

Effect of Preventive Educational Interventions on Pregnant Women's Knowledge and Self- Care Practices regarding Puerperal Sepsis

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Abstract

Background: Puerperal sepsis is considered a preventable perilous issue that associated with women's demise. Therefore, prevention is better than treatment. **This research aimed to** evaluate the effect of preventive educational interventions on pregnant women's knowledge and self-care practices regarding puerperal sepsis. **Subjects and Method:** A quasi- experimental design was exploited, the target group comprised of 120 pregnant women who were determined by a purposive sample and were selected from obstetric departments of Tanta University and El-Menshawy hospitals. **Two tools utilized:** Tool (I): Pregnant women's knowledge regarding puerperal sepsis and its prevention: It was consisted of four main parts, Tool II: Pregnant women's self- care practices assessment sheet: that involved seven categories. **Results:** Remarkable improvement in the total knowledge level of the studied pregnant women where (30%) of them had adequate knowledge pre-intervention compared to (78.5% & 75% respectively) immediately post-intervention and at the follow up as well as highly enhancement in the total scores of pregnant women self-care practices where (15%) of them had satisfactory practices pre intervention compared to (80% & 78% respectively) immediately post-intervention and at the follow up with highly statistically significant differences $P=(0.000^{**})$. **Conclusion:** prominent enhancement in pregnant women's overall knowledge and self-care practices regarding puerperal sepsis prevention. **Recommendations:** pregnant women should be adequately enriched with designed preventive nursing instructions and interventions regarding post-partum complications especially puerperal sepsis.

Keywords: Preventive educational interventions, Knowledge, Self-care practices, Puerperal sepsis

Introduction

World Health Organization reported that puerperium is the most pivotal and ignored period in women's life, thus there is a critical need to provide unique care from the initiation of pregnancy, constantly during labor and post-delivery to safeguard women's health and avert the threatening post-natal complications particularly puerperal sepsis which is considered the second dominant reason for women's morbidity and mortality especially in under-developed nations (**Wojcieszek et al., 2023 & WHO 2022**).

Puerperal sepsis is a fatal bacterial infection of the female genital tract that almost caused by group A beta – hemolytic streptococci and may occur after the rupture of membranes, during labor or within post-partum period which associated with one or two of the following symptoms including; fever, chills, headache, malaise, anorexia, pelvic pain, delayed uterine involution or offensive vaginal discharge (**Ali et al., 2024 & Seboka et al., 2024**). There are diverse factors which predispose to puerperal sepsis such as; under-nutrition, anemia, low socioeconomic status, home birth, pre-term rupture of membranes, unnecessary frequent vaginal examination, prolonged labor, cesarean section and certain obstetrical maneuvers as manual removal of placenta (**Bishaw et al., 2023 & Mengistu et al., 2023**).

Additionally, puerperal sepsis can be attributed to numerous causes such as;

endometritis, wound infection, mastitis, septic thrombophlebitis, urinary tract infection, serious birth practices (traumatic delivery, retained parts of placenta and post-partum hemorrhage) (**Geraldine, 2023**). Where the source of puerperal infection may be endogenous under poor septic conditions increase the bacterial colonization results in ascending infection while the exogenous infections comes from external contamination especially when deliveries take place without follow universal infection control measures (**Mengistu et al., 2023**).

Besides that, signs and symptoms of puerperal infection are diverge according to the source and the cause of infection where women with endometritis reported profuse and malodorous lochia whereas adnexal and /or lower uterine tenderness are elicited in bimanual uterine examination (**Mohammed, Ibrahim, Gadir, & Moula, 2020**). While women with mastitis complained from very tender, engorged and erythematous breasts, also, women with wound infections experienced erythema, edema, tenderness, and abnormal discharge from the wound as well as women with urinary tract infection had tenderness at the suprapubic area (**Teferi et al., 2024**).

Puerperal sepsis is still a major health burden for women especially in developing countries where it lead to severe morbidities like septicemia, peritonitis, shock, chronic pelvic pain, tubal infertility and eventually

mortality among neglected and poor managed women (**Habib, Ibrahim, & Jabbo, 2024, Bishaw, Worku, & Tilahun, 2022, Atlaw, Seyoum, Woldeyohannes, & Berta, 2019**). As we all realize that prevention is better than cure thus puerperal sepsis as a preventable infection can be adequately prevented through utilizing specific measures during pregnancy, labor and puerperium (**Admas, Gelaw, Belay Tessema, Worku, & Melese, 2020**).

Maternity nurses had fundamental role in preventing and decreasing the rate of puerperal sepsis by providing high quality ante, intra and post natal care for women through health promotion, psycho social services including assessment, counseling, proper referral and providing health education that help women to build up correct awareness on their health, change their unhealthy life style, early identification of risk factors, prevent illness, develop their self-care abilities, maintain their satisfaction, decrease women's anxiety and maximize their independence in performance of their daily activity (**El Shaieb, 2021, Melkie, & Dagnew, 2021**).

