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Effect of the Educational Program about Puerperal Sepsis Prevention on knowledge and Practices of Pregnant Women

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ABSTRACT

Background: One of the main causes of maternal death and a significant public health issue is puerperal sepsis.

***Aim* of the study:** To evaluate the effect of the educational program about puerperal sepsis prevention on knowledge and practices of pregnant women.

Study design: A quasi experimental design was used.

Setting: The study was conducted in in the outpatient antenatal clinic at Zagazig University Hospital.

Study subjects: A purposive sample of 150 pregnant women.

Tools of data collection: Three tools were used; tool I. A structured interview questionnaire, tool II. Pregnant women's knowledge assessment questionnaire, and tool III. Pregnant women's practices assessment questionnaire.

Results: There was marked improvement in total women's knowledge and practices regarding puerperal sepsis prevention post intervention and two weeks after delivery compared to pre intervention with highly statistically significant difference, (P< 0.001).

Conclusion*:* Applying the educational program significantly increased women knowledge and practices regarding prevention of puerperal sepsis. Also, there was significant relation between socio demographic variables and women knowledge and practice. Moreover, positive significant correlation between women knowledge and women practices. ***Recommendations****:* The antenatal clinics should be equipped with designed instructions booklet covering all knowledge and practices related to improving of pregnant women regarding puerperal sepsis prevention introduced to the women in the third trimester of pregnancy.

Keywords: *Knowledge, Practices, Pregnant women, Puerperal sepsis prevention.*

1. INTRODUCTION

A genital tract infection known as puerperal sepsis can happen at any point between the rupture of the membrane or the commencement of labor and the 42nd day after giving birth. Increased body temperature, pelvic pain, abnormal vaginal discharge, and sub-involution are all indicators of puerperal sepsis. Upon discharge from the hospital, the majority of puerperal sepsis infections occur. In the absence of postnatal follow-up, this typically occurs 24 hours after delivery (Adelaja, 2021).

According to Bonet et al. (2020), puerperal sepsis is a major contributing factor to maternal fatalities, accounting for 11% of all maternal deaths worldwide. According to a recent study conducted in Upper Egypt to assess the impact of puerperal sepsis self-care guidelines on women's health during puerperium, postnatal infection ranks as the fourth direct leading cause of death in Egypt. The study found that 2% of the sample had puerperal sepsis (Masoud & Saber, 2022).

According to Ngonzi et al. (2021), aseptic delivery procedures, appropriate postpartum care, referral and prompt treatment of pregnancy problems, and adequate prenatal care can all help prevent puerperal sepsis. Preventing and treating puerperal infections is a task for maternity nurses. The ability to educate pregnant women about preventive measures, such as proper prenatal nutrition to control anemia and intrapartum hemorrhage, good maternal perineal hygiene with thorough hand washing, identifying women at risk for postpartum infection, and providing anticipatory teaching and counseling before and.

after discharge, as well as telephone follow-up, hot lines, support groups, lactation counselors, home visits by nurses, and instructional materials like videos and written materials, is a must for nurses working in birth centers and hospitals (Lowdermilk et al., 2021)

According to Abdel-fattah et al. (2022), self-care for pregnant women is the capacity to adjust and self-manage in order to prevent complications such as puerperal sepsis. This includes maintaining personal and vaginal hygiene, avoiding contact with people who have contagious diseases, beginning gentle exercise as soon as possible after hospital discharge, informing the doctor if there is a foul-smelling vaginal discharge or severe abdominal pain, delivering the baby in a hospital under strict aseptic precautions, practicing good nutrition, avoiding tension and anxiety, and taking pain and anti-inflammatory medications under a specialist's supervision.

Significance of the study:

The majority of postpartum infections occur after hospital discharge, often two days after birth. Many occurrences of puerperal infections go misdiagnosed and unreported when postnatal follow-up is lacking, as is the case in many underdeveloped nations. **(Isawumi et al., 2020)**. 8.0% of women in Egypt experienced puerperal sepsis, which is the third most common cause of direct maternal death after postpartum hemorrhage and hypertensive illness, according to a cross-sectional survey of women who gave birth followed by a prospective survey conducted up to the 42nd day following delivery **(Khashab et al., 2020)**. Since prevention is usually preferable than treatment, this study was carried out to assess how pregnant women's knowledge and practices were affected by the educational program regarding preventing puerperal sepsis.

AIM OF THE STUDY

The study aimed to evaluate the effect of the educational program about puerperal sepsis prevention on knowledge and practices of pregnant women.

Study hypothesis:

H1- Pregnant women's understanding of puerperal sepsis prevention would increase with the implementation of an educational program.

H2- Pregnant women's practices regarding puerperal sepsis prevention would improve with the implementation of an educational program.

SUBJECTS AND METHODS

Study design:

Pregnant women's knowledge and habits about the prevention of puerperal sepsis were assessed using a quazi experimental design (pre and post test) in one group.

Study setting:

This study was conducted at Zagazig University Hospital's outpatient prenatal clinic. Since it was the main medical facility where they obtain prenatal care, the aforementioned location was chosen. The clinic is open daily from 9 am to 1 pm, with the exception of Fridays, and offers prenatal care to many expectant mothers throughout the Sharkia Governorate.

Study Subjects:

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 Zagazig University Hospital through the study period of six months (n =150) who fulfill the following criteria

Inclusion criteria:

Pregnant women at gestational age (30-35weeks).

Free from any medical or obstetrics complication.

Exclusion criteria:

Women who refused to participate in the study.

