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**Self-Protective Behaviors among Pregnant Women regarding Spontaneous Abortion**

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**Abstract**

**Background:** Spontaneous abortion is considered a main reproductive health issue acts as a risk factor for pregnant women's welfare and a prominent component of maternal mortality statistics. Knowledge and self-protective behaviors among pregnant women regarding spontaneous abortion are very important. **The aim of this study:** was to identify knowledge and self-protective behaviors among pregnant women regarding spontaneous abortion. **Subjects and Method:** A descriptive study design was used. The study was conducted in Egypt at the out-patients' clinics of obstetrics departments of Tanta University Hospitals affiliated to Ministry of High Education and Scientific Research and El-Menshaway General Hospital affiliated to Ministry of Health and Population. A purposive sample of 200 pregnant women who had past history of spontaneous abortion was selected from the previously mentioned settings. Two tools were used for data collection; Tool 1: Pregnant women's knowledge regarding spontaneous abortion, Tool 2: Women self-protective behaviors regarding spontaneous abortion. **Results:** The finding of the present study revealed that the majority of the studied pregnant women had low level of knowledge and three quarters of them had negative self-protective behaviors regarding spontaneous abortion. **Conclusion:** There are highly statistical significant relationships between women's age at marriage, educational level, occupation and their knowledge regarding spontaneous abortion. Additionally, no significant relationship exists between knowledge and self-protective behaviors regarding spontaneous abortion among the studied pregnant women. **Recommendations:** Implementation of continuous educational programs for pregnant women and newly appointed health care providers regarding self-protective behaviors of spontaneous abortion, and encouragement of early and regular antenatal care.

**Keywords:** Self-Protective Behaviors, Spontaneous Abortion.

## Introduction

Spontaneous abortion is defined as the loss of pregnancy naturally before the 20<sup>th</sup> week of gestation, or if the fetus is less than 500 grams, or his/her length is less than 25 cm (Dugas & Slane, 2022; Eldabae, 2019; Mansour, Alabiad, & Hamed, 2021). According to National Health Service, spontaneous abortion occurs in at least 15-20% of pregnancies (Zakira & Hardianto, 2021).

The reasons of spontaneous abortion are varied and can be caused by many factors. The most common cause for first-trimester abortions is chromosomal abnormalities and placental abnormalities. (Abdelghani, Mahdi, Abohashim, & Alqaed, 2023; Zakira & Hardianto, 2021).

The reasons of the second trimester pregnancy loss are more likely due to maternal conditions, for example incompetent cervix, congenital or acquired anomaly of the uterine cavity, hypothyroidism, diabetes mellitus, and chronic nephritis. In addition to consumption of crack cocaine, inherited and acquired thrombophilias, lupus, and acute infection (Abdelghani et al., 2023; Franjic, 2021; Pun, Silwal, Poudel, & Panthee, 2021; Zakira & Hardianto, 2021).

The main types of abortion identified by Royal College of Obstetrics and Gynecology (RCOG) are threatened miscarriage, inevitable miscarriage, incomplete miscarriage, full miscarriage, missed and recurrent miscarriage (Al-Eidan, Alghaneem, AlMosfer, & AlZahrani, 2017; Nanko & Mari, 2022). Although the reason of the most of pregnancy loss is usually out of a woman's control, the pregnant woman is having a chance for successful pregnancy by improving their knowledge and

following a healthy lifestyle during pregnancy regarding spontaneous abortion.

Changing unhealthy lifestyle to a healthy one is crucial during pregnancy. Pregnant women can follow a healthy lifestyle through eating healthy diet and avoiding eating preserved foods, avoiding obesity, smoking, caffeine, lifting heavy stuff, several climbing stairs and exposure to radiography. In addition, they can take folic acid daily, and monitor chronic diseases (Eldabae, 2019; Nguyen et al., 2022).

The nurses must integrate their multidisciplinary professional roles for dealing with women suffering from spontaneous abortion. As nurses as a direct care provider must provide evidence based practice for caring of such women, and must keep in mind psychological status of these women (Bailey & Nevill, 2020).

Miscarriage is the biggest reproductive health crisis in the history of our species (Miller, 2023). Spontaneous abortion is one of the most common causes of maternal morbidity and mortality during reproductive period, especially in developing countries (Pun et al., 2021). Empowerment of the women is also a crucial strategy for decreasing maternal mortality through enhancement of their self-protective behaviors' education and early intervention because it allows them to make crucial decisions about their own health and take timely steps to access health care (Mwilike et al., 2018; Zaki, Fouad, & khedr, 2021).

**The aim of this study is** to identify self-protective behaviors among pregnant women regarding spontaneous abortion.

**Research Question:** What are the self-protective behaviors among pregnant women regarding spontaneous abortion?

## Subjects and method

**Study Design:** A descriptive research design was used to conduct this study.

**Setting:** The study was conducted in Egypt at the out-patients' clinics of obstetrics departments of: Tanta University Hospitals affiliated to Ministry of High Education and Scientific Research and El-Menshawey General Hospital affiliated to Ministry of Health and Population.

