge regarding puerperal sepsis	14	11.7	106	88.3	95	97.2	25	20.8	88	73.3	32	26.7	**189.7**	**0.000****
knowledge regarding prevention of puerperal sepsis	47	39.2	73	60.8	102	85.0	18	15.0	101	84.2	19	15.8	**133.2**	**0.000****
Total knowledge score	**33**	**27.5**	**87**	**72.5**	**94**	**78.3**	**26**	**21.7**	**92**	**76.7**	**28**	**23.3**	**163**	**0.000****

**** P-value ≤0.001 (HS).**

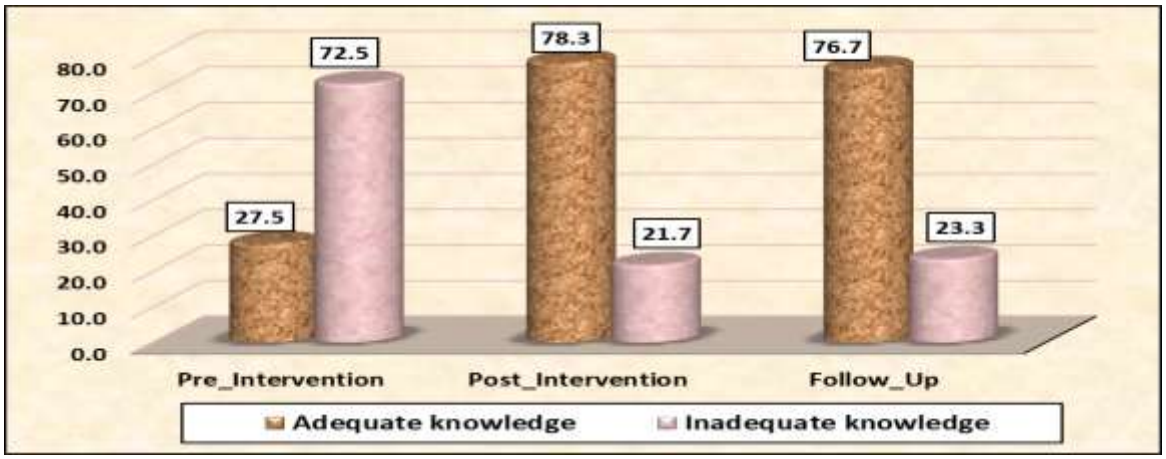

Figure (1): Percentage distribution of studied pregnant women regarding their total knowledge score at pre, post intervention and follow up phases **(n = 120).**

Table (4): Distribution of the studied pregnant woman's self-care practices categories regarding prevention of puerperal sepsis at Pre- intervention, Post- intervention and follow-up phases **(n=120).**

Items	Pre-intervention				Post-intervention				Follow-Up				Friedman test	
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		X2	P-value
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Health responsibility	41	34.2	79	65.8	100	83.3	20	16.7	96	80.0	24	20.0	**184.2**	**0.000****
Nutrition	36	30.0	84	70.0	92	76.7	28	23.3	90	75.0	30	25.0	**157.7**	**0.000****
Physical activity	32	26.7	88	73.3	84	70.0	36	30.0	78	65.0	42	35.0	**42.7**	**0.000****
Genital hygiene	49	40.8	71	59.2	107	89.2	13	10.8	103	85.8	17	14.2	**137.0**	**0.000****
Wound care	50	41.7	70	58.3	102	85.0	18	15.0	100	83.3	20	16.7	**150.4**	**0.000****
Breast care	54	45.0	66	55.0	92	76.7	28	23.3	90	75.0	30	25.0	**98.8**	**0.000****
Rest and Sleep	41	34.2	79	65.8	89	74.2	31	25.8	85	70.8	35	29.2	**88.6**	**0.000****
Total self-care practices score	**47**	**39.2**	**73**	**60.8**	**92**	**76.7**	**28**	**23.3**	**88**	**73.3**	**32**	**26.7**	**115**	**0.000****