Tools of data collection*:*

Tool I: A structured interview questionnaire

This tool included two parts

Part 1: General characteristics of pregnant women:

Such as age, level of education, occupation, residence, marital status, age at marriage and family income.

Part 2: Obstetrical history

These included gestational age at study recruitment, number of prior pregnancies, pregnancy complications, and pregnancy complications type, number of prior deliveries, delivery types, delivery complications, postpartum complications, and postpartum complications.

Tool II: Pregnant women Knowledge Assessment questionnaire for prevention of puerperal sepsis

It was consisted of 4 sections.

Section 1. Knowledge regarding postpartum period and postpartum changes

It contained 26 multiple-choice questions, including the following: (2) questions concerning the definition and duration of the postpartum period; (3) questions about uterine alterations; and (4) questions about vaginal and cervical changes. It was derived from Hamadeh et al. (2020). Five questions concerning lochia, four about breast changes, four about vital sign changes, and four about body weight changes.

Section 2. Knowledge regarding complication of the postpartum period

It was adapted from **Rashad & Essa (2023)** They contained eight multiple-choice questions about symptoms of bleeding after childbirth, frequent postpartum discomfort reported by many women, and warning indicators during the postpartum period, among other topics.

Section3. Knowledge regarding puerperal sepsis

It was adapted from **Lever & Mackenzie (2021)** and contained seventeen multiple-choice questions about the definition of puerperal sepsis, the proportion of women who suffer from it, and factors that can raise the chance of developing puerperal sepsis after giving birth, …etc.

Section 4. Knowledge regarding health care provider responsibility for prevention of puerperal sepsis

It was adapted from **Boushra & Rahman (2021)** This contained 22 multiple-choice questions about the significance of controlling blood sugar levels both throughout pregnancy and after delivery, the significance of early detection and treatment of any underlying medical issues during pregnancy, and the most crucial strategies to help prevent infections after delivery....etc

Knowledge Scoring System:

The responses of the pregnant women under study were compared to the model key responses. Each item received a score of two for a correct response and one for an incorrect response. The sum of the scores of the items in each section was used to determine the section's overall score. The entire knowledge score was categorized as follows:

Adequate level of knowledge when the total score was ≥ 60%.

Inadequate level of knowledge when the total score was < 60%

Tool III: Pregnant women practices Assessment questionnaire for prevention of puerperal sepsis

It was adapted from **Tortorice (2023)** to evaluate the methods used by expectant mothers to avoid puerperal sepsis. It was separated into two sections:

Part1. Pregnant women practices during pregnancy

It contained three behaviors about attending prenatal appointments on time, four practices about nutrition during pregnancy, three practices about exercising before pregnancy, one practice about alerting the doctor to pregnancy warning symptoms, and two practices about birth planning.

Part2. Pregnant women practices during the postnatal period

It covered (1) the practice of attending prearranged postnatal visits, (1) the practice of postnatal nutrition, (2) the practice of postpartum rest and sleep, (3) the practice of postnatal exercise, (4) the practice of beginning sex after childbirth, (9) the practice of postpartum perineal care, (5) the practice of accelerating perineal healing following episiotomy, (10) the practice of wound care following cesarean sections, and (7) the practice of breast care.

Practices Scoring System:

The three-point Likert scale continuum—never (1), sometimes (2), and always (3)—was used to evaluate the items. The standard deviation and mean were computed. Additionally, the overall practice score for women was categorized as follows:

Satisfactory level of practice when the total score was ≥ 60%.

Unsatisfactory level of practice when the total score was < 60%.

Validity of the tools:

Following preparation, three obstetrics and gynecological nursing specialists evaluated the instruments for content validity. Every suggested change to the tools was made.

Reliability:

The reliability of tools was tested using Cronbach's Alpha test as following:

Tools	Alpha Cronbach	Internal consistency
Knowledge regarding the prevention of puerperal sepsis	0.879	Good
Self care practice regarding prevention of puerperal sepsis	0.961	Excellent

Pilot study:

Prior to conducting the main investigation, a pilot study was conducted to evaluate the study's viability and the instruments' clarity. About 10% (15) of the women in the pilot sample met the predetermined requirements. The primary study sample did not include the pilot sample participants.

Field work:

The researcher visited the aforementioned study setting after obtaining all required official permission from the relevant authorities at Zagazig University Hospitals. There, she met with pregnant women who met the eligibility requirements and were willing to participate in the study. She also explained the study's objectives, reassured them about the confidentiality of the data, and obtained their written consent in order to gain their cooperation. following the conclusion of the women's prenatal clinic checkup and follow-up appointments. The researcher attended the study setting three days per week for data collection over a period of 6 months, starting from the first of December 2024 to the end of May 2025. The study was conducted through four phases: Preparatory, planning, implementation, and evaluation.

Preparatory phase:

The construction of the research instruments was the focus of this phase. Using a pretest interviewing questionnaire and an observational checklist, the researcher conducted private, one-on-one interviews with pregnant women in the third trimester of pregnancy who were more than 30 weeks along in order to provide them with an orientation regarding the purpose of the educational program and to gauge their level of knowledge and self-care practices. Between 20 and 30 minutes were spent filling out the questionnaire and checklist.

Planning and implementation phase:

based on the needs of women as determined by the pilot study, evaluation stage, and pertinent literature analysis. The "educational booklet" was created by the researcher as a supporting resource. To make it easier for women to grasp, the researcher created it in plain Arabic and added photos for additional illustrations. The scientific committee approved its contents, which were then intended to be given to the expectant mothers during the first educational session as a guide to enhance their understanding and self-care techniques with reference to preventing puerperal sepsis.