Puerperal sepsis can be prevented during pregnancy through educating women about the importance of receiving regular antenatal care, assessment of maternal and fetal wellbeing for early detection and referral in case of any abnormality, maintenance of personal hygiene especially hand washing, keeping

genital area clean and dry, also avoid vaginal douching to prevent ascending infection during pregnancy, improvement of general condition through adequate fluid intake and balanced nutrition to prevent anemia and strength the immune system as well as prevent infection (**Abbas, Pireh, & Yasmen, 2023, Ayele, Baye, Bishaw, & Ayele, 2023**).

Furthermore, nurses should follow aseptic precautions during labor to prevent puerperal sepsis, restrict unnecessary vaginal examination and assist physician in proper repair of the perineal laceration. Likewise, nurses must accurately teaching women measures to prevent puerperal sepsis during post-partum period such as instruct the woman how to measure vital signs, importance of early ambulation, prevent infection through (clean environment, wash hands before and after performing perineal care, change sanitary pads at least every 4 hours, dry perineum from front to back and limit visitors), eat well balanced diet, increase fluid intake, promote breast feeding and care, practice post- partum exercises, early detection of the warning signs, take adequate periods of rest and apply comfort measures that alleviate pain and enhance wound healing (**Abbas, et al., 2023, Liu, et al., 2023, Kasasa, Suubi, Ssemuwemba, & Nalubega, 2024**).

Significance of the study:

Puerperal sepsis is the main cause of women's morbidity and mortality as well as it is the barrier for attaining

the third sustainable development goal which intends to decrease maternal death. The global prevalence of puerperal sepsis is a 4.4% per100 live birth that contributes to 15% of maternal death among women during reproductive years (Tesfaye, Samuel, & Lera, 2023 & WHO, 2022).

In Egypt numerous studies reported that puerperal sepsis is the fourth cause of maternal death following postpartum bleeding, unsafe abortion and hypertensive disorders where its incidence accounts for 2.2% of maternal mortality. In spite of the accessibility of preventive interventions and management for puerperal sepsis it's still a life-threatening issue that requires a comprehensive understanding of the problem and educating the preventive interventions for pregnant women to prevent or diminish its occurrence. Accordingly, the researcher found it is a priority to educate pregnant women the preventive interventions to improve their knowledge and self-care practices regarding puerperal sepsis (Abd-Elsatar, Hasneen, Ramadan, & Ahmed, 2023 & Hafez, Amin, Mostafa, & El Sayed, 2023).

Aim of the study: was to evaluate the effect of preventive educational interventions on pregnant women's knowledge and self-care practices regarding puerperal sepsis.

Research Hypotheses

-Pregnant women's knowledge regarding puerperal sepsis is expected to be strengthened after implementation

of the preventive educational interventions.

- Pregnant women self-care practices regarding puerperal sepsis expected to be enhanced after implementation of the preventive educational interventions.

Subjects and Method

Research design: This research applied using a quasi- experimental design.

Setting: This research implemented at the antenatal outpatient clinics of obstetric and gynecological departments at: Tanta University hospital associated to the ministry of Higher Education and Scientific Research and El-Menshawy General Hospital associated to the Ministry of Health and Population.

-Each one of the above determined ante-natal clinic located on the second floor which give diagnostic, therapeutic and educational care for pregnant women from 9 a.m. to 1 p.m. every day except Friday, every clinic composed of; waiting hall for women , reception area, examination and ultrasound rooms. There is also, seminar hall where the researchers interviewed with the pregnant women that supplied with a number of seats and computer device with data show.

Subjects: The target group of the present study comprised of 120 pregnant women who were determined by a purposive sample from the above selected places depending on the number of pregnant women's receiving antenatal care at each site.

Name of the Health Care Site	The average number of pregnant women that have attended at the previous six months	Determined sample
Tanta University Hospital	220	75
El-Menshawey General Hospital	140	45
Total	360	120

The research participants were allocated according to following inclusive criteria: age varied from 18-35 years, gestational age was between 30-35 weeks, and were willing to engage in the research.

Exclusive criteria: medical or obstetrical complications during current pregnancy.

Sample calculation

$$n = \frac{z^2 pq}{e^2}$$

-e is the desired level of precision (i.e. marginal error).

-P is the estimated proportion of the population, which has the attribute in question.

- q is 1- p.

-Z=1.96

Size of the sample (with finite population correction) is equal to **120**

Tools of data collection: two tools were utilized to attain the aim of the study.

Tool (I): Pregnant women's knowledge regarding puerperal sepsis and its prevention: that was deliberated by the researchers after searching about the most pertinent

evidence based literatures to collect basic data about the participants (Abd Elmoniem, Abd-ElAliem, Sabry, & Mahmoud, 2023, Abdel-fattah, Abdel-Moniem, & Farrag, 2022, Hafez, Amin, Mostafa, & El Sayed, 2023). It was comprised of four main parts: -Part A: **Socio demographic characteristics of the pregnant women** such as; age, marital status, residence, educational level, occupation and income.

Part B: Reproductive history including: number of gravidity, gestational age, parity, abortion and antenatal follow up visits, complications of previous pregnancy, labor and postpartum period.

Part C: Pregnant women's knowledge regarding post-partum period and its complications: It was designed by the researchers to assess pregnant woman's knowledge that consisted of seven questions including; definition of postpartum period, warning signs and symptoms of (vaginal bleeding, wound infection, endometritis, deep vein thrombosis and breast problems).

