

# Impact of Puerperal Sepsis Self-Care Nursing Guideline on Women's Knowledge and Practices

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**Abstract Background:** Over 30.000 maternal deaths were referred to as postpartum sepsis; which consider as the third most frequent cause of approximately 290.000 maternal deaths worldwide. Puerperal sepsis is an important public health problem which is a leading cause of maternal death, especially, in developing countries due to the lack of knowledge on preventive methods. This study **aimed** to investigate the impact of puerperal sepsis self-care nursing guidelines on women's knowledge and practice among primiparous postnatal mothers. **Subjects and Methods:** An interventional quasi-experimental, pre-posttest, research design was carried out at the postpartum unit of Fayoum General and University Hospitals on 100 primiparous women. Data were collected using a structured interview questionnaire. **Results:** There is a highly significant improvement of the studied women's knowledge regarding puerperal sepsis after introducing of the puerperal sepsis self-care-nursing-guidelines compared with pre-intervention ( $p < 0.001$ ). There are no significant differences in the total score of knowledge about socio-demographic variables ( $p > 0.05$ ). However, improvement of women's knowledge regardless of their demographic variables was noticed in both immediately-intervention and one-month after the intervention. **Conclusion:** The primiparous-postnatal mothers who received and compliance with the guidelines regarding puerperal sepsis and its prevention had high knowledge and practices score in the post-test of the intervention program than in pre-test ( $P \leq 0.01$ ), which shows the effectiveness of puerperal sepsis self-care nursing guidelines in increasing the knowledge score of primiparous post-natal mothers regarding the prevention of puerperal sepsis. **Recommendations:** Such guideline needs to be given while the antenatal period also and thus promote healthy postpartum period. The study can be replicated in a larger sample, in different settings.

**Keywords:** *puerperal sepsis, self-care, nursing guidelines, knowledge and practices*

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## 1. Introduction

Puerperium is the phase that starts approximately one hour after the delivery of the placenta and covers the next six weeks. Puerperal sepsis is an infection that occurs during puerperium due to bacterial invasion of genital organs [1]. A recent study defined puerperal sepsis as a genital tract infection that occurs at any time from membrane rupture or the onset of labor until the 42<sup>nd</sup> day of postpartum. Signs and symptoms of puerperal sepsis include body temperature rise, pelvic pain, irregular vaginal discharge, and sub-involution [2]. Most of puerperal sepsis infection occurs upon discharge from the hospital. This is usually 24 hours after delivery, in the absence of postnatal follow-up. Most puerperal sepsis cases may go undiagnosed and unreported. The predisposing factors contributing to infections include home birth in unhygienic conditions, low socioeconomic status, poor nutrition, primiparity, anemia, prolonged

membrane rupture, prolonged labor, multiple vaginal examinations, obstetric procedures held in the uterus and postpartum hemorrhage. Puerperal infection may present as puerperal fever or sepsis, endometritis, wound infection, mastitis, urinary tract infection [3]. Also, it has been shown that pre-existing medical problems, febrile illness or taking antibiotics during 2 weeks before presentation, operative vaginal delivery and cesarean section may be associated with severe puerperal infections [4]. Despite improvements in patient care and global progress towards maternal mortality reduction, sepsis remains a leading cause of preventable maternal death. [3].

In 2013, over 30.000 maternal deaths (11.0%) were referred to postpartum sepsis and is considering as the third most frequent cause of approximately 290.000 maternal deaths worldwide [5,6]. Moreover, other studies reported that over 5 million/year of maternal sepsis occurs globally with an estimated 75.000 maternal death, and mortality rates attributable to sepsis approach 33.0% in low-income settings [7]. However, similar to what has been experienced in some developing countries, because

of poor infection control (IC) practices in labor and delivery units, with an increase in the use of health facilities; it could be expected that; the rates of puerperal sepsis will be on the rise [8]. Therefore, it would be wise to review the procedures, activities, and practices in labor and delivery units related to infection control and to identify factors that contribute to the development of puerperal infections. Such data could be used to prevent and protect pregnant women's health-associated infections [9].

For most women, pregnancy and childbirth are natural processes requiring little medical intervention [10,11]. Satisfaction is a significant indicator of the quality of treatment that is needed or perceived. It is essential to ensure that medical services are patient-centered and respond to the needs of women. Satisfaction also has repercussions for health service utilization, as women will seek to avoid clinicians or services which they perceive unsatisfactory. Finally, satisfaction with perinatal care can reinforce women's positive attitude towards their pregnancy and ultimately their baby [10,12,13].

Assessment of self-care includes the mother's knowledge of how to care herself and also whether she, actually, performs the care. Self-care includes showering, perineal care, fundus checking, breast care, rest, and sleep. Support the client's recovery by helping and encouraging her to properly bathe, toilet, and feed herself independently. Strict aseptic technique during labor and birth as well as frequent hand hygiene by those providing care to the mother are major factors in preventing postpartum infections [14]. Prevention is always better than cure, as we all understand. In order to prevent puerperal infections, nurses play a vital role. 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 patient 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 infection prevention [15].

Maternity nurses play a crucial role in the quality of antenatal/postnatal care improvement, which provides pregnant and puerperal woman education and support. At the same time, the nurse can provide health promotion & psychosocial services include assessment, health education, counseling & appropriate referral [16-23]. Regardless of the advanced scientific research in various fields of knowledge, puerperal infection is still a major public health problem, as evidenced by high morbidity and mortality prevalence [24]. The nurses, however, play an important role in designing multidisciplinary strategy and treatment plans to cover women in the postpartum, qualified care is given to prevent the increased puerperal infection rates. Thus, the postpartum period is a period of risk, which makes the essential skilled nursing care that is based on the prevention of complications [25]. 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 [26]. Thus educational actions become

transformed and build a potentiating strategy of nursing care in pregnancy and childbirth [24].

## 1.1. Aims of the Study

1. Assess the level of knowledge of puerperal sepsis and its preventive measures among primiparous postnatal mothers.
2. Evaluate the effectiveness of puerperal sepsis self-care nursing guidelines on women's knowledge and practice among primiparous postnatal mothers.
3. Find out the correlation between educational knowledge scores and follow-up visits knowledge scores of primiparous postnatal mothers on prevention of puerperal sepsis with the selected demographic variables.