**** P-value ≤0.001 (HS).**

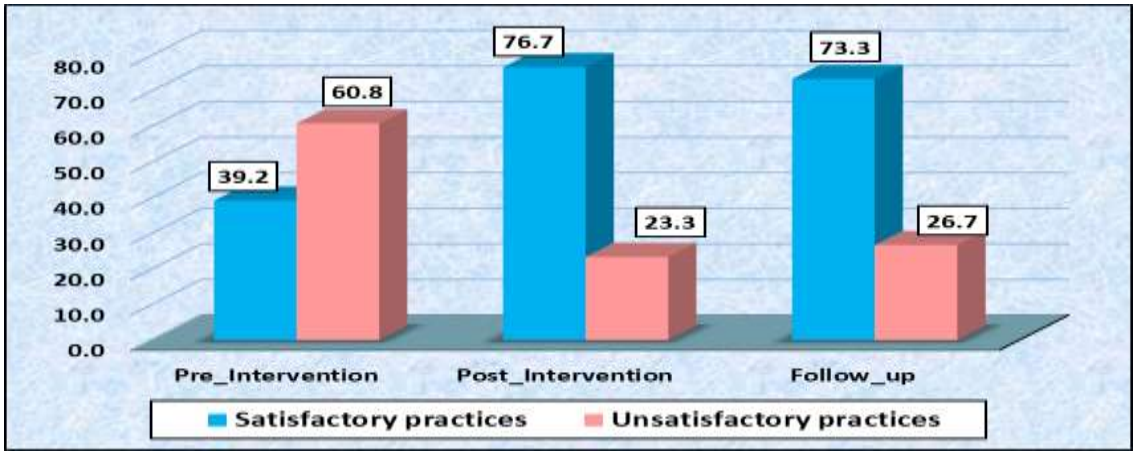

Figure (2): Percentage distribution of studied pregnant women regarding their total self-care practices' score at pre, post intervention and follow up phases **(n = 120).**

Table (5): Correlation between studied pregnant women' total knowledge and total self-care practices scores regarding prevention of puerperal sepsis at Pre- intervention, Post-intervention and follow-up phases **(n=120).**

Variable		Total knowledge score					
		Preintervention		Post intervention		Follow up	
		r	P value	r	P value	r	P value
Total self-care practice score	Preintervention	0.768	0.000**				
	Post intervention			0.953	0.000**		
	Follow up					0.915	0.000**

** P-value ≤0.001 (HS).

Discussion

Puerperal sepsis is an important public health problem which is a leading cause of maternal mortality, especially, in developing countries, due to the lack of knowledge on preventive methods. Around one-tenth of maternal deaths worldwide are secondary to peripartum maternal infections and sepsis, most of which occur in low-income countries and it is the third common cause of maternal mortality following postpartum hemorrhage and hypertensive disorder of pregnancy. Puerperal sepsis can cause chronic health problems such as chronic pelvic inflammatory disease and infertility **(Khanna and Selvam, 2020)**.

As regards general characteristics of the studied pregnant women, less than half of the studied pregnant women were aged 20-25 years with mean age was 25.50 ± 5.01 years. Also, regarding to social status, the most of them were married. From my point of view, similarity of the finding may be due to that it is the normal age of childbirth .This result is nearly similar to ***Nchimbi and Joho (2022)*** who studied "Puerperal sepsis-related knowledge and reported self-care practices among postpartum pregnant women in Dar es salaam, Tanzania "and found that, nearly half of the pregnant women were aged between 18 and 28 years with the mean age of 27.56 ± 6.22 years. In the same line, this result is in agreement with ***Beraki, et al., (2020),*** who studied "Knowledge on

postnatal care among postpartum mothers during discharge in maternity hospitals in Asmara" and reported that, the majority of the postpartum pregnant women were married.