**Subjects:** A purposive sample of 200 pregnant women was selected from the previously mentioned settings and fulfilling the following inclusion criteria; age ranged between 18-45 years old, past history of spontaneous abortion, at the first trimester of pregnancy, and with normal current pregnancy course (free from any medical or obstetrical complications).

### Tools of data collection

To achieve the aim of this study the following two tools were used.

**Tool I: Pregnant women's knowledge regarding spontaneous abortion: It included three parts as follow:**

**Part (1): Bio-socio-demographic data of the pregnant women.**

It was used to collect data about pregnant women's bio-socio-demographic characteristics such as; age, age at marriage, marital status, place of residence, , women's education, husband's education, women's occupation, husband's occupation and family income.

**Part (2): Obstetric history of the studied pregnant women.**

It included information about obstetrics characteristics of the pregnant women such as; gravidity, parity, date of the last menstrual period, current gestational age, history of spontaneous abortion, regularity of antenatal follow-up visits

during current pregnancy, as well as number and place of antenatal visit.

**Part (3): Pregnant women's knowledge regarding spontaneous abortion.**

It was used to assess knowledge of the studied pregnant women about spontaneous abortion. It included 6 items as follows; definition, risk factors, causes, types, signs and symptoms, complications, and women's source of knowledge regarding spontaneous abortion.

**The scoring system of pregnant women's knowledge regarding spontaneous abortion was as follow:**

- Correct and complete answer was given a score of (2).
- Correct and incomplete answer was given a score of (1).
- Incorrect and don't know was given a score of (0).

**The total knowledge score was calculated according to (6 questions x 2= 12) which was converted into percentage and categorized as follows:**

- High level of knowledge  $\geq 75\%$  of the total score (9-12 scores).
- Moderate level of knowledge  $50 - < 75\%$  of the total score (6-9 scores).
- Low level of knowledge  $< 50\%$  of the total score. (0-9 scores).

**Tool (II): Pregnant women's self-protective behaviors during pregnancy regarding spontaneous abortion.** It

consisted of 17 statements such as; folic acid intake, early follow-up, avoid lifting heavy things, avoid tension and stress, eat more vegetables, avoid eating dates, etc.

**Scoring system of the studied pregnant women's self- protective behaviors during pregnancy regarding spontaneous abortion was as follow:**

**Each statement was rated by using 5 points likert scale, where**

- (Always) answer was given a score of (4).
- (Often) answer was given a score of (3).
- (Sometimes) answer was given a score of (2).
- (Rarely) answer was given a score of (1).
- (Never) answer was given a score of (0).
- **The total score of women's self-protective behaviors was calculated according to (17 statements x 4= 68) which was converted into percentage and categorized as follows**
- Positive self-protective behaviors  $\geq 50\%$  of the total score (34-68).
- Negative self-protective behaviors  $< 50\%$  of the total score (0-33)

### Method

The current study was implemented according to the following steps:-

1. **Administrative design:** An official letter clarifying the purpose of the study was obtained from the Faculty of Nursing Tanta University and was submitted to the responsible authorities of the selected study settings to obtain their approval and cooperation for carrying out the study.
2. **Ethical consideration**  
Approval of the Scientific Research Ethics' Committee was obtained (code 209/2/2023). The aim of the study was explained to the study subjects in order to obtain their acceptance and cooperation, as well as their informed consent. The right to abstain or terminate participation at any time is allowed. The nature of the study didn't cause any harm or pain for the entire sample. Assuring the women about the privacy and confidentiality of the collected data was maintained and that the data are used only for the study purpose.
3. **Tool development**
  - Tool (I) was developed by the researcher from recent review of related literatures. Tool (II) was adapted from (Mahmoud,

**Al-Hakak, & Jawad, 2017; Nguyen et al., 2022; Nurhasanah, Masrul, Malini, & Tarawan, 2020).**

- The study tool (questionnaire) was tested for face and content validity by a jury of five experts from maternal and neonatal health nursing department. The face validity of the questionnaire was calculated based on experts' opinion and it was 98% and the content validity index (%) of its items was 97% for the spontaneous abortion's knowledge questionnaire and 96% for the self-protective behaviors during pregnancy regarding spontaneous abortion questionnaire.
  - A pilot study was carried out on 10% of the total sample (20 pregnant women) before the actual data collection and was excluded from the current study sample.
- The purposes of pilot study were to:** Ascertain the feasibility and applicability of the developed tools and to detect any problems peculiar to clarity of the statements that might interfere with the process of data collection.
- To assess the tools' reliability, the pilot study data were tested by calculating Cronbach's Alpha which was 0.904 for the knowledge questionnaire and 0.878 for the self-protective behaviors during pregnancy regarding spontaneous abortion questionnaire.
4. **Data collection (field work):-** The researcher introduced herself to each woman. Data were collected by using the pre developed study tools (structured questionnaires) that were applied individually for each woman in the morning shifts at out-patient clinics of obstetrics departments of the previously mentioned study settings from 9:00 a.m. to 1.00 p.m., three days per week.
    - **Tool I; part (1), and part (2)** were used to collect the bio-socio-demographic

characteristics, medical, surgical and obstetrics history of the studied pregnant women, while **part (3)** was used to assess the pregnant women's knowledge regarding spontaneous abortion. **Tool II:** was utilized to assess women's self-protective behaviors during pregnancy regarding spontaneous abortion.