Prior to implementing the educational sessions, the researcher aimed to facilitate the teaching method. The pregnant women were divided into six groups, with 25 women in each subgroup. Eight interactive sessions were used to carry out the educational program; the length of each session varied from 30 to 45 minutes, depending on the women's physical and mental preparedness as well as other factors in the study environment. The researcher scheduled these meetings for follow-up with pregnant women on Mondays and Wednesdays, from 9:00 am to 1 pm, twice a week. For each group, the program lasted for over a month. After then, it was done again with a different set of ladies until the sample size was reached.

The content of the sessions were as following:

Session (1) definition of postpartum period, its duration and physiological changed that occur during the postpartum period. **Session (2**) reproductive changes and complications that occur during the postpartum period. **Session (3)** definition of puerperal sepsis, symptoms and mode of transmission of infection to the genital tract. **Session (4)** sites of infection and risk factors of puerperal sepsis. **Session (5)** the role of the health care team in prevention of puerperal sepsis before child birth. **Session (6)** the role of the health care team in prevention of puerperal sepsis during and after child birth. **Session (7)** self care practices during pregnancy to prevent puerperal sepsis. **Session (8)** self care practices during postpartum period to prevent puerperal sepsis.

An overview of the previous session and the goals of the current one was given at the beginning of each one. Teaching strategies that worked well for small-group instruction included group discussions, demonstrations, and re-demonstrations. Additionally, appropriate teaching techniques such as PowerPoint presentations, movies, images, and lab models were employed during the instructional sessions.

Evaluation Phase:

Pregnant women's knowledge was assessed using the same pretest tools for a post-test administered immediately following the start of the educational program and two weeks after delivery. Pregnant women's practices were assessed by phone calls, What's App, or when they returned for postnatal visits two weeks after giving birth.

Administrative design:

In order to get the competent authorities of the study setting to approve the gathering of data, the faculty of nursing submitted an official letter to them. To get their participation, the nursing and medical professionals who were in charge of care for the women were contacted.

Ethical considerations:

Ethical approval was obtained from the scientific and ethics committee of the faculty of nursing, Zagazig University. The ethical code was (M.D ZU-NUR/147/9/3/2024). Every ethical concern was taken into account at every stage of the research. Women were also given the assurance that the data collected for the study would be kept private and utilized exclusively for research.

Statistical Analysis:

The statistical software program SPSS 22.0 was used for data entry and statistical analysis. Descriptive statistics were used to display the data: means, standard deviations, and medians for quantitative variables, and frequencies and percentages for qualitative variables. In order to evaluate the internal consistency of the generated tools, the Cronbach alpha coefficient was computed. A chi-square test (X2) was used to compare qualitative category variables. In 2x2 tables, the Fisher exact test was employed whenever the predicted values in one or more of the cells were less than 5. The associations between ranking and quantitative variables were evaluated using the Spearman rank correlation. A p-value of less than 0.05 was deemed statistically significant.

2. RESULTS

Table (1) reveals that 72.0% of the women in the study were between the ages of 20 and 30. Their mean age was 25.93± 4.11 years. In terms of education, 42.0% of them had completed secondary school. Eighty percent of them were housewives as well. Additionally, 58.0% of them reside in cities. Moreover, of them, 98.0% were married. Additionally, 56% of them had insufficient household income.

Table (2) shows that the gestational age mean SD was 32.16± 0.71 weeks. Additionally, 20.0% of the women in the study had previously been pregnant. Additionally, 15.0% of women had anemia and 33.0% experienced prior pregnancy problems. In addition, 13.3% of the women in the study had previously given birth. Additionally, 10.0% of women experienced extended labor, 13.0% experienced problems from a prior delivery, and 18.0% gave birth via cesarean section. Additionally, 7.0% of women with a history of childbirth experienced urinary tract infections, and 11.0% experienced postpartum problems.

Table (3) demonstrates that the overall level of women's knowledge regarding puerperal sepsis has significantly improved after the implementation of the educational program and two weeks after delivery. The difference between the pre and post implementation of the educational program and two weeks after delivery is highly statistically significant (P=<0.001). Before the start of the educational session, only 26.0% of the women in the study knew enough about puerperal sepsis. shifted to 75.3% two weeks after delivery and 87.0% once the educational program was put into place.

Figure (1): demonstrates that the overall level of women's knowledge regarding puerperal sepsis has significantly improved after the implementation of the educational program and two weeks after delivery. The difference between the pre and post implementation of the educational program and two weeks after delivery is highly statistically significant (P=<0.001). As proof, only 26.0% of the pregnant women in the study knew enough about puerperal sepsis overall before the teaching program was put into place. changed to 75.3% two weeks after delivery and 78.0% once the instructional program was put into place.

Table (4) demonstrates that the overall level of women's knowledge regarding puerperal sepsis has significantly improved after the implementation of the educational program and two weeks after delivery. The difference between the pre and post implementation of the educational program and two weeks after delivery is highly statistically significant (P=<0.001). As proof, only 26.0% of the pregnant women in the study knew enough about puerperal sepsis overall before the teaching program was put into place. changed to 75.3% two weeks after delivery and 78.0% once the instructional program was put into place.

Figure (2): demonstrates a very statistically significant difference (P=<0.001) between pre and two weeks postpartum in the overall improvement in women's self-care behaviors with regard to puerperal sepsis. As proof, only 30.0% of the pregnant women in the study had adequate levels of self-care practices in relation to puerperal sepsis prior to the start of the educational program. Two weeks after delivery, it shifted to 77.3%.