Part D: Pregnant women's knowledge regarding puerperal sepsis and its prevention which contains (ten questions): definition of puerperal sepsis, risk factors, causes of puerperal sepsis, sources of infection, signs and complications of puerperal sepsis, method to prevent puerperal sepsis (generally, during pregnancy, labor and postpartum) .

Scoring system: answers of the pregnant women's for every item was

given (2) for the correct and complete answers while (1) was given for the correct and incomplete answers and (0) for incorrect and don't known answers. The total score was summed and ranked from (0-34). The total score of knowledge was categorized as:

-Adequate level of knowledge \geq 60%.

-Inadequate level of knowledge < 60 %.

Tool II: Pregnant women's self-care practices assessment sheet:

this tool was adapted from (Abd-Elatar et al., 2023), it is utilized to evaluated pregnant women's self-care practices regarding puerperal sepsis prevention that comprised of (7 categories) including: **category (1):** assessment of vital sings (6 items), **category (2):** general and perineal hygienic care (12 item), **category (3):** principles of healthy nutrition (6 item), **category (4):** postpartum exercises (6 items), **category (5):** wound care (12 item), **category (6):** breast care (12 item), **category (7):** adequate rest (6 item).

-The scoring system: the items were estimated according to three point likert scale continuum from never (1), sometimes (2) and always (3). Then calculated the scores of the items in each category and the total scores referred to the reported self-care practices that ranged from (0-180). The pregnant women's total reported self-care practices were categorized as:

-Satisfactory level of practice \geq 60%.

-Un-satisfactory level of practice < 60%.

Method

Administrative Approval

-Before initiating the study an official agreement explaining the aim of the study was attained from the responsible authority of Nursing Faculty- Tanta University and directed to the administrators of obstetric departments at Tanta University and El-Menshawy hospitals to obtain their acceptance and support for fulfilling this research.

Ethical considerations

-The scientific research ethical committee acceptance of Nursing Faculty, Tanta University for handling the study was gained; (the ethical acceptance code is: 426-3-2024).

- The researcher illustrates the study intention to each pregnant woman to attain their confidence, trust and then each pregnant woman signed on a written informed consent.

- Every pregnant woman ensured that any data gathered by the researchers will be handled with extreme security and privacy, in addition to any woman can retire from the study at any time. The researchers were secured that the nature of the study did not associated with any issues for the entire sample and the data will be only utilized for the study purpose.

Development of the tools

-Tool (I) was intended by the researchers after the comprehensive searching and examining of the pointed and latest literatures (**Abd Elmoniem et al., 2023, Abdel-fattah et al., 2022, Hafez et al., 2023**). Then it was verified by a panel consisted of five expertise in the specialty of obstetrics and gynecological nursing to examine the content validity of the tool, its clearness, transparency and applicability followed by performing the required changes. The face validity of the tool was measured based on expertise appraisal after calculating content validity index (%) of its items and it was 94.5%.

-Tool (II) was adapted from (**Abd–Elsatar et al., 2023**), the needed changes were modified followed by the translation of this tools into Arabic language.

-The reliability of the tool II were applied by the researchers through testing the internal consistency of the tools using Cronbach's Alpha Coefficient statistical test analysis, which was indicated: 0.86 for tool II (pregnant women's self- care practices assessment sheet).

-A pilot study: was accomplished on 10% of the overall sample (12) pregnant women to determine the attainability, applicability, clarity and content validity of the tools, in addition to find out any issues that may emerge when conducting the study. The pilot study was incorporated into the sample without any variations.

-Gathering of data: it commenced from the starting of April 2024 to the end of September 2024 that lasting for six months from Tanta University and El- Menshawy hospitals. The researchers were attended at the setting of data gathering three days per week on the morning shift till the required data was completed.

-The preventive educational interventions can be applied and operated through four phases:

I. Assessment phase:

-Each pregnant woman who ready to share in the current research was met individually with the researcher who initially greet her with appreciation and enthusiasm, presented her-self to each woman, also discuss the objectives of the study and get her signed acceptance.

-After that each woman was assessed using **tool I (pre-test)**, for their socio-demographic characteristics, reproductive history, knowledge regarding postpartum period, its complications, puerperal sepsis and its preventive measures, as well as pregnant women's self-care practices for preventing puerperal sepsis were assessed using **tool II (pre- test)**. This meeting took about 20-30 minutes.

II. Planning phase

-The preventive educational interventions are designed focused on the assessment requirements (knowledge deficit and improper self-care practices) of the pregnant women. Preventive educational interventions were prepared and planned after broad reviewing for the

most contemporary and newest reviews, WHO recommendations and evidence based guidelines. The preventive educational interventions planning steps included the following:

A. Establishing the aim and intentions of the preventive educational interventions

The aim was to: strength pregnant women's knowledge and enhance their self - care practices regarding prevention of puerperal sepsis to preserve and improve their health.

The intentions after implementation of the preventive educational interventions the pregnant woman will be able to: identify definition of post-partum period, its common complications, determine the risk factors and causes of puerperal sepsis, mention the signs and symptoms of puerperal sepsis, demonstrate hand washing, breast care and wound care and practice the important exercises during post- partum period.