-Filling the questionnaire needed approximately 15-20 minutes.

-After collecting the required data, an instructional brochure regarding spontaneous abortion was given to women up on their request to improve their knowledge regarding spontaneous abortion.

-Data collection was carried out over a period of six months started from the start of May 2023 until the end of October 2023

### Statistical analysis

The collected data were coded, entered, tabulated and analyzed using SPSS (Statistical Package for Social Science) version 25 (IBM Corporation, Armonk, NY, USA). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data frequency, percentage or proportion of each category was calculated. For comparison between means of two groups of non-parametric data of independent samples, Z value of Mann-whitney test was used. For comparison between more than two means of non-parametric data, Kruskal-Wallis ( $\chi^2$ ) was calculated. Correlation between variables was evaluated using Pearson's correlation coefficient (r). Significance was adopted at  $p < 0.05$  for interpretation of results of tests of significance (Dawson & Trapp, 2001)

### Results

**Table (1):** Shows bio-socio-demographic characteristics of the studied pregnant women with past history of spontaneous abortion. It reveals that the age of slightly less than three quarters (71.0%) of the studied pregnant women ranged from 19 to 39 years with a mean age  $27.37 \pm 4.20$ . Concerning their residence, it was noticed that the majority (93.0%) of the studied pregnant women were from rural areas, the entire sample (100.0 %) were married, and slightly more than one-half (55.5%) of them were married at the age of 15-20 years. As regards to the educational level, it was reported that slightly less than one-half (45.5 %) of the studied pregnant women had secondary school education. It was also observed that slightly more than three quarters (77.5%) of the studied pregnant women were housewives.

**Figure (1):** Illustrates frequency distribution of past spontaneous abortions among the studied pregnant women with abortion. It demonstrates that slightly less than four fifths (79.5 %) of the studied pregnant women had one previous abortion, and slightly less than one fifth (16%) of them had two abortions.

**Table (2):** Reports the mean score of the studied pregnant women's knowledge regarding spontaneous abortion. It reveals that the total mean score of the studied pregnant women's knowledge was  $(2.61 \pm 1.68)$ .

**Table (3):** Displays the mean score of the studied pregnant women's self-protective behaviors during pregnancy regarding spontaneous abortion. It presents that eating more vegetables had the first rank of self-protective behaviors during pregnancy with a mean  $1.63 \pm 1.46$ , and the total mean score was  $23.99 \pm 8.83$ .

**Figure (2):** Exemplifies the total score level of the studied pregnant women's

knowledge regarding spontaneous abortion. It proves that the majority (93.5%) of the studied pregnant women had low level of knowledge regarding spontaneous abortion, compared to only (6.0% and 0.5% respectively) of them who exhibited moderate and high level of knowledge regarding spontaneous abortion.

**Figure (3):** Elucidates the total score level of the studied pregnant women's self-protective behaviors during pregnancy regarding spontaneous abortion. It clarifies that exactly three quarters (75.0%) of the studied pregnant women had negative self-protective behaviors during pregnancy regarding spontaneous abortion, and only one quarter (25.0%) of them had positive self-protective behaviors during pregnancy regarding spontaneous abortion.

**Table (4):** Elucidates the relationship between total score level of the studied pregnant women's knowledge regarding spontaneous abortion and their bio-socio-demographic characteristics. It portrays that there was a highly statistically significant relationship between women's age at marriage, women's educational level, husband's educational level, women's occupation, husband's occupation family income from women's point of view and their total score level of knowledge regarding spontaneous abortion ( $p= 0.0001^*$ ,  $0.0001^*$ ,  $0.0001^*$ ,  $0.003^*$ ,  $0.0001^*$  and  $0.001^*$  respectively). Conversely, there was no significant relationship between women's age, women's residence, the consanguinity between women and their husbands, type of family, number of family members and their total score level of knowledge regarding spontaneous abortion ( $p= 0.096$ ,  $0.103$ ,  $0.152$ ,  $0.068$  and  $0.067$  respectively).

**Table (5):** Establishes the relationship between total score level of self-protective behaviors of the studied pregnant women regarding spontaneous abortion and their bio-socio-demographic characteristics. It that there was a statistical significant relationship between women's educational level and their total score level of self-protective behaviors during pregnancy regarding spontaneous abortion ( $p=0.010^*$ ). It was also noticed that there was no statistical significant relationship between women's age, women's residence, age at marriage, husband's educational level, women's occupation and their total score level of self-protective behaviors during pregnancy regarding spontaneous abortion ( $p=0.713$ ,  $0.321$ ,  $0.980$ ,  $0.282$  and  $0.641$  respectively).