Table (5) shows that the sociodemographic factors of pregnant women, such as age, education, occupation, location, marriage age, and family income, have a highly statistically significant relationship with their total knowledge at pre-intervention (P=< 0.01). Nevertheless, there is no statistically significant correlation between the marital status of pregnant women at the time of the intervention and their total knowledge (P= > 0.05).

Table (6) indicates a statistically significant relationship between the post-intervention total knowledge of pregnant women and their age, education, occupation, place of residence, marriage age, and family (P=<0.05). However, there is no statistically significant correlation between the marital status of pregnant women at the time of the intervention and their overall knowledge (P= > 0.05).

Table (7) indicates a statistically significant relationship between the overall knowledge of pregnant women two weeks postpartum and their age, education, occupation, place of residence, marital age, and family income (P=<0.05). However, there is no statistically significant correlation between the marital status of pregnant women at two weeks and their overall knowledge (P= > 0.05).

Table (8) indicates that the pre-intervention self-care behaviors of all pregnant women and their sociodemographic attributes, including age, education, occupation, domicile, marriage age, and family income, have a highly statistically significant relationship (P=< 0.01). However, there is no statistically significant correlation between the marital status of pregnant women and their overall self-care behaviors before to the intervention (P= > 0.05).

Table (9) indicates that there is a statistically significant relationship between the total self-care practices of pregnant women two weeks postpartum and their age, family income, occupation, domicile, marriage age, and educational attainment (P=<0.05). However, there is no statistically significant correlation between the marital status of pregnant women at the follow-up intervention and their overall self-care behaviors (P= > 0.05).

Table (10) explains the high and statistically significant beneficial association between pregnant women's self-care habits and their knowledge before the intervention and two weeks after delivery (P=< 0.01).

DISCUSSION

In order to prevent or identify postpartum infections, recent studies have focused on the role of health professionals and policies in implementing new and proven modalities of care in applying the preventive measures of puerperal sepsis. These include educating and equipping postnatal women with health practices during hospitalization and after discharge, telephone follow-up, hot lines, lactation counselors, home visits by nurses, and teaching materials (written materials, videos) **(Plante et al., 2019).**

Therefore, the purpose of this study was to assess how pregnant women's knowledge and practices were affected by the training program regarding preventing puerperal sepsis. Sociodemographic characteristics, obstetric history, women's knowledge about preventing puerperal sepsis, women's self-care practices regarding prevention of puerperal sepsis, and the relationship and correlation between the variables under investigation comprised the six main sections that discussed the current study's findings.

The current study revealed that the majority of the women under examination were in the 20–30 age range, with an average age of 25.93± 4.11 years. Nearly three out of four of them have completed secondary and university school. They were mostly housewives, too. Furthermore, nearly half of them reside in cities. Besides, almost all of them were married. Additionally, almost half lacked a suitable household income.

In the same line, **Gamel et al. (2020)** At the postpartum unit of Fayoum General and University Hospitals in Egypt, a study titled "Impact of Puerperal Sepsis Self-Care Nursing Guideline on Women's Knowledge and Practices" found that the majority of the women in the study were secondary and university educated, with less than one-third of them being between the ages of 20 and 30. Most of them lived in cities, were married, and were housewives in general. According to the researcher, these parallels could be explained by similar cultural norms and community conditions.

Moreover, the same Socio-demographic characteristics were reported in a prospective cohort study of **Bishaw et al., (2023)** pertaining to "Incidence and predictors of puerperal sepsis among postpartum women at Debre Markos comprehensive specialized hospital, northwest Ethiopia"; the majority of the women who took part in the study were married, between the ages of 20 and 29, and had only a secondary, university, or diploma degree. They were also housewives with inadequate monthly incomes.

Pertaining obstetric history of the studied women, According to the current study, the average gestational age at recruitment was 32.16± 0.71 weeks. Additionally, one-fifth of the women in the study had previously been pregnant. Furthermore, less than one-fifth of the women had anemia, and nearly one-third had experienced pregnancy problems in the

past. Additionally, fewer than one-fifth of the women in the study had previously given birth via cesarean section, experienced problems from a previous delivery or postpartum period, and had a reduced rate of urinary tract infections.

Similarly, **Abd Elmoniem et al. (2023)** The same findings were found in a study conducted at Benha University Hospital in Egypt on the "Effect of utilizing care bundle on prevention of puerperal sepsis among post-natal women" at the postnatal room (recovery room) and the obstetrics and gynecology department outpatient clinic. One-fourth of the women in the study group had previously given birth via caesarean section, and over half of them were primigrvida. Additionally, the same proportion of postpartum problems and protracted labor.

The "Effectiveness of Puerperal Sepsis Self- Care Guideline on Women's Health during Pueriperium" study, conducted at BeniSuef General Hospital in Egypt, partially supports the current study **Masoud & Saber (2020)** They reported that while the percentages of gravidity, parity, and prior pregnancy problems were the same, the most frequent consequence was hypertension from prior pregnancies. Primary postpartum hemorrhage was the most frequent complication, but it also reported the same percentage of previous delivery difficulties with a larger percentage of obstructed labor and the same number of previous postpartum issues.