Concerning educational level and occupation, the results of the current study revealed that, less than half of the studied pregnant women had secondary education. Also, more than three-quarters of the studied pregnant women were housewife. From my point of view, most Egyptian mothers preferred to stay at home to take care of their husbands and children rather than complete their education and the majority of the studied women had a low level of education and from rural areas, which leads to decrease their work opportunities.

This result is in agreement with ***Abdel-fattah, et al., (2022),*** who studied" knowledge and practice of postpartum mothers regarding puerperal sepsis prevention" and reported that less than half of the studied pregnant women had secondary education. Also, this result is in agreement with ***Farg and Hassan (2020)*** who conducted a study to assess "Obstetric outcomes for teenage and adult pregnancy: a comparative study" and clarified that, the most of postnatal mothers were housewives.

Concerning residence and monthly income, the results of the current study clarified that, three fifth of the studied pregnant women lived in rural areas. Also, less than three-quarters of the studied pregnant women didn't have enough income. From my point of view, this may be due to more than three-quarters of the studied pregnant women were housewife This result is in agreement with ***Admas, et al., (2020),*** who studied "Proportion of bacterial isolates, their antimicrobial susceptibility profile and factors associated with puerperal sepsis and reported that more than half of the study participants were living in rural areas and the remaining were urban residents.

In addition, This result is in accordance with ***El Sayid, et al., (2018),*** who conducted a study entitled as "Adolescents Pregnant women Perception Regarding Safe Pregnancy in Rural Areas " and clarified that, less than three-quarters of the studied pregnant women didn't have enough income.

As regards obstetrical history of the studied pregnant women, the results of the current study showed that, the mean SD of gestational age of studied pregnant women was 32.40±0.98 week. Also, less than two-thirds of them had one gravida and were nullipara and the majority of them didn't have history of abortion. this result is not in the same line with ***Mahmoud,(2022)*** who studied " Effect of Nursing Intervention Program for Women post-Caesarean Section regarding Self-Care on their Psychological status and Postoperative Pain" and clarified that, the mean SD of gestational age was 38.1±0.5.

In the same line, This results correspond to ***Gobran, et al., (2021)*** who clarified that, the most proportion of the studied pregnant women were nullipara, had one gravida and more than four fifth didn't have history of abortion. This result is in disagreement with ***Bishaw, et al., (2022)***, who mentioned that more than half of the studied pregnant women had two or more children.

Regarding complications of previous pregnancy and type of previous labor, the current study clarified that more than one-quarter of the studied pregnant women had complications of previous pregnancy, nearly two-thirds of them had anemia. In addition, more than half of the studied pregnant women who delivered before, had vaginal delivery. These results were in accordance with

Bakhtawar, et al., (2020) who conducted a study "Risk factors for postpartum sepsis: a nested case-control study" and found that, more than half of the studied pregnant women had spontaneous vaginal delivery. Also, this result differs from ***Berhe, et al., (2019)*** who studied "Prevalence of anemia and associated factors among pregnant women in A digrat General Hospital "and found that, the majority of the studied pregnant women were not anemic.

In addition, complications of previous labor and complication of previous postpartum, the results of the current study revealed that, about one-tenth of the studied pregnant women who delivered before, had complications, four-fifth of them had excessive bleeding. Regarding complication of the postpartum, less than one-fifth of the studied pregnant women who delivered, had previous postpartum complications and less than three-quarters of them had excessive bleeding. These results are similar to ***Hussein, et al., (2019)*** who conducted a study about "Pregnant women's Knowledge regarding Postpartum Warning Signs" and found that, more than three quarter had postpartum complication and more than one third of them have excessive bleeding.

Concerning to total knowledge score of the studied pregnant women regarding puerperal sepsis at pre, post intervention and follow up phases the results of the current studyrevealed that, more than one-quarter of the studied pregnant women have adequate total knowledge score regarding puerperal sepsis at pre intervention phase compare to more than three-quarters at post intervention and follow-up phases, respectively.