B. The preventive educational interventions included two main parts

-Part (1) (theoretical part): was set based on the aim of the preventive educational interventions and pregnant women's knowledge deficit. It was evolved by the researchers after revising the novel and pertinent literatures (**Desire, Haven, Robert & Daniel, 2024, WHO, 2022**). That involved two sections; **section one** encompasses knowledge about definition, warning signs, symptoms of post –partum period, sings and symptoms of (vaginal bleeding,

wound infection, endometritis, deep vein thrombosis and breast problems), while **section two** entails; definition, risk factors, causes, sources of infection, signs and complications of puerperal sepsis, methods to prevent puerperal sepsis (generally, during pregnancy, labor and postpartum).

-Part (2) (clinical part): incorporates self-care practices of the pregnant women regarding prevention of puerperal sepsis such as: assessment of vital signs, general and perineal hygienic care, principles of healthy nutrition, postpartum exercises, wound care, breast care, rest and sleep).

C. Gather the scope of the preventive educational interventions

-The researchers establish a preventive educational booklet depending on the women's needs to enhance their knowledge and self-care practices regarding puerperal sepsis.

-The preventive educational interventions can be applied by the researches through utilization of various approaches such as; lecture, group discussion, posters, power point, demonstration and re-demonstration and video scenarios presentation.

Phase III. Implementation phase (Preventive educational interventions)

-The researchers were illustrated the objectives of the preventive educational interventions for the pregnant women which included 3

sessions (one session for theoretical part and two sessions for clinical part); it was fulfilled in the previously mentioned settings. The total numbers of women were (120 women) divided into small groups. Each group included 5 pregnant women (15 group at Tanta University Hospital and 9 groups at El- Menshawy General Hospital); the preventive educational interventions were operated over 3 days per week. The duration of each session ranged from 20 to 30 minutes including periods of discussion. These sessions were conducted at the morning shifts.

The sessions were as follows

-The first session: The aim of this session was to clarify the intentions of the preventive educational interventions and also supplying pregnant women with knowledge about post –partum period (definition, warning signs and symptoms of vaginal bleeding, wound infection, endometritis, deep vein thrombosis and breast problems). As well as, knowledge about definition, risk factors and causes of puerperal sepsis, sources of infection, signs and complications).

-The second session: This session intended to educate the pregnant women the demonstration for preventive self-care practices of puerperal sepsis regarding: (assessment of vital signs, general and perineal hygiene care, wound and breast care).

- The third session: This session aimed to instruct pregnant women the

preventive self-care practices of puerperal sepsis including (postpartum exercises, principles of nutrition, rest and sleep).

Phase IV: Evaluation phase (Post-test)

-Pregnant women's knowledge regarding post-partum period, puerperal sepsis preventive measures and self-care practices were evaluated before, one week and one month after implementation of the preventive educational interventions by using **Tool I part (c &d) and Tool II**.

-Comparison was done between pre and post (one week- follow up) implementation of the educational interventions in relation to pregnant women's knowledge and self -care practices.

Results

Table (1): it was obvious that the mean age of the studied pregnant women was 25.13 ± 3.45 , most (95%) of them were married and it was clear that (71.7%) of them from rural areas. Also, more than half of the studied pregnant women had secondary education, 83.3% of them were housewives and 66.7 % of the pregnant women living in extended family and their monthly income not enough.

Table (2): it was founded that (66.7%) of the studied pregnant women were primi-gravidia and the mean gestational age of them was (32.20 ± 0.88) . 73.3% of pregnant women had no parity and 93.3% of them hadn't abortion. Also, this table

shows that the mean number of the antenatal visits was (7.37 ± 0.84) . Furthermore, this table illustrates that (37.5%, 43.7%, 37.5% respectively) of the studied pregnant women had complications during previous pregnancy, labor and postpartum.

Table (3): it was noticed that (92.5%, 92.5%, 83.3%, 89.2%, 95.8%, 96.7 & 79.2 respectively) of the studied pregnant women reported incorrect and don't known answers regarding definition of post-partum period, its warning signs and symptoms of (bleeding, wound infection, endometritis, deep vein thrombosis and breast problems) pre intervention compared to evident increase in the percent of the correct and complete answers immediately post-intervention and at the follow up with highly statistically significant differences.

Table (4): It was obvious that (95%, 89.2%, 95.8%, 89.2%, 95.8 %, 96.7%, 83.3%, 93.3%, 96.7 % and 94.2% respectively) of the pregnant women reported incorrect & don't known answers regarding definition, risk factors and causes of puerperal sepsis, sources of infection, signs, complications and prevention of puerperal sepsis (general, during pregnancy, labor and postpartum) pre-intervention. While there were significant improvement in the level of women's knowledge immediately post-intervention and at the follow up where most of women reported correct and complete answers with

highly statistically significant differences $P = (0.000^{**})$.

Figure (1): It was evident that there were highly improvements in the total knowledge level of the studied pregnant women where (30%) of them had adequate knowledge pre-intervention compared to (78.5% & 75% respectively) immediately post-intervention and at the follow up with highly statistically significant differences $P = (0.000^{**})$.

Table (5): It was obvious that there were a marked improvements in all categories of pregnant women' 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 ($P = 0.000^{**}$).