**Table (6):** Shows the relationship between total score level of knowledge of the studied pregnant women regarding spontaneous abortion and their obstetric history. It exposes that there was a statistical significant relationship between women's parity, history of previous stillbirth, start of the first antenatal visit, place of current antenatal care and their total score level of knowledge regarding spontaneous abortion ( $P= 0.006^*$ ,  $0.009^*$ ,  $0.001^*$  and  $0.015^*$  respectively). On the other hand, there was no statistical significant relationship between gravidity, history of previous preterm labor, history of previous low birth weight baby, number of antenatal visits during current pregnancy, number of previous abortions and their total score level of knowledge regarding spontaneous abortion ( $p=0.614$ ,  $0.817$ ,  $0.515$ ,  $0.208$  and  $0.774$  respectively).

**Table (7):** Displays the relationship between total score level of self-

protective behaviors of the studied pregnant women regarding spontaneous abortion and their obstetric history. It demonstrates that there was a statistical significant relationship between start of the first antenatal visit, number of antenatal visits during the current pregnancy and their total score level of self-protective behaviors during pregnancy regarding spontaneous abortion ( $p= 0.001^*$  and  $0.028^*$  respectively). Conversely, there was no statistical significant relationship between gravidity, parity, history of previous stillbirth, history of previous preterm labor, history of previous low birth weight baby, place of current antenatal care, number of previous abortions and their total score level of self-protective behaviors during pregnancy regarding spontaneous abortion ( $p= 0.487, 0.600, 0.704, 0.587, 0.699, 0.243$  and  $0.617$  respectively).

**Table (8):** Explicates the relationship between the studied pregnant women's total score level of knowledge and their total score level of self-protective behaviors. It explains 93.5% had low level of knowledge, 6% had moderate level of knowledge, and 0.5% had high level of knowledge. The table also shows that 75.4% of the studied pregnant women who had low level of knowledge and 75 % of the studied pregnant women who had moderate level of knowledge had negative self-protective behaviors during pregnancy regarding spontaneous abortion, compared to only one pregnant woman (0.5%) who had high level of knowledge exhibited had positive self-protective behaviors during pregnancy regarding spontaneous abortion.

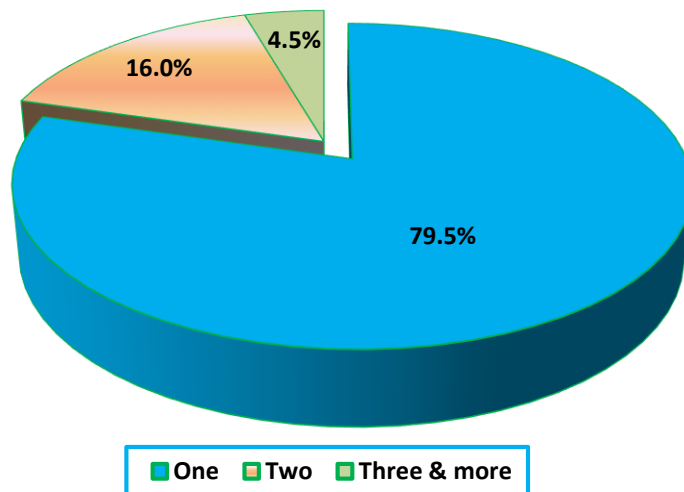
**Table (1): Bio-socio-demographic characteristics of the studied pregnant women with past history of spontaneous abortion (n=200).**

Bio-socio-demographic characteristics	The studied pregnant women	
	N	%
<b>Age (years)</b>		
19-<30	142	71.0
30-39	58	29.0
Range	19-39	
Mean±SD	27.37±4.20	
<b>Residence:</b>		
Urban	14	7.0
Rural	186	93.0
<b>Marital status:</b>		
Married	200	100
<b>Age at marriage (years):</b>		
15-20	111	55.5
>20-28	89	44.5
Range	15-28	
Mean±SD	20.41±2.34	
<b>Duration of marriage (years)</b>		
1-10	163	81.5
>10-21	37	18.5
Range	1-21	
Mean±SD	6.97±4.02	
<b>Women's educational levels:</b>		
Illiterate	4	2.0
Read and write	3	1.5
Primary/preparatory education	37	18.5
Secondary education	91	45.5
University education	65	32.5
<b>Husband's educational levels:</b>		
Illiterate	2	1.0
Read and write	2	1.0
Primary/preparatory education	25	12.5
Secondary education	96	48.0
University education	75	37.5
<b>Woman's occupation:</b>		
Housewife	155	77.5
Working	45	22.5
<b>Type of job if working:</b>		
Employee	8	17.8
Professional	32	71.1
Unemployed worker	5	11.1
<b>Husband's occupation:</b>		
Employee	64	32.0
Farmer	11	5.5
Professional	37	18.5
Unemployed worker	88	44.0



**Table ble (1) continues: Bio-socio-demographic characteristics of the studied pregnant women with past history of spontaneous abortion (n=200).**

Bio-socio-demographic characteristics	The studied pregnant women	
	N	%
<b>The consanguinity between women and their husband</b>		
No	174	87.0
Yes	26	13.0
<b>Type of family</b>		
Nuclear	137	68.5
Extended	63	31.5
<b>Number of family members</b>		
2-4	117	58.5
5-7	42	21.0
8-10	26	13.0
11-15	15	7.5
<b>Family income from women's point of view</b>		
Not enough	28	14.0
Enough	172	86.0
<b>Height (cm)</b>		
Range	135-175	
Mean±SD	161.10±4.10	
<b>Weight (kg)</b>		
Range	52-100	
Mean±SD	72.75±8.14	
<b>Body mass index(BMI)</b>		
Range	20.58-40.06	
Mean±SD	28.04±3.03	