From my point of view, this improvement may be related to that, the educational program and educational sessions affect the knowledge of the pregnant women positively as all mothers in the sample share in the program and become more equipped by the important information about puerperal sepsis This result is similar to ***Abdelfattah, et al., (2022),*** who studied "The Effect of Instructional Guidelines Regarding Puerperal Sepsis Prevention on the Knowledge and Practice of Postpartum Mothers " and clarified that less than two third of the studied sample reported that they had unsatisfactory knowledge regarding puerperal sepsis in pre intervention, where in post and follow up test most of them had satisfactory knowledge after receiving the instructional guidelines program with a highly statistical significant difference.

Regarding studied pregnant women total self-care practices' score at pre intervention, post intervention and follow-up phases, the result of the current study displays that, about two-fifth of the studied pregnant women had satisfactory level of total practices regarding prevention of puerperal sepsis at pre intervention phase compare to more than three-quarters at post intervention and less than three-quarters at follow-up phase.

From my point of view, this improvement may be related to that all pregnant women in the sample share in the program and the written booklet supported with pictures which they considered as a reference at any time even the illiterate mothers. This result is in agreement with ***Abdelfattah, et al., (2022)*** who found that, there was a marked improvement at post intervention and follow-up phases than pre intervention phase regarding total self-care practice of studied pregnant women.

Regarding to correlation between studied pregnant women' total knowledge and self-care practices scores regarding prevention of puerperal sepsis at pre- intervention, post-intervention and follow-up phases, the results of the current study, explains that, there was a highly statistically significant positive

correlation between studied pregnant women' total knowledge and self-care practices scores regarding puerperal sepsis at pre- intervention, post- intervention and follow-up phases ($p \leq 0.001$). This may be due to the impact of pregnant women' total knowledge on their self-care practices scores regarding prevention of puerperal sepsis. This result is similar to ***Hassan, et al., (2021)***, who reported that, there is positive correlation between the knowledge and practice of postnatal mothers regarding prevention of puerperal.

Conclusion

There was a marked improvement in pregnant women' knowledge and self-care practices regarding prevention of puerperal sepsis at post intervention and follow-up phases compared to pre intervention phase with a highly statistically significant difference ($P \leq 0.001$). Finally, there was a highly statistically significant positive correlation between studied pregnant women' total knowledge and total self-care practices scores regarding puerperal sepsis at pre- intervention, post- intervention and follow-up phases ($p \leq 0.001$).Hence the aim of the study was achieved and research hypotheses were accepted.

Recommendations:

- Designing and implementing guidelines among pregnant women during third trimester and postpartum period for raising the awareness about the care during postpartum period.
- Equip the obstetrics and gynecological out-patient clinics with designed instructions booklet covering all knowledge and instructions related to improving self-care practices of pregnant women regarding prevention of puerperal sepsis.
- Further researches are needed on a larger probability sample at different settings to generalize the results.

References

Aisien, A. (2021). The Puerperium 22. *Contemporary Obstetrics and Gynecology for Developing Countries*. 257.

Abdel-fattah, N., Abdel-moniem, E., & Farrag, R. (2022). Knowledge and Practice of Postpartum Mothers Regarding Puerperal Sepsis Prevention. *Indonesian Journal of Global Health Research*.*4*(2). 323-330.

Admas, A., Gelaw, B., Worku, A., & Melese, A. (2020). Proportion of bacterial isolates, their antimicrobial susceptibility profile and factors associated with puerperal sepsis among post-partum/aborted women at a referral Hospital in Bahir Dar.Northwest Ethiopia. *Antimicrobial Resistance & Infection Control*. *9*(1).1-10.

Atlaw, D., Seyoum, K., Woldeyohannes, D., & Berta, M. (2019). Puerperal sepsis and its associated factors among mothers in University of Gondar referral hospital, Ethiopia. 2017. *International Journal of Pregnancy & Child Birth*.*5*(5). 190-195.