Towards total knowledge about puerperal sepsis prevention, The current study found that women's overall knowledge of preventing puerperal sepsis was much higher two weeks after birth and after the educational program was implemented than it was before (P=0.000). According to the results of the current investigation, **Abd Elmoniem et al. (2023)** verified that following the implementation of the care bundle prevention of puerperal sepsis, the study group's overall knowledge score increased significantly over the course of three phases (immediately after delivery, after weeks, and after 40 days of delivery) compared to the control group during the three phases without the care bundle. In order to help women better understand the information provided on preventing puerperal sepsis, the researcher showed increases in the effectiveness of workshops, videos, and illustrated books.

Also, these results agreed with **Belgundkar & Heikham (2021)** The researcher who carried out "a study to assess the effect of nurse intervention program on knowledge about prevention of puerperal infection among post-natal mothers at Belagavi Karnatak" reported that, prior to the intervention, the majority of post-natal mothers lacked adequate knowledge, less than one fifth had moderate knowledge, and none had adequate knowledge. However, following the intervention, none of the mothers had inadequate knowledge, nearly one-fourth had moderate knowledge, and nearly three-fourths had adequate knowledge.

As for total level of self-care practices The current study found that the total mean score of women's pretest practices was considerably higher two weeks after birth in terms of preventing puerperal sepsis. In other words, compared to the majority of women after two weeks of birth, less than one-third of the pretest women had a good level of practice.

In keeping with the study pretest, Hassan et al. (2021) conducted a descriptive study at the postnatal department of Minia University Hospital for Obstetric and Pediatric in Egypt titled "Knowledge and Practices of Postnatal Mothers Regarding Prevention of Puerperal Sepsis." The study showed that most of the sample under investigation had inadequate practices regarding puerperal sepsis prevention. Additionally, it was revealed that the majority of women in the post-intervention and follow-up periods had significantly improved their overall satisfaction with self-care practices addressing the prevention of puerperal sepsis, compared to almost one-third of women in the pre-intervention period **Abdel-fattah et al. (2022) and Abd-Elsatar et al. (2023)** which coincided well with the present study findings.

Concerning relationship between socio-demographic characteristics of the studied pregnant women and their knowledge on preventing puerperal sepsis during the pre-, post-, and follow-up stages. The current study found a highly statistically significant relationship between the sociodemographic characteristics of pregnant women, including age, education, occupation, residence, marriage age, and family income, and their total knowledge at pre-intervention, post-intervention, and two weeks after delivery (P=< 0.01). The investigation of **Masoud & Saber (2020)** concurred with the results of the current study, which evaluated the mean knowledge score of puerperal sepsis in connection to educational attainment both before and after the intervention. It was discovered that the more the education, the higher the mean score.

On the other hand, **Gamel et al. (2020)** observed that women's overall knowledge improved both immediately after the intervention and for a month after that, irrespective of their demographic characteristics. Nevertheless, there is no statistically meaningful improvement. In contrast to the current study, women's pretest knowledge was substantially correlated with age, income, occupation, and educational attainment. However, these sociodemographic characteristics had no effect on the improvement in women's knowledge in the posttest or two weeks following birth, as approved by **Abdel-fattah et al. (2022)**. According to this research, any sociodemographic hurdles can be overcome by attending and comprehending educational sessions that are conducted in a basic Arabic language with the use of illustrative images and videos.

Concerning relationship between socio-demographic characteristics of the studied pregnant women and their practice on preventing puerperal sepsis during the pre-, post-, and follow-up stages. The current study found a highly statistically significant relationship between the sociodemographic characteristics of pregnant women, including age, education, occupation, residence, marriage age, and family income, and their overall practices before, during, and two weeks after delivery (P=< 0.01). **Hassan et al. (2021)** somewhat concur with the current study's pretest, which showed a substantial

favorable relationship between women's educational attainment and their overall level of practice in preventing puerperal sepsis. Other sociodemographic factors, such as women's age, occupation, and place of living, did not significantly correlate with the overall level of practice.

In contrast to the current study, women's pretest practice level was substantially correlated with age, income, occupation, and educational attainment. However, these sociodemographic characteristics had little effect on the improvement in women's practices in the posttest or two weeks following birth, as confirmed by **Abdel-fattah et al. (2022).**

The current study found a statistically significant positive link between pregnant women's self-care habits and their knowledge at the pre-test and two weeks postpartum (P=< 0.01). These pretest results were identical to those that were disclosed by **Hassan etal. (2021)**. The findings of **Abd Elmoniem et al. (2023)** go in the same direction and demonstrated that the study group's knowledge and care packages prevention of puerperal sepsis practices score across the three phases (immediate postnatal, two weeks, and forty days postnatal) had a strong statistically significant link. Along with the outcomes supplied by ***Baharin, & Ghani, (2022)*** found a good correlation between knowledge and practice after looking at "mothers' knowledge, attitudes, and practices regarding maternal sepsis in Kuantan, Malaysia" (r = 0.236, p = 0.018).

Also congruent with a cross sectional study conducted by ***Bishaw et al., (2022)*** regarding "Preventing puerperal sepsis in Ethiopia's northwest: postpartum women's knowledge and practice" and revealed that those who had formal education and access to adequate information were 2.46 and 2.34 times more likely, respectively, to have effective preventive measures against puerperal sepsis than those who did not. Additionally, these findings were validated by **Abdel-fattah et al. (2022)**. This resemblance to the current findings demonstrated how, on the one hand, a lack of knowledge negatively accompanied by poor practices toward personal hygiene, maintaining a healthy lifestyle, and following the instructions to prevent puerperal infections, and, on the other hand, how knowledge and practice of preventing sepsis in the early postpartum period affect one another broadly.