Figure (2): It was significant that there was highly enhancement in the total scores of pregnant women self-care practices where (15%) of them had satisfactory practice pre intervention compared to (80% & 78% respectively) post intervention and at the follow up with a highly statistically significant difference ($P = 0.000^{**}$).

Table (6): There was positive correlation between women's overall knowledge and reported self-care practices pre, immediate and at the follow up post intervention ($r = 0.658$, $P = 0.000^{*}$).

Table (1): Pregnant women's socio-demographic characteristics (n=120)

Variables	The studied pregnant women (n=120)	
	No	%
Age (years)		
<25	50	41.7
25- <30	48	40.0
30 or more	22	18.3
Mean \pm SD	25.13 \pm 3.45	
Marital status		
Married	114	95
Widow	4	3.3
Divorce	2	1.7
Residence		
Urban	34	28.3
Rural	86	71.7
Level of education		
Read and write	20	16.7
Primary education	16	13.3
Secondary education	70	58.3
University education above	14	11.7
Occupation		
Housewife	100	83.3
Worker	20	16.7
Family type		
Nuclear	40	33.3
Extended	80	66.7
Family income per Month:		
Enough	40	33.3
Not enough	80	66.7

Table (2): Pregnant women's reproductive history (n=120)

Variables	The studied pregnant women (n=120)	
	No	%
Number of gravid:		
Primi-gravida	80	66.7
Two	30	25
Three	10	8.3
Gestational age (weeks):		
Mean ±SD	32.20 ± 0.88	
Number of parity:		
None	88	73.3
One	22	18.4
Two	10	8.3
Number of abortion:		
None	111	93.3
One time	8	6.7
Number of ante natal visits of the current pregnancy:		
Mean ±SD	7.37±0.84	
Presence of complications during previous pregnancy:(n=40)		
Yes	15	37.5
No	25	62.5
Complications during previous pregnancy (n=15):		
Pre-eclampsia.	5	33.3
Gestational diabetes	6	40
Anemia	4	26.7
Presence of complications during previous labor (n=32):		
Yes	14	43.7
No	18	56.3
Complications during previous labor (n=14)		
Prolonged labour	6	42.8
Intra-partum bleeding	4	28.6
Maternal distress	4	28.6
Presence of complications during previous postpartum period (n=32):		
Yes	12	37.5
No	20	62.5
Complications during previous postpartum period (n=12):		
Post-partum bleeding	4	33.3
Puerperal sepsis	8	66.7

Table (3): Pregnant women's knowledge about post-partum period and its complications pre, immediate post intervention and at the follow up.

Variables	The studied pregnant women (N=120)						χ^2	P
	Pre-intervention		Post- intervention					
	N	%	Immediate		Follow up			
Definition of post-partum period:								
Correct & complete	4	3.3	112	93.4	98	81.7	112.2	0.000*
Correct & incomplete	5	4.2	4	3.3	12	10.0		
Incorrect & don't known	111	92.5	4	3.3	10	8.3		
Warning signs & symptoms:								
Correct & complete	5	4.2	113	94.2	100	83.3	166	0.000*
Correct & incomplete	4	3.3	3	2.5	8	6.7		
Incorrect & don't known	111	92.5	4	3.3	12	10.0		
Signs& symptoms of bleeding:								
Correct & complete	5	4.2	115	95.8	97	80.8	133	0.000*
Correct & incomplete	15	12.5	2	1.7	12	10.0		
Incorrect & don't known	100	83.3	3	2.5	11	9.2		
Signs & symptoms of wound infection:								
Correct & complete	7	5.8	114	95	100	83.3	124.6	0.000*
Correct & incomplete	6	5	3	2.5	9	7.5		
Incorrect & don't known	107	89.2	3	2.5	11	9.2		
Signs & symptoms of endometritis								
Correct & complete	2	1.7	107	89.2	96	80	134.3	0.000*
Correct & incomplete	3	2.5	7	5.8	18	15		
Incorrect & don't known	115	95.8	6	5	6	5		
Signs& symptoms of deep vein thrombosis								
Correct & complete	0	0.0	111	92.5	95	79.2	112	0.000*
Correct & incomplete	4	3.3	3	2.5	13	10.8		
Incorrect & don't known	116	96.7	6	5	12	10.0		
Signs & symptoms of breast problems								
Correct & complete	4	3.3	115	95.8	110	91.7	154	0.000*
Correct & incomplete	21	17.5	3	2.5	4	3.3		
Incorrect & don't known	95	79.2	2	1.7	6	5		

Table (4): Pregnant women's knowledge about puerperal sepsis and its prevention pre, immediate post intervention and at the follow up.