## 1.2. Hypotheses

1. Puerperal sepsis self-care nursing guidelines will have a positive effect on primiparous postnatal women's knowledge and practices.
2. A positive correlation between primiparous postnatal mothers' knowledge scores of puerperal sepsis and the selected demographic variables will be found.

## 2. Subjects and Method:

### 2.1. Research Design

Quasi-experimental design, by using pre-test and post-test, was used; one group only adopted for the study.

### 2.2. Setting

The study was conducted in the postnatal ward at Fayoum General and University Hospitals.

### 2.3. Subjects

A purposive sampling, of 100 primiparous women at the post-natal ward, was used to select the study population who met the inclusion criteria. Data collection for the study took seven months along; from of January to July 2019.

#### 2.3.1. Inclusion Criteria

- Primiparous-postnatal mothers
- Can read and write.
- Who delivered normally or by cesarean section
- Willing to participate in the study
- Who are free from any infectious diseases.

#### 2.3.2. Exclusion Criteria

- Multiparous postnatal mothers.
- Mothers who are diagnosed with infectious diseases.

### 2.4. Tools of Data Collection

The researchers have updated a standardized interview questionnaires; designed to test the awareness and

behaviors of the mother about puerperal sepsis and its prevention. The questionnaire included four parts:

#### 2.4.1. Part 1

Included data related to socio-demographic characteristics (age, religion, residence, occupation, level of education) and source of women's information about puerperal sepsis.

#### 2.4.2. Part 2: Consisted Of 2 Sections

- a. *Section (a)*: Included data related to obstetrics history (follow up during last pregnancy, number of antenatal care follow-up visits, pregnancy outcomes, and complications).
- b. *Section (b)*: contains current delivery information (method, length, and place of delivery, number of vaginal exams, complications of labor).

#### 2.4.3. Part 3

It consists of 5 items contains questions related to mother's knowledge regarding puerperal sepsis and its prevention with multiple forms of qualitative and quantitative data, some questions responded by yes or no, with score one or zero, other questions were open-end questions. The total score was classified into a very good knowledge score (81% to 100%), good knowledge score (61% to 80%), average knowledge score (41% to 60%) and poor knowledge (< 40%).

#### 2.4.4. Part 4

It consisted of 26 items contains statements related to the mother's compliance regarding puerperal sepsis and its prevention guidelines. The responses will be based on a three-point Likert scale (never scored "1", sometimes scored "2" and always scored "3").

### 2.5. Validity and Reliability

Content validity of the questionnaire was ensured through three experts in the field of obstetrics and gynecological nursing, obstetrics and gynecological medicine. Modification to the tools was made according to experts' judgment on the clarity of sentences, appropriateness of the content, the sequence of items, and accuracy of scoring and recording of items. The tool's accuracy was based on Cronbach ALPHA. The Cronbach's alpha for the reliability was 0.86.

### 2.6. Pilot Study

Applicability of the research tools was checked through a pilot study conducted on 10% of women (excluded from the study sample) to ensure the tool's consistency and comprehensibility.

### 2.7. Administrative & Ethical Considerations

Before conducting the study, official permission was obtained from the director of Fayoum General and University Hospitals. Consent was obtained from each mother recruited in the study. Study participant woman was told that all their data were highly confidential. Anonymity was also maintained by assigning a code number to each person instead of names to protect their

privacy. Only the authors and the participants had data available.

### 2.8. Procedure

The research was formulated in three phases: assessment, implementation, and evaluation.

1. **Assessment phase**: during this phase, the researchers visited the post-natal ward to evaluate the place and saw the rate of postnatal women. Personal communication was done with nurses to explain the purpose of the study to them. After that; the women who fulfilled study criteria were met; the researchers explained the purpose of the study and obtained their consent, all primiparous women in the post-natal ward were interviewed to collect their socio-demographic data; the interview for each mother was 15 minutes. Then, the researchers collect the data related to mother medical and obstetric history and the last pregnancy history that may affect the outcomes of post-natal period, and information concerning present labor such as the mode of delivery, the place of labor, what about amniotic fluid before starting labor process, and any complication occur during labor.
2. **Implementation phase**: During the implementation phase, the guidelines were given to the postnatal mother and explained through pictures and booklets. The researchers explained the booklet's content, answered the mother's questions, and took the telephone number to follow them up. The researchers made discussion, demonstration based on the level of understanding. The researchers covered and discussed the following topics: definition, causes, the number of mothers prone to puerperal sepsis, signs, and symptoms, how to protect against puerperal sepsis, the precautions during the post-natal period, and then the mistakes must not be done at post-natal period.
3. **Evaluation phase**: the post-test-evaluation of the guidelines was done using the same pre-test tool. Comparison between the collected data before, immediately after intervention and after one month of guidelines intervention was done to determine the effectiveness of guidelines.

### 2.9. Statistical Analysis

Data entry and statistical analysis were done using the SPSS computer Soft-ware program, version 23.0. The data were tested for normality using the Anderson-Darling test and for homogeneity variances before further statistical analysis. The following statistical measures were used:

- A. Descriptive measures included:
  1. Categorical variables were described by number and percent (N, %).
  2. Continuous variables described by mean and standard deviation (Mean  $\pm$  SD)
- B. Statistical tests included:
  1. Chi-square ( $\chi^2$ ) test
  2. One way ANOVA T-test
  3. Independent t-test
  4. Pearson (r) correlation test

5. The graphical presentation included Column diagram.  
C. Statistical significance was considered at  $P < 0.05$ .

### 3. Results

**Table 1:** indicates the frequency distribution of socio-demographic characteristics of participant women. The table illustrates that more than half (58.0%) of the studied women aged between twenty to thirty years. Regards to residence; two-third (70.0%) of study women were from urban. As regards women's level of education; around quarter (24.0%) of them had a university education, and more than one third (34.0%) of study women had secondary school education. Concerning the job; the majority (82.0 %) of participants were housewives.

**Table 2:** shows the frequency of follow-up (antenatal visit during pregnancy) and if there were problems during pregnancy, the table shows that; 98.0% of women had followed up their pregnancy. Most (68.0%) of women had their follow-up in a private clinic and the majority (80.0%) of them had no medical or obstetric problems during pregnancy.