CONCLUSION

The current study's results indicate that the research hypothesis was fulfilled. The implementation of the educational program considerably improved women's understanding of the postpartum period, postpartum changes, and postpartum problems, as well as all aspects of preventing puerperal sepsis. Additionally, implementing the training program greatly enhanced women's postpartum and pregnancy self-care behaviors with reference to preventing puerperal sepsis. Additionally, women's overall knowledge and practice level about preventing puerperal sepsis before, during, and after two weeks of delivery showed a very statistically significant favorable link.

RECOMMENDATIONS

In the light of the present study findings, it can be recommended that:

Prenatal clinics should have a specially created booklet that has all the information and guidelines needed to help pregnant women improve their self-care habits with reference to preventing puerperal sepsis. This booklet should be given to women in the third trimester of pregnancy.

The study can be repeated in a different setting with a larger sample.

Table (1): Number and percentage distribution of the studied pregnant women according to their socio-demographic characteristics (n=150).

Socio-demographic characteristics	No.	%
Age (Years)		
<20	9	6.0
20-<30	**108**	**72.0**
≥30	33	22.0
Mean ± SD	25.93± 4.11	
Educational level		
Illiterate	6	4.0
Basic education	27	18.0
Secondary education	**63**	**42.0**

University education	54	36.0
Occupation		
Housewife	**120**	**80.0**
Working	30	20.0
Residence		
Urban	**87**	**58.0**
Rural	**63**	42.0
Marital status		
Married	**147**	**98.0**
Widow	3	2.0
Age at marriage		
<20	18	12.0
20-<30	**118**	**78.7**
≥30	14	9.3
Family income		
Sufficient	66	44.0
Not sufficient	**84**	**56.0**

Table (2): Number and percentage distribution of the studied pregnant women according to their obstetric history (n=150).

Obstetric history	No.	%
Gestational age at recruitment in the study (Weeks)		
30-31	41	27.3
32-33	**81**	**54.0**
34-35	28	18.7
Mean ± SD	32.16± 0.71	
Number of previous pregnancies		
None	111	74.0
One	**30**	**20.0**
Two	3	2.0
Three or more	6	4.0
Complications of previous pregnancy (n= 39)		
Yes	**33**	**33.0**
No	6	6.0
Type of previous pregnancy complications (n=33)		

Hypertension	3	3.0
Anemia	**15**	**15.0**
Gestational diabetes	9	9.0
Antepartum hemorrhage	6	6.0
Number of previous deliveries		
None	121	80.7
One	**20**	**13.3**
Two	9	6.0
Types of previous delivery (n=29)		
Vaginal	11	11.0
C.S	**18**	**18.0**
Complications of previous delivery (n=29)		
Yes	**13**	**13.0**
No	16	16.0
Types of previous delivery complications (n=13)		
Prolonged labor	**10**	**10.0**
Shoulder dystocia	3	3.0
Complications of previous post-partum (n=29)		
Yes	**11**	**11.0**
No	18	18.0
Types of previous postpartum complications (n=11)		
Postpartum hemorrhage	2	2.0
Urinary tract infection	**7**	**7.0**
Failure of lactation	4	4.0

(*) Mutual response more than 100% (women have more than one answers).

Table (3) Comparison between the studied pregnant women regarding to adequate total score of knowledge subscales about puerperal sepsis prevention at pre, post intervention and after two weeks of delivery (n=150).

Knowledge subscales	Pre-intervention		Post-intervention		After two weeks		X^2	P-value
	Adequate		Adequate		Adequate			
	No.	%	No.	%	No.	%		
Postpartum period and postpartum changes	30	20.0	117	78.0	116	77.3	136.93	0.000**
Complications of the postpartum period	44	29.3	111	74.0	109	72.7	86.91	0.000**
Puerperal sepsis	30	20.0	123	82.	117	78.0	150.50	0.000*

				0				*
health care provider responsibility	28	18.7	115	76.7	113	75.3	134.08	0.000**
Total knowledge score	39	26.0	117	78.0	113	75.3	106.98	0.000**
Mean ± SD	26.24±12.64		59.93±11.61		59.28±12.22		Fr=262.54	0.000**