Variables	The studied pregnant women (N=120)						χ^2	P
	Pre-intervention		Immediate Post-intervention		Follow up			
	N	%	N	%	N	%		
Definition of puerperal sepsis:								
Correct & complete	3	2.5	111	92.5	94	78.3	120.5	0.000*
Correct & incomplete	3	2.5	5	4.2	17	14.2		
Incorrect & don't known	114	95	4	3.3	9	7.5		
Risk factors:								
Correct & complete	3	2.5	105	87.5	102	85	140.3	0.000*
Correct & incomplete	10	8.3	5	4.2	12	10		
Incorrect & don't known	107	89.2	10	8.3	6	5		
Causes:								
Correct & complete	0	0.0	104	86.7	95	79.2	112	0.000*
Correct & incomplete	5	4.2	6	5	21	17.5		
Incorrect & don't known	115	95.8	10	8.3	4	3.3		
Sources of infection:								
Correct & complete	0	0.0	114	95	90	75.0	124.6	0.000*
Correct & incomplete	13	10.8	6	5	20	16.7		
Incorrect & don't known	107	89.2	0	0.0	10	8.3		
Signs:								
Correct & complete	0	0	107	89.2	96	80	134.3	0.000*
Correct & incomplete	5	4.2	10	8.3	15	12.5		
Incorrect & don't known	115	95.8	3	1.7	9	7.5		
Complications:								
Correct & complete	0	0	111	92.5	95	79.2	115	0.000*
Correct & incomplete	4	3.3	0	0	15	12.5		
Incorrect & don't known	116	96.7	9	7.5	10	20.8		
General prevention:								
Correct & complete	0	0.0	109	90.8	93	77.5	160	0.000*
Correct & incomplete	20	16.7	11	9.2	25	22.5		
Incorrect & don't known	100	83.3	0	0.0	3			
Prevention during pregnancy:								
Correct & complete	2	1.7	110	91.7	101	84.2	111	0.000*
Correct & incomplete	6	5	3	2.5	10	8.3		
Incorrect & don't known	112	93.3	7	5.8	9	7.5		
Prevention during labor:								
Correct & complete	0	0	103	85.8	100	83.3	140	0.000*
Correct & incomplete	4	3.3	8	6.7	9	7.5		
Incorrect & don't known	116	96.7	9	7.5	11	9.2		
Prevention during post- partum:								
Correct & complete	0	0.0	112	93.3	104	86.7	184	0.000*
Correct & incomplete	7	5.8	3	2.5	10	8.3		
Incorrect & don't known	113	94.2	5	4.2	6	5		

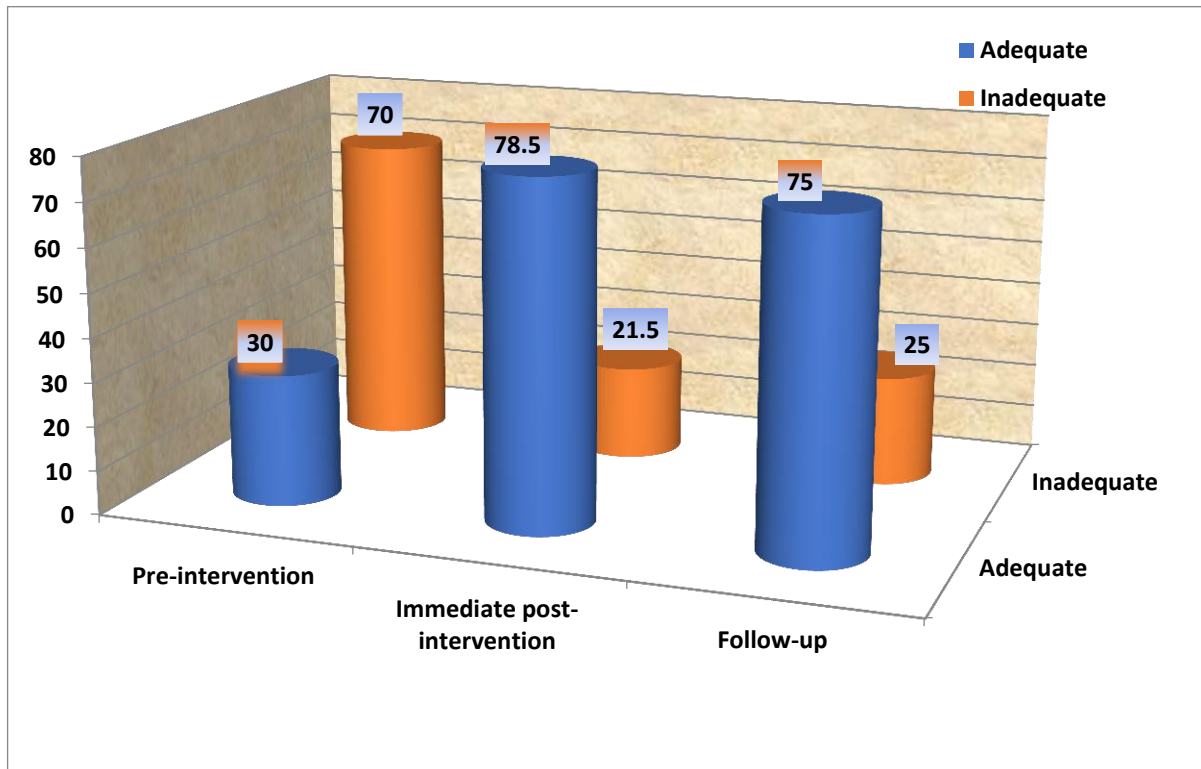


Figure (1): Total knowledge level of the studied pregnant women regarding puerperal sepsis at pre, immediate post intervention and at the follow up.