**Table 3:** presents the current labor/delivery characteristics of women in the study sample. The table shows that more than half of the sample (60.0%) were delivered normally, the majority (98.0%) of them delivered in hospital and more than half (68%) of study sample their delivery began spontaneously, and the membrane was ruptured in 52.0% of the sample. In relation to labor complications; the majority (88.0%) of the sample hadn't labor complications and 12.0% of them reported that they exposed to complications; these complications were an early rupture of membrane (6.0%) and obstructed labor (4.0%), and only (2.0%) had prolonged labor. The same table shows that the period from the beginning of labor pain to the birth of the baby was with mean  $8.894 \pm 8.265$  and times of vaginal examination were with mean  $3.250 \pm 2.0976$ .

**Figure 1:** Clear up that more than half (58.0%) of studied women had their information from the health personnel.

**Table 4:** illustrates that there is a highly significant improvement of the studied women's knowledge regarding most of the studied items concerning puerperal sepsis after introducing the puerperal sepsis self-care nursing guidelines compared with before intervention,  $p < 0.001$ .

**Figure 2:** illustrates that there is a satisfactory improvement regarding women's total knowledge of pre-intervention compared to the immediate-post intervention and one-month after the intervention.

**Table 5:** Clear up that nearly more than half (59.0%) of the study sample were always commitment with the guidelines and less than quarter (19.0%) of the sample were sometimes commitment with the guidelines, to some extent and never commitments were 11.0%.

**Figure 3:** Illustrates the commitment of women with the puerperal sepsis self-care nursing guideline more than two-third (78.0%) of the sample were committed with the guidelines.

**Table 6:** The table revealed that there was a highly statistically significant difference between

pre/post-intervention of knowledge's score (Range, Median, Mean  $\pm$  SD), ( $P$ -value = 0.001).

**Table 7:** Clear up that there was a good degree of knowledge of the primiparous postnatal mothers regarding prevention of puerperal sepsis after immediately-intervention (48.0%) and one month after the intervention (42.00). Statistically significant difference is observed ( $p = 0.000$ ).

**Table 8:** shows that there are no significant differences in the total score of puerperal sepsis knowledge in relation to Socio-demographic variables ( $p > 0.05$ ). However, improvement of women's knowledge regardless of their demographic variables was noticed in both immediately-intervention and one-month after the intervention.

**Table 9:** illustrates negative associations between women's age and residences and their total knowledge score (immediately-intervention and one-month after the intervention). Moreover, positive associations between women's educational level and antenatal Follow-up visits and their total knowledge score (immediately-intervention and one-month after the intervention). Regarding occupation, the table declares a negative correlation between women's occupation and their total knowledge score only immediately-intervention and a positive correlation one-month after the intervention. Meanwhile, the same table shows that those associations are not statistically significant ( $p > 0.05$ ).

**Table 1. Frequency distribution of socio-demographic characteristics for participant women (No=100)**

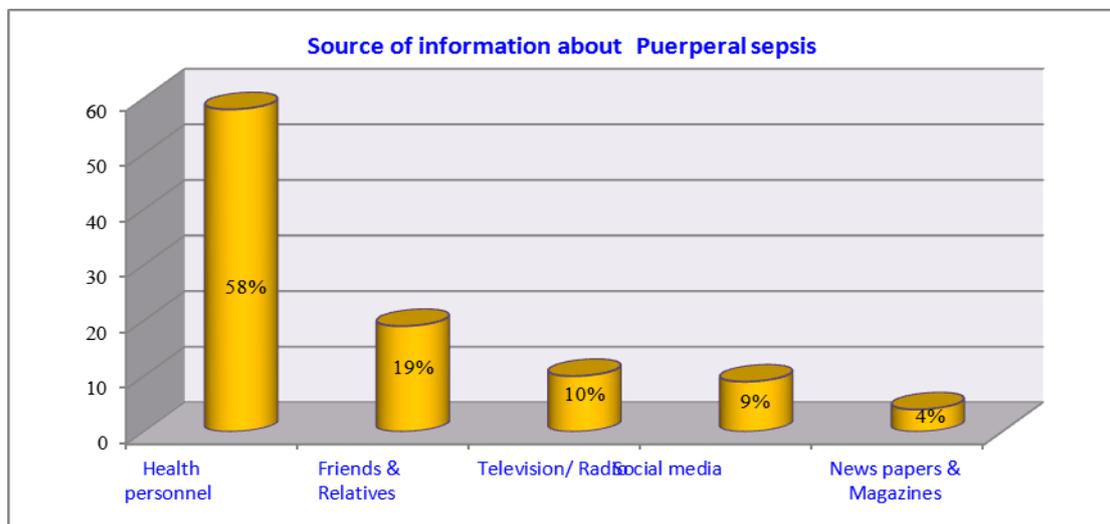
Variables	No.	%	
Age by years	< 20 years	18	18.0
	20-30 years	58	58.0
	> 30 years	24	24.0
Residence	Rural	30	30.0
	Urban	70	70.0
Level of education	Read and write	18	18.0
	Primary school	8	8.0
	Preparatory school	16	16.0
	Secondary school	34	34.0
	university	24	24.0
Occupation	Housewife	82	82.0
	Employer	18	18.0

**Table 2. Frequency distribution of follow-up (antenatal visit during pregnancy) for participant women and if there are problems during pregnancy (No=100)**

Items	Frequency	Percent	
Did you follow-up on your pregnancy?	Yes	98	98.0
	No	2	2.0
Number of follow-up visits	Minimum	2	
	Maximum	20	
	Mean $\pm$ SD	7.51 $\pm$ 3.992	
Place of follow-up	Health unit	22	22.0
	Private clinic	68	68.0
	Hospital	8	8.0
Were there medical or obstetrics problems during pregnancy?	Yes	20	20.0
	No	80	80.0
If yes	Gestational diabetes	2	2.0
	Vaginal bleeding	4	4.0
	Anemia during pregnancy	14	14.0