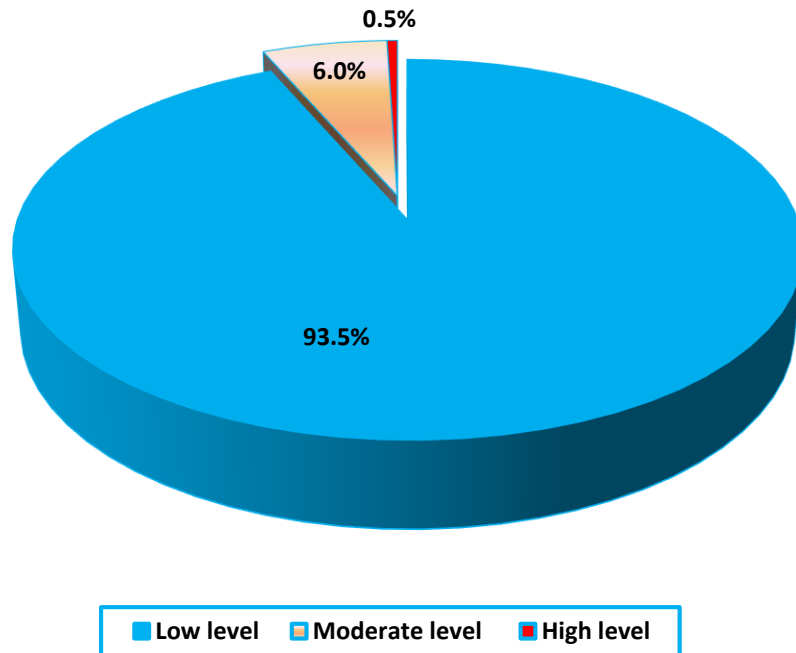
**Figure (1):** Frequency distribution of past spontaneous abortions among the studied pregnant women with abortion (n=200).

**Table (2):** Mean score of the studied pregnant women's knowledge regarding spontaneous abortion (n=200).

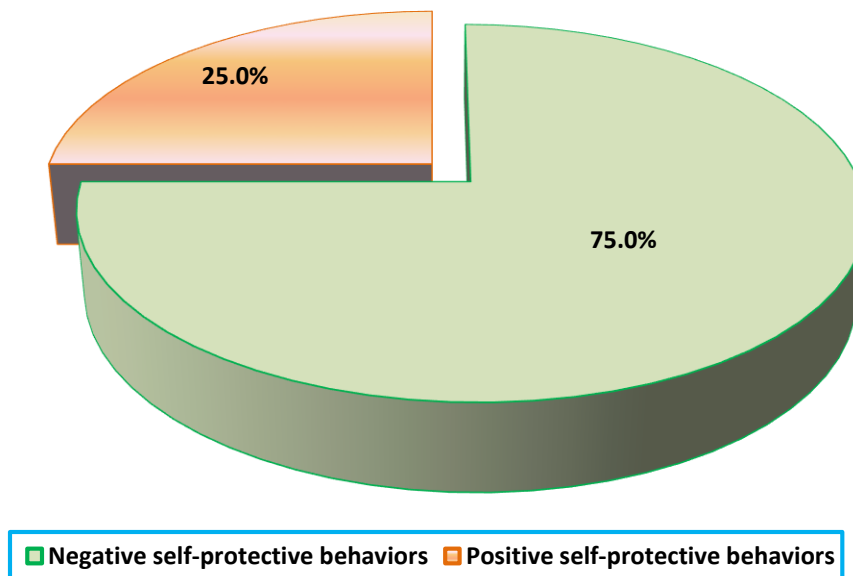
Mean score of knowledge regarding spontaneous abortion	The studied pregnant women		
	Range	Mean±SD	Rank
Definition of spontaneous abortion	0-2	0.54±0.62	3
Risk factors of spontaneous abortion	0-2	0.08±0.31	6
Causes of spontaneous abortion	0-2	0.68±0.49	2
Types of spontaneous abortion	0-2	0.16±0.40	5
Signs and symptoms of spontaneous abortion	0-2	0.96±0.27	1
Complications of spontaneous abortion	0-2	0.18±0.43	4
<b>Total knowledge score (0-12)</b>	<b>0-12</b>	<b>2.61±1.68</b>	

**Table (3): Mean score of the studied pregnant women's self-protective behaviors during pregnancy regarding spontaneous abortion (n=200).**