Table (5): The studied pregnant women self- care practices at pre, immediate post intervention and follow up.

Variables	The studied pregnant women(N=120)												Friedman test	
	Pre-intervention				Immediate Post-intervention				Follow-Up				2X	P
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory			
	N	%	N	%	N	%	N	%	N	%	N	%		
Assessment of vital signs.	30	25	90	75	100	83.3	20	16.7	98	81.7	22	18.3	137.0	0.000**
General and perineal hygienic care.	29	24.2	91	75.8	102	85	18	15	100	83.3	20	16.7	99.8	0.000**
Principles of healthy nutrition.	35	29.2	85	70.8	99	82.5	21	17.5	97	80.8	23	19.2	1188.6112	0.000**
Postpartum exercises.	28	23.3	92	76.7	95	79.2	25	20.8	93	77.5	27	22.5	1188.66119	0.000**
Wound care.	25	20.8	95	79.2	89	74.2	31	25.8	88	73.3	32	26.7	88.6	0.000**
Breast care.	31	25.8	89	74.2	97	80.8	23	19.2	95	79.2	25	20.8	118.6	0.000**

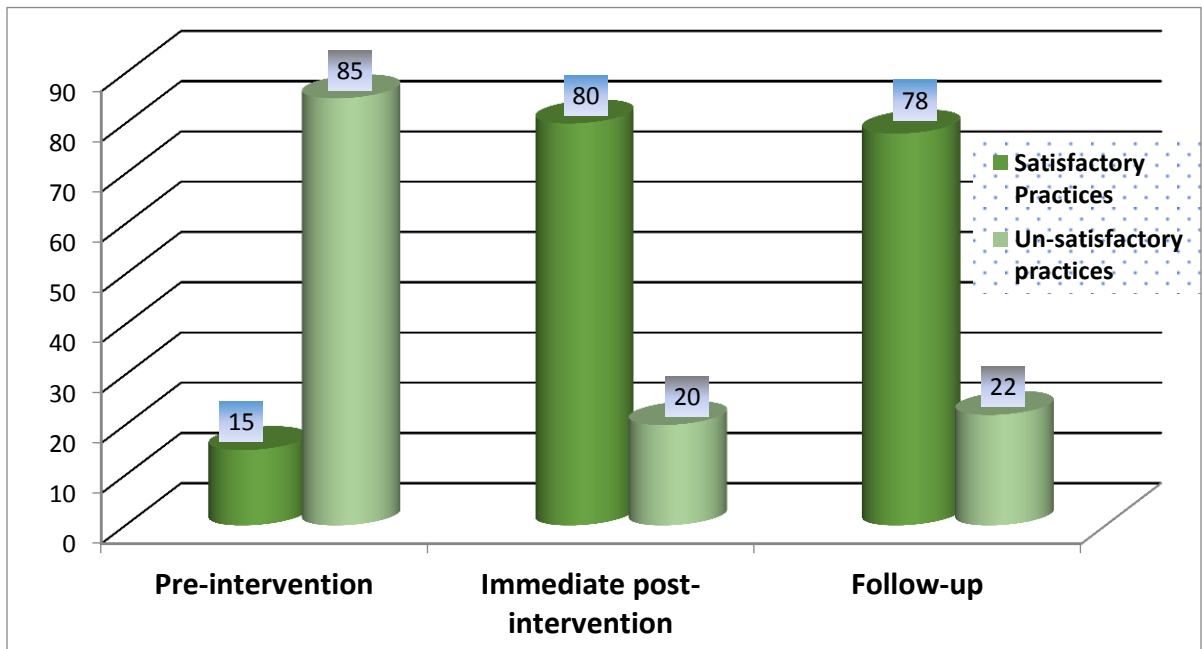


Figure (2): Total score level of pregnant women's reported self-care practices pre-intervention, immediate post-intervention and at the follow up.

Table (6): Correlation between the studied pregnant women's overall knowledge and overall reported self-care practices.

Correlation	The studied pregnant women (n=120)					
	Pre- intervention		Immediate Post-intervention		Follow-up	
	R	P	R	P	r	P
Knowledge Versus self- care practices	0.329*	0.000*	0.639*	0.000*	0.658*	0.000*

Discussion

Puerperal sepsis is a serious health problem whereas globally 6 million of women had diagnosed with puerperal sepsis and nearly 77,000 of them died from it (Ogbeye et al., 2024). Women's vulnerability to acquiring this infection is allied to diverse factors as; prolonged labor where any negligence or ignorance will lead to many hazardous complications so prevention is better than treatment (Li et al., 2023).

Therefore, health education during antenatal period is essential to strength women's knowledge and self-care practices toward puerperal sepsis as a method to reduce its prevalence and consequences (Elsayed Ahmed et al., 2023). Accordingly the current study had peel glows on the effect of preventive educational interventions on pregnant women's knowledge and self-care practices regarding puerperal sepsis.

The findings of the present study described that the pregnant studied women were nearly aligning in all elements of their socio-demographic characteristics and reproductive history, this alignment is helpful in restricting the irrelevant variables which may interfere with the effect of preventive educational interventions on pregnant women's knowledge and self-care practices.