Axelsson,D.(2019). *Postpartuminfections.prevalence. associated obstetric factors and the role of vitamin D* (Vol. 1686). Linköping University Electronic Press.

Bakhtawar, S., Sheikh, S., Qureshi, R., Hoodbhoy, Z., Payne, B., Azam, I., ... & Magee, L. (2020). Risk factors for postpartum sepsis. a nested case-control study. *BMC pregnancy and childbirth*. *20*(1). 1-7.

Beraki, G., Tesfamariam, E., Gebremichael, A., Yohannes, B., Haile, K., Tewelde, S., & Goitom, S. (2020). Knowledge on postnatal care among postpartum mothers

during discharge in maternity hospitals in Asmara. a cross-sectional study. *BMC pregnancy and childbirth*. *20*(1). 1-10.

Berhe, B., Mardu, F., Legese, H., Gebrewahd, A., Gebremariam, G., Tesfay, K., ... & Adhanom, G. (2019). Prevalence of anemia and associated factors among pregnant women in Adigrat General Hospital.Tigrai.Northern Ethiopia.2018. *BMC research notes*. *12*(1). 1-6.

Bishaw, K., Worku, S., & Tilahun, M. (2022). Prevention of puerperal sepsis in northwest Ethiopia. Knowledge and practice of postnatal women. A multicenter cross-sectional study. *SAGE open medicine*.*10*. 20503121221085842.

El Sayid, H., Abd Ellatef, M., & Abd El Aziz, R. (2018). Adolescents Pregnant Women Perception Regarding Safe Pregnancy in Rural Areas. *Egyptian Journal of Health Care*.*9*(4). 577-591.

Farg, D., & Hassan, H. (2020). Obstetric outcomes for teenage and adult pregnancy. a comparative study. *Nursing & Care Open Access Journal*. *7*(1).1-10.

Gamel, W., Genedy, A., & Hassan, H. (2020). Impact of puerperal sepsis self-care nursing guideline on women's knowledge and practices. *American Journal of Nursing Research*.*8*(2). 132-141.

Gobran, M., Fatah, M., Ramadan, M., Amer, G. A., Rabeh, M., Elshafei, R., & Abdelbary, A. (2021). Educational Program for Pregnant Women Regarding Obstetrics Dangerous Signs in Rural Areas. *Open Journal of Obstetrics and Gynecology*.*11*(5). 529-552.

Hassan, R., Mohamed, H., & Solimen, H. (2021). Knowledge and Practices of Postnatal Mothers Regarding Prevention of Puerperal Sepsis. *Minia Scientific Nursing Journal*. *9*(1). 33-39.

Hussein, A., Mahmoud, R., & Fathy, W. (2019). Women's Knowledge regarding Postpartum Warning Signs. *Egyptian Journal of Health Care*. *10*(2).201-215.

Khanna, P., & Selvam, V. (2020). Obstetric and Gynecological Infections Infectious Diseases in the Intensive Care Unit (pp. 139-148). Springer.

Lowdermilk, D., Cashion, M., Perry, S., Alden, K., & Olshansky, E. (2019). *Maternity and Women's Health Care E-Book*. Elsevier Health Sciences. U.S.A. Pp.417-457.

Mahmoud, O. (2022). Effect of Nursing Intervention Program for Women post-Caesarean Section regarding Self-Care on their Psychological status and Postoperative Pain. *Assiut Scientific Nursing Journal*. *10*(29). 10-22.

Nchimbi, D., & Joho, A. (2022). Puerperal sepsis-related knowledge and reported self-care practices among postpartum women in Dar es salaam, Tanzania. *Women's Health*.*18* 17455057221082954.

Sarkar, R., Ahalawat, S., & Kumari, M. (2019). A Descriptive Study to Assess the Knowledge and Practices Regarding Prevention of Puerperal Infection among Postnatal Mothers in Civil Hospital, Panipat. Haryana. *International Journal of Nursing Education*.*11*(4).