Mean score of self-protective behaviors during pregnancy regarding spontaneous abortion	Mean score of self-protective behaviors during pregnancy of the studied pregnant women		
	Range	Mean±SD	Rank
Taking folic acid	0-3	1.48±0.91	6
Avoiding eating raw meat	0-4	1.57±1.05	3
Reducing eating sweets	0-3	1.26±1.03	14
Early follow-up	0-4	1.06±1.18	15
Avoiding lifting heavy things	0-4	1.48±1.31	6
Maintaining her body weight	0-4	1.33±1.35	11
Avoiding drinking cinnamon	0-4	1.45±1.39	7
Avoiding excessive activity	0-4	1.36±1.50	10
Avoiding eating canned foods	0-4	1.43±1.36	8
Avoiding tension and stress	0-4	1.49±1.41	5
Eating more vegetables	0-4	1.63±1.46	1
Avoiding eating a lot of carbohydrates and fats	0-4	1.59±1.39	2
Staying away from newly painted places	0-4	1.28±1.23	13
Avoiding frequent climbing stairs	0-4	1.55±1.22	4
Avoiding contact with pets	0-4	1.32±1.35	12
Practice daily walking for 30 minutes	0-4	1.06±0.89	15
Avoiding eating dates	0-4	1.41±1.47	9
<b>Total self-protective behaviors score (0-68)</b>	<b>5-46</b>	<b>23.99±8.83</b>	



**Figure (2): Total score level of the studied pregnant women's knowledge regarding spontaneous abortion (n=200).**



**Figure (3): Total score level of the studied pregnant women's self-protective behaviors during pregnancy regarding spontaneous abortion (n=200 )**

**Table (4): Relationship between total score level of knowledge of the studied pregnant women regarding spontaneous abortion and their bio-socio-demographic characteristics (n=200).**

Socio-demographic characteristics	No.	Total knowledge score of the studied pregnant women			
		Mean±SD	Z value	$\chi^2$ value	P value
<b>Age (years)</b>					
19-<30	142	2.74±1.74	1.667		0.096
30-39	58	2.31±1.49			
<b>Residence</b>					
Urban	14	3.36±1.8	1.630		0.103
Rural	186	2.56±1.65			
<b>Age at marriage (years)</b>					
15-20	111	2.04±1.20	5.525		0.0001*
>20-28	89	3.34±1.91			
<b>Women's educational levels</b>					
Illiterate	4	0.50±0.58	77.071		0.0001*
Read and write	3	1.67±1.53			
Primary/preparatory education	37	1.24±0.76			
Secondary education	91	2.48±1.23			
University education	65	3.75±1.87			
<b>Husband's educational levels</b>					
Illiterate	2	0.50±0.71	58.364		0.0001*
Read and write	2	2.50±0.71			
Primary/preparatory education	25	1.20±1.04			
Secondary education	96	2.33±1.36			
University education	75	3.51±1.78			
<b>Women's occupation</b>					
Housewife	155	2.12±1.18	3.002		0.003*
Working	45	4.31±2.03			
<b>Husband's occupation</b>					
Employee	64	2.86±1.42	48.323		0.0001*
Farmer	11	1.45±1.21			
Professional	37	4.03±2.14			
Unemployed worker	88	1.99±1.22			
<b>The consanguinity between women and their husband</b>					
No	174	2.53±1.54	1.432		0.152
Yes	26	3.15±2.38			
<b>Type of family</b>					
Nuclear	137	2.70±1.57	1.827		0.068
Extended	63	2.43±1.90			
<b>Number of family members</b>					
2-4	117	2.80±1.64	7.148		0.067
5-7	42	2.26±1.36			
8-10	26	2.73±2.37			
11-15	15	1.93±1.10			
<b>Family income from women's point of view</b>					
Not enough	28	1.71±1.08	3.429		0.001*
Enough	172	2.76±1.72			

\*Statistically significant (P&lt;0.05)

**Table (5): Relationship between total score level of self-protective behaviors of the studied pregnant women regarding spontaneous abortion and their bio-socio-demographic characteristics (n=200).**

Socio-demographic characteristics	No.	Total self-protective behaviors during pregnancy of the studied pregnant women			
		Mean±SD	Z value	$\chi^2$ value	P value
<b>Age years</b>					
19-<30	142	23.84±8.90	0.368		0.713
30-39	58	24.38±8.74			
<b>Residence</b>					
Urban	14	26.36±7.10	0.993		0.321
Rural	186	23.82±8.94			
<b>Age at marriage (years)</b>					
15-20	111	23.98±8.67	0.025		0.980
>20-28	89	24.01±9.00			
<b>Women's educational levels</b>					
Illiterate	4	19.25±11.24	5.051	13.242	0.010*
Read and write	3	22.36±8.38			
Primary/preparatory education	37	25.35±9.08			
Secondary education	91	25.25±8.77			
University education	65	36.00±1.00			
<b>Husband's educational levels</b>					
Illiterate	2	20.50±19.09	5.051	13.242	0.282
Read and write	2	12.00±4.24			
Primary/preparatory education	25	23.12±6.86			
Secondary education	96	24.00±9.39			
University education	75	24.69±8.44			
<b>Woman's occupation</b>					
Housewife	155	23.44±8.52	0.466		0.641
Working	45	24.15±8.94			
<b>Husband's occupation</b>					
Employee	64	23.78±9.06	3.381		0.337
Farmer	11	21.09±6.56			
Professional	37	25.86±8.56			
Unemployed worker	88	23.73±9.01			
<b>The consanguinity between women and their husband</b>					
No	174	23.79±8.92	0.790		0.430
Yes	26	25.35±8.26			
<b>Type of family</b>					
Nuclear	137	24.46±8.60	1.075		0.282
Extended	63	22.98±9.31			
<b>Number of family members</b>					
2-4	117	24.08±8.34	1.501		0.682
5-7	42	25.73±7.68			
8-10	26	24.24±9.90			
11-15	15	22.23±9.98			
<b>Family income from women's point of view</b>					
Not enough	28	23.93±8.76	0.108		0.914
Enough	172	24.39±9.40			