The findings of the current study illuminated that pregnant women's knowledge concerning post-partum period and its complications obviously improved post intervention (immediate and at the follow up assessment) compared to pre-intervention. This results supported by (Abd Allah, Mohamed, & Kamel, 2023) they

evaluated the ; Impact of health educational program for pregnant women on their selected postpartum and newborn care and they clarified that there were evident improvement of women's knowledge level regarding postpartum period post-program compared to pre-program.

Again, this study results goes hand to hand with (Elsayed Ahmed et al., 2023) they studied; the effect of antenatal educational package on primi-parous women's knowledge and practices for prevention of selected aspects postpartum complications and they observed that there were deficiencies in women's knowledge regarding post-partum period pre which improved post implementation of the study.

From the researcher's point of view, this similarity between the present study and the previous studies may be due to the majority of the studies sample had low level of education, from rural areas and didn't receive health education so they had low knowledge level pre-intervention, additionally the women's knowledge improved post-intervention due to the efficacy of the educational sessions, use of simple language and the cooperation of women with the researchers.

In regard to women's knowledge about puerperal sepsis and its prevention, there was clear advancement in the level of knowledge post educational sessions. These results were parallel with (Abdel-fattah et al., 2022) they investigated; the effect of instructional guidelines regarding puerperal sepsis prevention on the knowledge and practice of postpartum mothers and they founded

that most of women reported wrong knowledge prior to the implementation of the instructional guidelines with significant improvement post implementation.

Correspondingly, that result agreed with **(Abd-Elsatar et al., 2023)** who determine the; effect of an educational program on knowledge and self-care practices of pregnant women regarding prevention of puerperal sepsis. They detected that there is a remarkable improvement in all items regarding puerperal sepsis knowledge and its prevention post intervention compared to pre intervention.

Considering, total knowledge level of the studied pregnant women in regard to puerperal sepsis and its prevention. this results posted highly improvements in the total knowledge level immediately post intervention and at the follow up compared to pre-intervention with highly statistically significant differences. This findings corresponding to the findings of **(Hafez et al., 2023)** they appraise; the effect of health instructions on pregnant women's knowledge regarding puerperal sepsis which show a positive effect of the health instructions on pregnant women's total knowledge about puerperal sepsis and its prevention.

Likewise, this study went in line with **(Abd Elmoniem et al., 2023)** who assess; the effect of utilizing care bundle on prevention of puerperal sepsis among post-natal women and summarized that the majority of the study group had good total knowledge scores for prevention of puerperal sepsis with highly statistical significance.

According to the researcher opinion, this improvement on women's level of knowledge can attribute to the positive effect of the preventive educational sessions, the careful interest of women and using the illustrated booklet.

Related to pregnant women' self-care practices regarding prevention of puerperal sepsis, there is a remarkable enhancement in all categories of pregnant women' self-care practices at post intervention and follow-up phases compared to pre intervention phase. This results partially supported by **(Desireet al., 2024)** they identify the knowledge and practice towards prevention of puerperal sepsis among postpartum women at Bwindi community hospital and they founded that the majority of women had poor practices toward prevention of puerperal sepsis.

Also, these results partially agreed with **(Hassan, Mohamed, & Solimen, 2021)** they investigated the knowledge and practices of postnatal mothers regarding prevention of puerperal sepsis and clarified that most of the participant reported poor practices about prevention of puerperal sepsis

Furthermore the present finding was matching with **(Gamel, Genedy, & Hassan, 2020)**. They studied; the impact of puerperal sepsis self-care nursing guideline on women's knowledge and practices. They illustrated that the entire study sample knowledge and self-care practices were enhanced post-intervention. Additionally, the present study findings consistent with **(Abd Elmoniem et al., 2023)** and **(Abd-Elsatar et al., 2023)**, they explained that self-care practices adequately enriched

post intervention compared to pre-intervention.

This harmony between the present study and other studies can be attributed to the use of different educational methods, understanding and commitment of the pregnant women to the preventive educational interventions. Also, the regular attendance of the sessions, the positive reinforcement, adequate retention of knowledge and the distributed illustrated booklet.

Concerning the correlation between women's overall knowledge and self-care practices in regard to puerperal sepsis and its prevention. There was positive correlation between women's overall knowledge and reported self-care practices pre, immediate and at the follow up post intervention.

This finding was in line with (**Abdel-fattah et al., 2022**) who illustrated a positive correlation between the subjects overall knowledge and practices, similarly a study conducted by (**Abd-Elatar et al., 2023**) and another study carried out by (**Hassan et al., 2021**). This congruity between the current study and the previous studies can be explained by the influence of women's knowledge on their practices.

Conclusion: Depending on the results of the existing study, it can be concluded that the aim of this study was achieved and supported its hypothesis which demonstrated that there were prominent enhancement in pregnant women's overall knowledge and self-care practices regarding puerperal sepsis prevention.

Recommendations

In the light of these study findings, we can propose the following:

-Pregnant women should be adequately enriched with designed preventive nursing instructions and interventions regarding post-partum complications especially puerperal sepsis.

-Ongoing training for maternity nurses about latest evidence based practices and novel trends regarding prevention of puerperal sepsis.

-Replicate the research on large sizeable sample in varied environments.

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