**Table 3. Current labor/delivery characteristics of women in the study sample (No 100)**

Items		Frequency	Percent
Mode of delivery	Normal delivery	60	60.0
	Cesarean section	16	16.0
	Episiotomy	24	24.0
Place of birth	Home	2	2.0
	Hospital	98	98.0
Type of labor	Spontaneous	68	68.0
	Induced	16	16.0
Condition of the membrane on hospital admission	Ruptured	52	52.0
	Intact	46	46.0
labor complications	Yes	12	12.0
	No	88	88.0
Types of complications	Early rupture of membrane	6	6.0
	Obstructed labor	4	4.0
	Prolonged labor	2	2.0
	<b>Minimum</b>	<b>Maximum</b>	<b>Mean ± SD</b>
The Period from the beginning of labor pain to the birth of the baby?	1.0	48.0	8.894 ± 8.265
Times of vaginal examination	0.0	8.0	3.25 ± 2.0976



**Figure 1.** Source of women's information about puerperal sepsis (No = 100)

**Table 4. Comparison of women's knowledge before, immediately post intervention and after one month of intervention related to puerperal sepsis (No = 100)**

Variables		Follow up						p. value
		pre		post		After one-month		
		N	%	N	%	N	%	
Definition of puerperal sepsis	No	70	70.0	0	0	0	0	0.001**
	Yes	30	30.0	100	100	100	100	
Causes of puerperal sepsis	Unknown	18	18.0	2	2.0	2	2.0	0.001**
	Incomplete correct	82	72.0	40	40.0	42	42.0	
	correct	0	0.0	58	58.0	56	56.0	
Who are the high-risk women to have puerperal sepsis?	Unknown	28	28.0	0	0.0	0	0.0	0.001**
	Incomplete correct	72	72.0	34	34.0	34	34.0	
	correct	0	0.0	66	66.0	66	66.0	
Signs & symptoms of puerperal sepsis	Unknown	18	18.0	4	4.0	4	4.0	0.001**
	Incomplete correct	82	82.0	54	54.0	54	54.0	
	correct	0	0	42	42.0	42	42.0	
Protective measures of puerperal sepsis	Yes	22	22.0	98	98.0	98	98.0	0.001**
	No	78	78.0	2	2.0	2	2.0	

Chi-Square Tests, \*\*= highly significance, p<0.01.

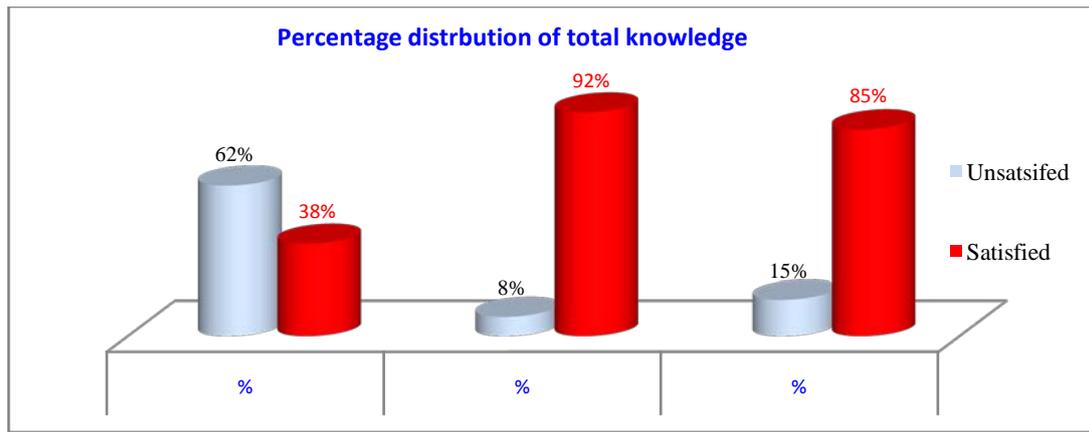


Figure 2. Comparison of knowledge scores before, immediately-post and after one-month of intervention related to puerperal sepsis among studied women (No = 100)

Table 5. Commitment level for puerperal sepsis self-care nursing guidelines among studied women (No = 100)

Items	Never		Sometimes		Always		To some extent	
	n	%	n	%	n	%	n	%
Continuous monitoring of vital signs after delivery	16	16.0	40	40.0	40	40.0	4	4.0
Measure temperature daily	12	12.0	30	30.0	44	44.0	14	14.0
Maintain breastfeeding of the baby immediately after birth	10	10.0	8	8.0	78	68.0	4	4.0
The underwear be sterilized properly	6	6.0	20	20.0	68	68.0	6	6.0
Change the underwear regularly	2	2.0	12	12.0	84	84.0	2	2.0
The need to wash hands before and after perineal care	6	6.0	10	10.0	84	84.0	---	---
Clean genital and perineal area several times daily with an antiseptic solution in right direction before changing dressing	4	4.0	14	14.0	82	82.0	---	---
Drying the perineum well with a clean and dry towel	4	4.0	16	16.0	78	78.0	2	2.0
Observe the perineum in case of episiotomy for having any symptoms of the presence of infection such as bloody secretions, bad odor or color or delay of wound healing and should go to the doctor immediately.	8	8.0	12	12.0	70	70.0	10	10.0
Follow up involution process in 15 days	8	8.0	20	20.0	56	56.0	16	16.0
Follow up color, odor and amount of lochia	8	8.0	16	16.0	62	62.0	14	14.0
Do not sit in the water for long periods when bathing	18	18.0	22	22.0	46	46.0	14	14.0
Attention to proper nutrition	6	6.0	24	24.0	60	60.0	10	10.0
Attention to exercise and simple sports such as daily activities	10	10.0	30	30.0	56	56.0	4	4.0
Drink warm drinks and constantly	12	12.0	20	20.0	58	58.0	10	10.0
Take enough rest and sleep	14	14.0	16	16.0	64	64.0	6	6.6
Avoid using vaginal dosh	6	6.0	22	22.0	52	52.0	20	20.0
Avoiding practice sexual activities during the first 40 days	14	14.0	14	14.0	50	50.0	22	22.0
Avoid any source of infection	14	14.0	24	24.0	36	36.0	26	26.0
Take care to limit visitors	24	24.0	10	10.0	38	38.0	28	28.0
Ensure that visitors are free from respiratory tract infection and any infectious disease	24	24.0	16	16.0	42	42.0	18	18.0
Total	11	11.0	19	19.0	59	59.0	11	11.0