\*Statistically significant (P&lt;0.05)

**Table (6): Relationship between total score level of knowledge of the studied pregnant women regarding spontaneous abortion and their obstetric history (n=200).**

Obstetric history	No.	Total knowledge score of the studied pregnant women			
		Mean±SD	Z value	$\chi^2$ value	P value
<b>Gravidity</b>					
One	1	2.00	0.975		0.614
Two	19	2.47±1.87			
Three & more	180	2.63±1.67			
<b>Parity</b>					
No previous birth	20	2.25±1.48	12.603		0.006*
One	56	2.70±2.08			
Two	88	2.92±1.58			
Three & more	36	1.94±1.07			
<b>History of previous stillbirth</b>					
No	192	2.67±1.68	2.605		0.009*
Yes	8	1.25±1.03			
<b>History of previous preterm labor</b>					
No	197	2.62±1.69	0.232		0.817
Yes	3	2.33±1.53			
<b>History of previous low birth weight baby</b>					
No	179	2.61±1.73	0.651		0.515
Yes	21	2.67±1.20			
<b>Start of the first antenatal visit</b>					
In the first month of pregnancy	191	2.68±1.68	3.189		0.001*
In the second month of pregnancy	9	1.11±0.93			
<b>Number of antenatal visits</b>					
One time	21	2.05±1.32	3.138		0.208
Two times	131	2.66±1.70			
Three times or more	48	2.73±1.76			
<b>Place of current antenatal care</b>					
Governmental hospital	3	0.67±0.58	2.424		0.015*
Private hospital/clinic	197	2.64±1.68			
<b>Number of previous abortions</b>					
One	159	2.66±1.78	0.514		0.774
Two	32	2.47±1.13			
Three & more	9	2.33±1.66			

\*Statistically significant (P&lt;0.05)

**Table (7): Relationship between total score level of self-protective behaviors of the studied pregnant women regarding spontaneous abortion and their obstetric history (n=200).**

Obstetric history	No.	Total self-protective behaviors during pregnancy of the studied pregnant women			
		Mean±SD	Z value	$\chi^2$ value	P value
<b>Gravidity</b>					
One	1	34.00	1.441		0.487
Two	19	22.74±8.52			
Three & more	180	24.07±8.87			
<b>Parity</b>					
No previous birth	20	21.40±8.69	1.868		0.600
One	56	24.80±9.63			
Two	88	23.81±8.02			
Three & more	36	24.64±9.56			
<b>History of previous stillbirth</b>					
No	192	24.00±8.78	0.331		0.704
Yes	8	23.87±10.74			
<b>History of previous preterm labor</b>					
No	197	24.04±8.89	0.544		0.587
Yes	3	21.00±0.01			
<b>History of previous low birth weight baby</b>					
No	179	24.08±8.95	0.387		0.699
Yes	21	23.28±7.90			
<b>Start of the first antenatal visit</b>					
In the first month of pregnancy	191	26.11±8.25	3.003		0.001*
In the second month of pregnancy	9	23.99±8.88			
<b>Number of antenatal visits</b>					
One time	21	23.17±9.26	6.241		0.028*
Two times	131	23.92±8.68			
Three times or more	48	27.33±8.84			
<b>Place of current antenatal care</b>					
Governmental hospital	3	23.86±8.83	1.168		0.243
Private hospital/clinic	197	33.00±1.73			
<b>Number of previous abortions</b>					
One	159	24.97±9.95	0.967		0.617
Two	32	23.94±8.67			
Three & more	9	21.44±7.91			



**\*Statistically significant (P<0.05)****Table (8): The studied pregnant women's total score level of knowledge and their total score level of self- protective behaviors (n=200).**

Total self-protective behaviors score level during pregnancy	Total knowledge score level of the studied pregnant women					
	Low level (n=187)= 93.5%		Moderate level (n=12)= 6%		High level (n=1)= 0.5%	
	n	%	N	%	N	%
<b>Level of total self-protective behaviors scores</b>						
Negative self-protective behaviors	141	75.4	9	75.0	0	0
Positive self-protective behaviors	46	24.6	3	25.0	1	100
$\chi^2$ test	3.016					
P value	0.221					

**Dscussion**

Spontaneous abortion is one of the most common adverse pregnancy events that can cause great physical and psychological distress to couples. Approximately 10-20% of pregnancies result in a spontaneous abortion by the 13<sup>th</sup> gestational week. It might be due to lack of knowledge, awareness and ignorance of some preventive steps (Singh, Gautam, & Jeyaseelan, 2023; Tyagi, Hamouda, Ateya, & Ali, 2021). Self-protective behaviors during pregnancy can have significant impact on reducing pregnancy-related complications such as spontaneous abortion. So, healthy practices can positively affect the health condition of pregnant women and the development of their fetuses (Nguyen et al., 2022; Nurhasanah et al., 2020).