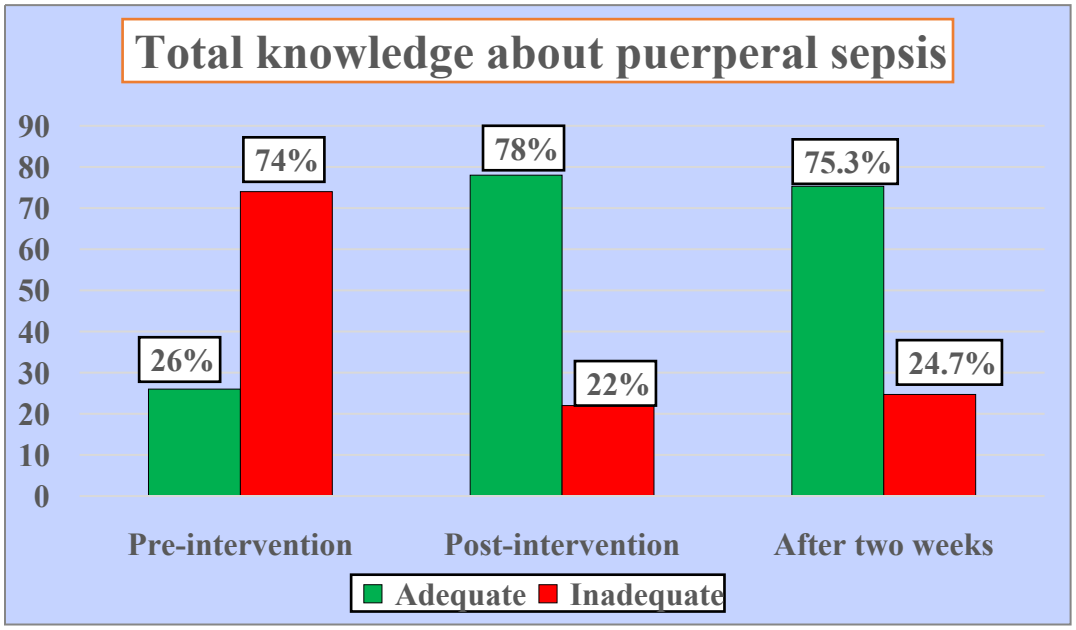

Figure (1): Percentage distribution of total pregnant women knowledge about puerperal sepsis at pre, post intervention and after two weeks of delivery (n=150).

Table (4) Comparison between the studied pregnant women regarding to total self-care practices regarding puerperal sepsis prevention at pre and after two weeks of delivery (n=150).

Self-care practices subscales	**Pre-intervention**				**After Two weeks**				**X^2**	**P- value**
	Satisfactory		**Unsatisfactory**		**Satisfactory**		**Unsatisfactory**			
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**		
During pregnancy	47	31.3	103	68.7	124	82.7	26	17.3	122.57	0.000**
Postnatal period	25	16.7	125	83.3	114	78.0	36	24.0	146.66	0.000**
Breast care	39	26.0	111	74.0	130	86.7	20	13.3	169.91	0.000**
Total self-care practices score	45	30.0	105	70.0	116	77.3	34	22.7	101.22	0.000**
Mean ± SD	45.52±20.56				98.48±23.04				Fr=247.61	0.000**

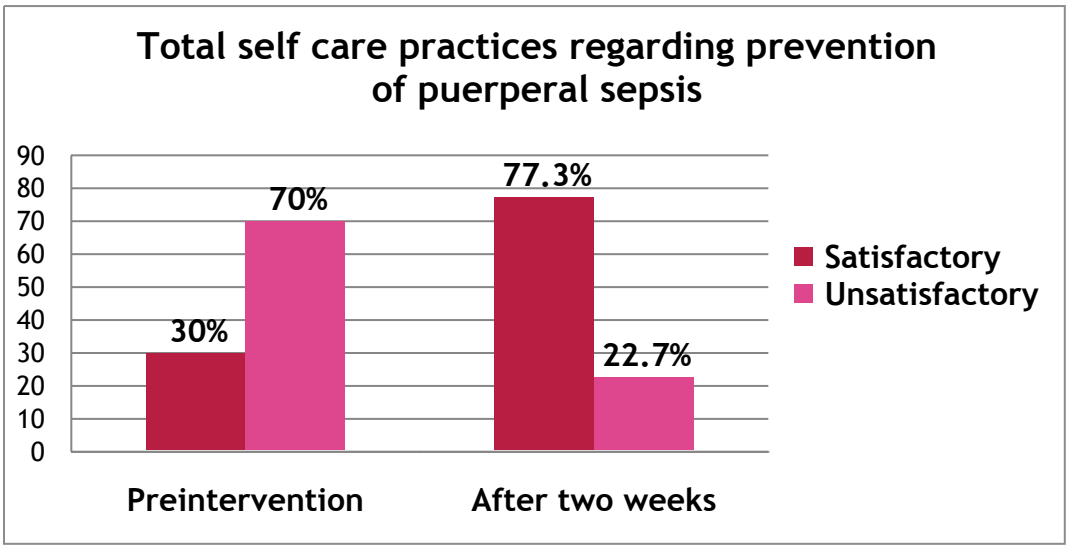

Figure (2): Percentage distribution of total women's practices regarding prevention of puerperal sepsis at pre, post intervention and after two weeks of delivery (n=150).

Table (5): Relationship between socio-demographic characteristics of the studied pregnant women and their total knowledge at pre intervention phase (n=150).

Socio-demographic characteristics		Levels of total knowledge pre- intervention				X^2	P-Value
		Adequate (n=39)		Inadequate (n=111)			
		No.	%	No.	%		
Age (Years)	18-25	0	0.0	9	8.1	20.49	0.000**
	26-33	39	100.0	69	62.2		
	34-40	0	0.0	33	29.7		
Educational level	Illiterate	0	0.0	6	5.4	39.69	0.000**
	Basic	0	0.0	27	24.3		
	Secondary	0	0.0	63	56.8		
	University	39	100.0	15	13.5		
Occupation	Housewife	18	46.2	102	91.9	37.73	0.000**
	Working	21	53.8	9	8.1		
Residence	Urban	39	100.0	48	43.2	38.16	0.000**
	Rural	0	0.0	63	56.8		
Marital status	Married	39	100.0	108	97.3	1.076	0.300
	Widow	0	0.0	3	2.7		
Marriage age	<20	0	0.0	18	16.2	14.29	0.000**
	20-<30	39	100.0	79	71.2		
	≥30	0	0	14	12.6		

Family income	Sufficient	39	100.0	27	24.3	67.07	0.000**
	Insufficient	0	0.0	84	75.7		

Table (6) Relationship between socio-demographic characteristics of the studied pregnant women and their total knowledge at post intervention phase (n=150).