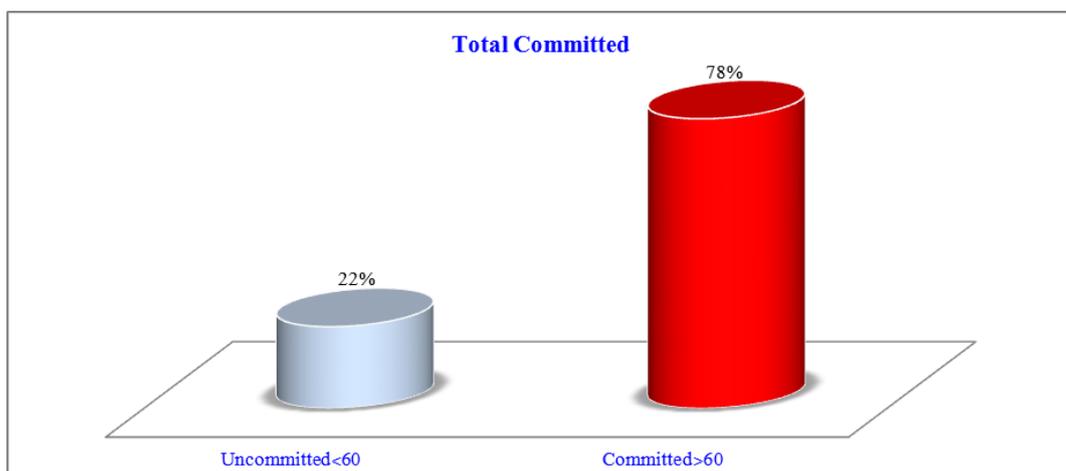


Figure 3. Commitment with the puerperal sepsis self-care nursing guidelines among studied women (No = 100)

**Table 6. Range, Mean, Median and Standard Deviation of pre-test and post-test knowledge score of primiparous postnatal mothers regarding prevention of puerperal sepsis before, after-immediately intervention and after intervention by one month (No = 100)**

	Pre-test	Post-test	After one month	Total	p. value
<b>Range</b>	3.00	5.00	5.00	5.00	0.001
<b>Median</b>	6.0000	8.0000	8.000	7.090	
<b>Mean ± SD</b>	5.9700 ± 0.90403	7.5600 ± 1.2973	7.5100 ± 1.28311	6.9167 ± 1.56136	

Maximum score = 10.

**Table 7. Frequency and percentage distribution of degree the primiparous postnatal mothers' knowledge regarding prevention of puerperal sepsis before, after immediately-intervention and one-month after the intervention (No = 100)**

Grading	Percent.	Pre-test		Post-test		After one month		p. value
		Freq.	Percent.	Freq.	Percent.	Freq.	Percent	
Very good	81-100	0	0.0	29	29.0	30	30.0	0.000
Good	61-80	27	27.0	48	48.0	42	42.00	
Average	41-60	49	49.0	23	23.0	28	28.00	
Poor	<40	24	24.0	0	0.0	0	0.0	

Maximum score = 10.

**Table 8. Relationship between women's total knowledge score regarding puerperal sepsis in relation to selected demographic variables.**

Demographic data	t-test	Mean ± (SD)			p.1	p.2	p.3
		Pre	Post	After one-month			
<b>Level of education</b>							
Read and Write	18	5.38 ± 1.33	7.50 ± 1.20	7.44 ± 1.09	0.106	0.607	0.425
Primary Education	8	5.62 ± 1.76	7.50 ± 1.51	7.37 ± 1.30			
Preparatory Education	16	5.12 ± 1.02	7.12 ± 1.36	7.00 ± 1.50			
Secondary Education	34	6.11 ± 1.34	7.76 ± 1.34	7.73 ± 1.30			
Highly Educated Women	24	5.66 ± 1.12	7.62 ± 1.20	7.62 ± 1.20			
<b>Total</b>	<b>100</b>	<b>5.68 ± 1.30</b>	<b>7.56 ± 1.29</b>	<b>7.51 ± 1.28</b>			
<b>Residence</b>							
Rural	30	5.73 ± 1.04	7.80 ± 1.15	7.70 ± 1.23	0.791	0.228	0.335
Urban	70	5.65 ± 1.44	7.45 ± 1.34	7.42 ± 1.30			
<b>Occupation</b>							
House Wife	82	5.67 ± 1.29	7.56 ± 1.33	7.50 ± 1.13	0.881	0.987	0.869
Employee	18	5.72 ± 1.40	7.55 ± 1.14	7.55 ± 1.14			

P1 = pre-test  
P2 = immediate post-test  
P3 = after one-month post-test

ANOVA t-test and independent t-test.

**Table 9. Correlation matrix for the total knowledge score in relation to selected demographic variables**

Variables	Total knowledge					
	Pre-test		Immediate-post		After one-month	
	r	p. value	r	p. value	r	p. value
Age	0.082	0.416	- 0.016	0.872	- 0.037	0.714
Residence	- 0.027	0.791	- 0.122	0.228	- 0.097	0.335
Level of education	0.138	0.171	0.070	0.486	0.093	0.357
Occupation	0.015	0.881	- 0.002	0.987	0.017	0.869
Antenatal Follow-up visits	0.075	0.461	0.062	0.540	0.057	0.573

Pearson Correlation test (r).

### 4. Discussion

Childbirth is a joyful experience for many women but, unfortunately, it can be a difficult period bringing with it new problems that are laid down during pregnancy and childbirth. The childbirth-related sufferings make an important part of the ill-health and death of the world. Puerperal sepsis is an important public health problem which is a leading cause of maternal death, especially, in developing countries, due to the lack of knowledge on

preventive methods [27]. Motherhood is one of the major transitions in adult life for women. Motherhood is a privilege reserved exclusively for women [27,28,29]. It is a revolutionary act, an evolutionary step in the way a woman becomes a winged angel. Motherhood is a period that includes becoming a mother and rearing of a child. Becoming a mother changes her heart, her thoughts, and her actions and labeled as a transition and life crisis. Puerperium is the time after birth when the mother responds to the pregnancy process both physically and

psychologically. For both mother and baby, Puerperium is a time of great importance. It is an aspect of maternity care that has received relatively less attention compared with pregnancy and delivery. Many troubling complications arise shortly after childbirth. Puerperal pyrexia and sepsis are among the leading causes of preventable maternal mortality and morbidity in both developing and developed countries. Puerperal infection (also referred to as childbed fever) is a disease that develops shortly after birth [28].