Socio-demographic characteristics		**Levels of total knowledge post- intervention**				**X^2**	**P-Value**
		Adequate (n=117)		**Inadequate (n=33)**			
		No.	**%**	**No.**	**%**		
Age (Years)	18-25	0	0.0	9	27.2	43.33	0.000**
	26-33	96	82.1	12	36.4		
	34-40	21	17.9	12	36.4		
Educational level	Illiterate	0	0.0	6	18.2	150.0	0.000**
	Basic	0	0.0	27	81.8		
	Secondary	63	53.8	0	0.0		
	University	54	46.2	0	0.0		
Occupation	Housewife	87	74.4	33	100.0	10.57	0.000**
	Working	30	25.6	0	0.0		
Residence	Urban	87	74.4	0	0.0	58.42	0.000**
	Rural	30	25.6	33	100.0		
Marital status	Married	114	97.4	33	100.0	0.863	0.353
	Widow	3	2.6	0	0.0		
Marriage age	<20	0	0.0	18	54.5	81.57	0.000**
	20-<30	109	93.2	9	27.3		
	≥30	8	6.8	6	18.2		
Family income	Sufficient	60	51.3	6	18.2	11.44	0.000**
	Insufficient	57	48.7	27	81.8		

Table (7) Relationship between socio-demographic characteristics of the studied pregnant women and their total knowledge after two weeks of delivery (n=150).

Socio-demographic characteristics	**Levels of total knowledge after two weeks**		**X^2**	**P-Value**
	Adequate (n=113)	**Inadequate (n=37)**		

		No.	%	No.	%		
Age (Years)	18-25	0	0.0	9	24.4	48.24	0.000**
	26-33	96	85.0	12	32.4		
	34-40	17	15.0	16	43.2		
Educational level	Illiterate	0	0.0	6	16.2	129.8	0.000**
	Basic	0	0.0	27	73.0		
	Secondary	59	52.2	4	10.8		
	University	54	47.8	0	0.0		
Occupation	Housewife	83	73.5	37	100.0	12.27	0.000**
	Working	30	26.5	0	0.0		
Residence	Urban	86	76.1	1	2.7	61.65	0.000**
	Rural	27	23.9	36	97.3		
Marital status	Married	110	97.3	37	100.0	1.002	0.317
	Widow	3	2.7	0	0.0		
Marriage age	<20	0	0.0	18	48.6	69.29	0.000**
	20-<30	105	92.9	13	35.1		
	≥30	8	7.1	6	16.2		
Family income	Sufficient	60	53.1	6	16.2	15.38	0.000**
	Insufficient	53	46.9	31	83.8		

Table (8) Relationship between socio-demographic characteristics of the studied pregnant women and their total self-care practices at pre, post intervention and after two weeks of delivery (n=150).

Socio-demographic characteristics		**Levels of total self-care practices pre intervention**				**X^2**	**P-Value**
		Satisfactory (n=45)		**Unsatisfactory (n=105)**			
		No.	**%**	**No.**	**%**		
Age (Years)	18-25	0	0.0	9	8.6	25.00	0.000**
	26-33	45	100.0	63	60.0		
	34-40	0	0.0	33	31.4		
Educational level	Illiterate	0	0.0	6	5.7	114.2	0.000**
	Basic	0	0.0	27	25.7		
	Secondary	0	0.0	63	60.0		
	University	45	100.0	9	8.6		

Occupation	Housewife	24	53.3	96	91.4	28.57	0.000**
	Working	21	46.7	9	8.6		
Residence	Urban	45	100.0	42	40.0	46.55	0.000**
	Rural	0	0.0	63	60.0		
Marital status	Married	45	100.0	102	97.1	1.312	0.252
	Widow	0	0.0	3	2.9		
Marriage age	<20	0	0.0	18	17.1	17.43	0.000**
	20-<30	45	100.0	73	69.6		
	≥30	0	0.0	14	13.3		
Family income	Sufficient	45	100.0	21	20.0	81.81	0.000**
	Insufficient	0	0.0	84	80.0		

Table (9) Relationship between socio-demographic characteristics of the studied pregnant women and their total self-care practices after two weeks of delivery (n=150).

Socio-demographic characteristics		**Levels of total self-care practices after two weeks**				**X^2**	**P-Value**
		Satisfactory (n=116)		**Unsatisfactory (n=34)**			
		No.	**%**	**No.**	**%**		
Age (Years)	18-25	0	0.0	9	26.5	44.20	0.000**
	26-33	96	82.8	12	35.3		
	34-40	20	17.2	13	38.2		
Educational level	Illiterate	0	0.0	6	17.6	144.3	0.000**
	Basic	0	0.0	27	79.4		
	Secondary	62	53.4	1	2.9		
	University	54	46.6	0	0.0		
Occupation	Housewife	86	74.1	34	100.0	10.99	0.000**
	Working	30	25.9	0	0.0		
Residence	Urban	87	75.0	0	0.0	60.71	0.000**
	Rural	29	25.0	34	100.0		
Marital status	Married	113	97.4	34	100.0	0.897	0.344
	Widow	3	2.6	0	0.0		
Marriage age	<20	0	0.0	18	52.9	78.22	0.000**
	20-<30	108	93.1	10	29.4		

	≥30	8	6.9	6	17.6		
Family income	Sufficient	60	51.7	6	17.6	12.39	0.000**
	Insufficient	56	48.3	28	82.4		

Table (10): Correlation between total pregnant women' knowledge and self-care practices at pre, post implementation of educational program and after two weeks of delivery (n=150).

Variables		Total self-care practices score	
		Pre intervention	After two weeks
Total knowledge score	r	0.976	0.940
	p	0.000**	.000**

R= coefficient correlation test p= p-value **highly significant at p ‹ 0.01..

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