In the current study more than half of the women were in mid-age (aged between 20-30 years), two-third of study women were from urban, than one-third of study women had secondary school education and 18.0% of them can read and write. The majority of the participants were housewives with regard to occupational status. The foregoing present study finding is in the partial agreement with Lalitha (2016), who assessed the knowledge and practice of postnatal mothers on prevention of various puerperal infections in a chosen maternity hospital and demonstrated that the majority of the participating mothers were in 20-25 years of age group, with primary/secondary education and most of them were housewives, and from urban residential [30]. Moreover, these findings in contrast with Belagavi, et al. (2015), who studied the knowledge regarding puerperal sepsis and its prevention among postnatal mothers in selected hospitals of Bhavnagar and reported that the majority of post-natal mothers were living in a rural area, however, they had primary education and [31]. But Study from Bangladesh contrasts with this study, as it was shown that no significant association between puerperal sepsis and place of living [32].

The finding of the present study revealed that nearly all of the participated women (98.0%) had follow-up their pregnancy with a mean  $7.51 \pm 3.992$  number of antenatal follow-up visits, most of them had their follow-up in private clinic and majority of them had no medical or obstetric problems during pregnancy. Our results are in agreement with the study of Lalitha (2016) who revealed that more than half of his studied women had no medical and obstetric complications during pregnancy. Regarding follow-up of pregnancy, the results reported that most (86.0%) of women follow-up their pregnancy, around half (44.0%) of them were had one to five follow-up antenatal visits and 56.0% follow-up their pregnancy at obstetrics clinic [30]. Demisse et al. (2019) revealed an important correlation between the number of ANC follow-ups and puerperal sepsis. Those mothers who had antenatal care (ANC) follow-up 1 to 2 times be 4.2 times more likely to develop puerperal sepsis compared to those who had 3 to 4 times. This is supported by a study from Pakistan [33].

The finding of the present study revealed that more than half (60.0%) of the samples were delivered normally, the majority of them delivered in hospital and more than half of the study sample their delivery began spontaneously and the membrane was ruptured and the majority of the sample hadn't labor complications. These findings are consistent with Masoud et al (2016) [34] who study the effectiveness of puerperal sepsis self-care guidelines on women's health during puerperium and reported that most of the studied women had no labor complications. The present study clears up that more than half of the studied women had their information about puerperal sepsis from

the health personnel followed by friends and relatives. This may be due to the anxiety of primiparous-postnatal mothers on their first baby. On the other hand, Mathew (2013) assigned that most of the subjects (40%) received information from friends and relatives. Among the rest, 32.0% received information from newspapers and magazines, 8.0% received information from radio and TV, and 20.0% received information from health personnel [35].

The finding of the present study illustrates that there is a highly significant improvement of the studied women's knowledge regarding most of the studied items about puerperal sepsis after introducing of the puerperal sepsis self-care nursing guidelines compared with before intervention. Moreover, this finding is consistent with Singh et al (2011) who found that the pretest mean of knowledge score regarding puerperal sepsis was 21.97, which increase to 33.87 in posttest with statistically significant differences among the experimental group who received teaching program. Hence, it was interpreted that the structured teaching program was effective [36]. The foregoing present study finding clears up that nearly more than half of the study sample was always commitment with the guidelines, and less than a quarter of the sample was sometimes commitment with the guidelines. The present study finding consistent with Masoud et al (2016) who reported that nearly half to two-thirds of the study sample were always commitment with guidelines and around a quarter of the sample was a commitment to some extent and never commitments ranged only from 2.0% to 12.0% [34].

The finding of the present study revealed that there was a highly significant score of women's knowledge after guidelines implementation compared with before intervention. In partial agreement with this, the findings Belagavi et al (2015) revealed that the majority (65%) of mothers in pre-test of experimental group were having average knowledge score (8-14), wherein post-test, most (63.33%) of the mothers had average knowledge score (8-14) and 36.66% of mothers were having good knowledge score (15-22) which indicates that the structured teaching program (STP) was effective [31]. Mathew (2013) showed that the mean post-test knowledge score (29.5) of primiparous postnatal mothers was higher than the mean pre-test knowledge score (15.76). This indicates that the structured teaching program is effective in increasing the knowledge score of primiparous postnatal mothers regarding the prevention of puerperal infections. This study shows that there is a great need to develop and implement a structured teaching program on the prevention of puerperal infections. Therefore it was concluded that the structured teaching program was highly effective in improving the knowledge on prevention of puerperal infections among primiparous postnatal mothers [35].

Around all (100.0%) of the studied primiparous postnatal mothers were had a poor degree of knowledge regarding causes of puerperal sepsis; as 18.0% of them said they didn't know, and 82.0% mentioned incomplete causes. Nevertheless, the result of this study showed that after self-care guidelines were enforced, there was a good degree of awareness of the primiparous postnatal mothers about all the studied items and preventive measures of

puerperal sepsis. This finding is in partial agreement with Yahaya (2013) who mentioned that a total of 53% of respondents were not aware of the causes of puerperal sepsis, 10% thought to be caused by evil spirits. There is little information about the causes of puerperal sepsis [37].

Our study showed that there is no significant difference in the total score of puerperal sepsis knowledge with selected demographic variables. A study conducted by Indra (2015) revealed that there is no correlation between the knowledge and practice and, unfortunately, there is no association between the knowledge scores with selected demographic variables [38]. The infection control measures require proper education, improvements of guidelines and various technologies and the introduction of new clinical guidelines [39]. There is, therefore, a clear need to introduce well-developed infection control systems in all health facilities in our country.

The primiparous-postnatal mothers who received and compliance with the guideline regarding puerperal sepsis and its prevention had high knowledge and practices score in the post-test of the intervention program than in pre-test ( $P \leq 0.01$ ), which shows the effectiveness of puerperal sepsis self-care nursing guidelines in increasing the knowledge score of primiparous post-natal mothers regarding the prevention of puerperal sepsis. The overall pre-test awareness of puerperal sepsis prevention was low and a structured teaching program on puerperal infection prevention was required. Pre-test knowledge scores show that 24.00% of the subjects had poor and 49.00% had average knowledge score, and post-test scores show that 30% secured a very good knowledge score, 42% attained a good knowledge score.

The results of the current study declare the women's total knowledge of puerperal sepsis and its preventive measures; the pre-test of the present study revealed that most of the women had unsatisfactory knowledge about. This lack of knowledge may be attributed to that all of them were primiparous. After the implementation of the guidelines, the results indicated that there is a significant increase in women's knowledge. Moreover, the progression of very-good and good women's grading and regression of poor women's grading, after the implementation of the guidelines compared to before, were observed associated with statistical differences. This improvement/progression was also maintained up to the follow-up test (one-month later) through the observed results. This improvement could be attributed to that most women (78.0%) of the sample were committed with the guidelines. Additionally, the attending of the guidelines sessions and the lecture and positive reinforcement or the long-term retention of knowledge, as well as wide verities of used educational used methods [40,41,42]. The distributed Arabic booklets, also, played a crucial role in attaining and retain knowledge about puerperal sepsis. Booklets are best used when they are brief, written in plain language, full of good pictures and when they are used to back-up other forms of education. This is, in accordance, with Edgar Dale's or the NTL's Pyramid of Learning as cited by Masters as the pyramid illustrated that individuals can retain 10.0% of what he read and 20.0% of what he sees and hear (audiovisual). The same author added that ones can retain 50.0% of what he learned by a discussion [43-46].

## 5. Conclusion

The findings of this study are reflecting that; primiparous postnatal women's total knowledge and practice regarding puerperal sepsis were significantly improved after the implementation of the self-care guidelines. Improvement of women's total knowledge regardless of their demographic variables was noticed in both immediately-intervention and preserved until one month later. However, this improvement is not statistically significant. The research hypotheses are accepted.

## 6. Recommendations

The following recommendations were proposed on the basis of the findings of this study:

1. Such guidelines need to be given while the antenatal period; also and thus promotes a healthy post-partum period.
2. The study can be replicated on a larger sample in different settings.
3. A similar study can be conducted to develop health education guidelines or pamphlets on other postnatal complications.
4. Continuing education of the nurses who work in obstetrics and gynecological areas must be updated with the necessary knowledge about the recent trends.
5. Health team members in antenatal, labor and postnatal care could conduct a well-established continuing education in the hospitals on the importance of maintaining an aseptic technique.

## References

- [1] Dutta D., (2004). Text Book of Obstetrics Including Perinatology & Contraception, 6<sup>th</sup> ed., Central book publisher, Calcutta 102-103.
- [2] Bamfo JEAK. (2013). Managing the risks of sepsis in pregnancy. *Best Pract Res Clin Obstet Gynaecol.*; 27(4): 583-95.
- [3] Maharaj D., (2007). Puerperal pyrexia: a review. Part I. *Obstet Gynecol Surv.*; 62(6): 393-399.
- [4] Acosta CD., and et. al., (2014). Severe maternal sepsis in the UK, a national case control study. *PLoS Med.* 2014; 11(7).
- [5] WHO. Trends in Maternal Mortality: 1990 To 2013. Estimates by WHO, UNICEF, UNFPA, the World Bank and the United Nations Population Division. Geneva: World Health Organization; 2014.
- [6] Kassebaum Nj, et al., (2014). Global, Regional, and National Levels and Causes of Maternal Mortality during 1990-2013: A Systematic Analysis for the Global Burden Of Disease Study 2013. *Lancet.* 2014.
- [7] Arulkumaran N. & Singer M., (2013). Puerperal sepsis. *Best Pract Res Clin Obstet Gynaecol.* 2013 Dec; 27(6):893-902.
- [8] Hussein J, et. al., (2011). A review of health system infection control measures in developing countries: what can be learned to reduce maternal mortality. *Global Health.* 2011; 7:14.
- [9] Tabatabaei S., Behmanesh Pour F. and Azadeh H., (2016). Infection Control Practices and Program Management in Labor and Delivery Units: A Cross-Sectional Study From Iran, *Int J Infect.* 2016 April; 3(2).
- [10] Wildman K., et al., (2003). European indicators of health care during pregnancy, delivery and the postpartum period, Elsevier, *European Journal of Obstetrics & Gynecology and Reproductive Biology* 111 (2003) S53-S65 S59.
- [11] Farg D. and Hassan H. (2020). Obstetric Outcomes for Teenage and Adult Pregnancy: A Comparative Study; 7(1): of Nursing & Care Open Access Journal: 1-16.

- [12] Nady F., El-Sherbiny M., Youness E., Hassan H. (2018). Effectiveness of Quality of Life Planned Teaching Program on Women Undergoing Gynecologic Cancer Treatment. *American Research Journal of Oncology*; 1(1): 1-17.
- [13] Nasr E, Hassan H. (2016). Association between quality of family planning services and client's satisfaction level in maternal and child health centers in Port Said city. *Journal of Nursing Education and Practice*; 6(1): 85-99.
- [14] White L., Duncan G., Bauble W., (2011). *Foundations of Maternal & Pediatric Nursing*, 3<sup>rd</sup> ed., Cengage Learning, United States of America, Pp. 107-130.
- [15] Jayanthi G., (2009). A Study To Assess The Knowledge And Attitude On Prevention Of Puerperal Infection Among Staff Nurses At Selected Hospital Bangalore.
- [16] Hassan, H., Zahran, K., Youness, E., & Nady, F. (2015). Pregnant Women's Awareness, Intention and Compliance regarding Folic Acid Usage for Prevention of Neural Tube Defects According to Health Belief Model in Beni-Suef City. *Pyrex Journal of Nursing and Midwifery*, 1(3), 13-26.
- [17] Hassan, H., Nady, F., Youns, E., & Zahran, K. (2016). Call for Change Level of Knowledge, Awareness and Attitude to Follow A High Folate Diet Among Pregnant Women. *IOSR Journal of Nursing and Health Science*, 5(1), 93-100.
- [18] Said, A. (2016). Effect of counseling intervention on women's knowledge, practices and lifestyle of fetal well-being among Primigravida. *International Journal of Nursing Science*, 6(4), 87-93
- [19] Farg, D., & Hassan, H. (2019). Study Hyperemesis Gravidarum Requiring Hospital Admission during Pregnancy: Effect of Nursing Implication on Its Progress. *American Journal of Nursing Research*, 7(3), 328-341.
- [20] Hassan, H., Said, S., & Hassanine, Sh. (2017). Disparities of Prevalence and Causes of Maternal Antenatal Anxiety among Primigravida Pregnant Women in Egypt. *American Research Journal of Nursing*, 3(1), 1-15.
- [21] Mostafa H., Yousef F., Hassan H. (2018). Health Related Quality of Life Educational Interventions: Effect on Chronic Hepatitis C Patients'. *Saudi Journal of Nursing and Health Care*; 1(2): 56-67.
- [22] Said S., Hassan H., Sarhan A. Effect of an Educational Intervention on Women's Knowledge and Attitude Regarding Cervical Cancer. *American Journal of Nursing Research*. 2018; 6(2): 59-66.
- [23] Atwa A., Hassan H., Ahmed S. (2019). The impact of a hospital-based awareness program on the knowledge of patients about breast cancer and cancer cervix. *International Journal of Studies in Nursing*; 4(1): 20-29.
- [24] Duarte M., et al., (2014). Nursing Practice on Puerperal Infection Control: Integrative Review. *J Nurs UFPE on line*, Recife, 8(2):433-41, Feb., 2014.
- [25] Almeida MS., Silva IA., (2013). Women's needs in immediate puerperium in a public maternity in salvador, Bahia, Brazil. *Rev. Esc. Enferm USP*. 2013; 42(2): 347-54.
- [26] Busanello J., & et al., (2013). Woman's participation in the decision process of the pregnancy and puerperal cycle: nursing care integrative review. 2013; 32(4): 807-14
- [27] Hassan H. (2016). Infertility profile, psychological ramifications and reproductive tract infection among infertile women, in northern Upper Egypt. *Journal of Nursing Education and Practice*; 6(4): 92-108.
- [28] Fraser D., & Cooper M., (2003). *Myles: Textbook for Midwives*, 14th ed., Churchill Livingstone, London: 643-49.
- [29] Gamel W., Hassan H., El-ezazy A. Male Infertility and Psychological Repercussions: A Neglected Problem in Northern Upper Egypt. *International Journal of Studies in Nursing*, 2019; 4(4): 1-26.
- [30] Lalitha H., (2016). A study to assess the knowledge and practice of postnatal mothers on prevention of selected puerperal infections in a selected maternity hospital .*medical science journal*. 2016; 2 (2) 01-03
- [31] Belagavi P., Hetal S., Payal B., et al. (2015). Knowledge regarding puerperal sepsis and its prevention among postnatal mothers in selected hospitals of Bhavnagar. *Journal of International Academic Research For Multidisciplinary*; 3(4), 29-34.
- [32] Taskin T, & et al., (2016). Socio-demographic factors and puerperal Sepsis: experiences from two tertiary level hospitals in Bangladesh. *Int J Community Fam Med*. 2016; 1(113): 1-4.
- [33] Demisse G., & et al, (2019). Determinants of puerperal sepsis among postpartum women at public hospitals in west SHOA zone Oromia regional STATE, Ethiopia (institution BASEDCASE control study), *BMC Pregnancy and Childbirth* volume 19, Article number: 95 (2019), available at: <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-019-2230-x>.
- [34] Masoud et al (2016). Effectiveness of puerperal sepsis self-care guideline on women health during puerperium.
- [35] Mathew R., (2013). A Study to Assess The Effectiveness of Structured Teaching Programme on Prevention of Puerperal Infections among Primi Postnatal Mothers in Selected Hospitals at Mangalore, Rajiv Gandhi University of Health Sciences, Karnataka, available at: <http://52.172.27.147:8080/jspui/handle/123456789/9052>.
- [36] Singh, A., Agarwal, V. K., Chaudhary, V., Singh, A. & Sharma, M. (2011). Perception of RTIS/STDs among women of reproductive Age Group in a district of Utter Padesh, *National Journal of Integrated Research in Medicine*; 2(1), 25-28.
- [37] Yahaya SJ1, Bukar M. (2013). Knowledge of symptoms and signs of puerperal sepsis in a community in north-eastern Nigeria: a cross-sectional study. *J Obstet Gynaecol.*; 33(2):152-4
- [38] Indra V., (2015). A Study to Assess the Knowledge and Practice on Prevention of Puerperal Sepsis among Postnatal Mothers in Selected Hospital, Puducherry with a View to Develop an Information Booklet. *Int. J. Nur. Edu. and Research* 3(4). Oct.-Dec., 2015; Page 410-418.
- [39] Larson E., Quiros D. & Lin S., (2007). Dissemination of CDC, S Hand Hygiene Guideline and impact on infection rates. *Am J Infect Control*. 2007; 35(10): 666-675.
- [40] Hassan H. (2018). Effectiveness of a structured teaching program on anxiety and perception regarding toxoplasmosis among seropositive pregnant women in Northern Upper Egypt. *Clinical Nursing Studies*; 6(1): 1-19.
- [41] Hassanine Sh., Hassan H., Alkotb Z. (2017). Effect of Preventive Program on Progression of Osteoporosis among Female Patients over 40 years at El-Fayoum City. *American Research Journal of Nursing*; 3(1): 1-15.
- [42] Hassan H. (2019). Integrative Nursing Science in Women's Pre-conceptual Wellness. *International Journal of Health and Biological Sciences*; 2(1): 17-18.
- [43] Masters K. (2013). Edgar Dale's Pyramid of Learning in medical education: A literature review, *Medical Teacher*; 35(11): e1584-e1593.
- [44] Hassan H., Mohamady Sh., & Abd El-Gawad N. (2017). Protocol for improving nursing performance towards placental examination at labor units. *Clinical Nursing Studies*; 5(2): 1-11.
- [45] Hassan H, Nasr E. (2017). Improving nurses' knowledge and skills regarding tocolytics for inhibiting preterm labor. *Clinical Nursing Studies*; 5(1): 1-12.
- [46] Nady F., Said M., Youness E., Hassan H. (2017). Impact of Tailored Educational Program of Quality of Life Improvement on Women Undergoing Breast Cancer Treatment at El-Minia Region, Egypt. *American Research Journal of Gynaecology*; 1(1): 1-17.