Clinical attention has mainly focused on the precautions and prevention of early pregnancy loss (Singh et al., 2023; Tyagi et

al., 2021). However, inadequate studies were done to address self-protective

behaviors of pregnant women regarding spontaneous abortion. Therefore, the present study was conducted to assess the knowledge and self-protective behaviors of pregnant women regarding spontaneous abortion.

**Concerning bio-socio-demographic characteristics of the studied pregnant women with previous history of spontaneous abortion**, the findings of the present study revealed that the age of slightly less than three quarters of the studied pregnant women ranged from 19 to 39 years with a mean age  $27.37 \pm 4.20$ . This finding comes in accordance with **Pun et al., (2021)** who reported that the mean age of the respondents was  $(28.36 \pm 6.07)$ . Additionally, **Chanomethaporn et al., (2018)** mentioned that the mean age of the study participants was  $(28.5 \pm 4.7)$ . On the other hand, this finding is in disagreement with **Klu (2022)** who indicated that approximately less than

two fifths of their respondents aged 30–39 years old. Additionally, **Giotta, Bartolomeo, and Trerotoli, (2023)** found that slightly less than one third of the study sample. **Regarding place of residence**, the current study revealed that the majority of the studied pregnant women were from rural areas. This result is strongly in agreement with **Eldabae (2019)** who found that the majority of the studied women were from rural areas, while it is contradicted with **Ahmad & Kareem (2020)** who revealed that less than three quarters of the respondents were from urban areas. **Pertaining to the age at marriage**, the current study indicated that slightly more than one-half of the studied pregnant women were married at the age 15-20 years. Similarly, **Moradinazar et al., (2020)** found that first marriage age is 16-20 years old in less than one-half of the participants in their study. In addition, **Alam (2021)** who assessed miscarriage and associated factors mentioned that less than one-half of their participants married at age 17 years and under. **Conversely, Mekonnen and Awoke (2020)** pointed out that slightly more than two fifths of the women had their first marriage at 20-24 years old in their study. **Concerning the studied pregnant women's educational level**, it was reported that slightly less than one-half of the studied pregnant women had secondary education. Similarly, is a study conducted by **Omer, Elsheikh, Saeid, & Ali, (2022)** to assess knowledge and attitude of recently aborted women in relation to family planning methods. They found that slightly more than one third of the studied women had secondary school education. On the other hand, this finding is dissimilar to **Salama, Abou-Shabana, Attiat Allah, and Mohammed, (2020)** who revealed that

slightly more than one third of the women had high level of education in their study. **Wassie, Lemlem, Boka, and Gelaw, (2019)** also reported that slightly less than one-half of the study participants had illiterate mother in their study. **Pertaining to the women's occupation**, slightly more than three quarters of the studied pregnant women were housewives. This finding is consistent with **Abd Elsalam, Wassif, Eltaieb, & Abou Talib, (2019)** who reported that the majority of the women were not working. In contradiction with the current study are **Dickson, Adde, & Ahinkorah, (2018)** who revealed that slightly less than one third of the respondents were employed in their study of socio – economic determinants of abortion among women in Mozambique and Ghana. **As regard to number of previous spontaneous abortion**, the current study revealed that slightly less than four fifths of the studied pregnant women mentioned that they had one previous abortion. Likewise, **Abd Elsalam et al., (2019)** reported that three quarters of the study subjects had one previous spontaneous abortion in their study. On contrast, **Ticconi et al., (2020)** revealed that slightly more than one-half of the women had  $\geq 3$  pregnancy losses in their study of Chinese traditional herbs enhanced the clinical efficacy of low-molecular-weight heparin in the treatment of recurrent spontaneous abortion complicated with thrombophilia.

**Regarding the total score level of knowledge among the studied pregnant women regarding spontaneous abortion**, the current study noticed that the majority of the studied pregnant women had low level of knowledge regarding spontaneous abortion. From the researcher's point of view, the result of the present study may be attributed to the fact that the majority of the women in

the current study were housewives, from rural areas and didn't attend any health education sessions/programs during antenatal visits regarding spontaneous abortion.

**Concerning to the total mean score of the studied pregnant women's knowledge regarding spontaneous abortion,** the current study revealed that the total mean score of the studied pregnant women's knowledge was  $(2.61 \pm 1.68)$ . This finding is in agreement with **Nurhasanah et al., (2020)** who conducted a study of a structure equation model examining self-care behavior toward pregnancy-related complication and their associated factors among women in Indonesia. They found that the average score of knowledge on self-care of pregnancy-related complications was 11.85 (SD = 1.98), with a range of 8 to 21 which shows that the knowledge of pregnant women about pregnancy-related complications was still low.

**Regarding the mean score of self-protective behaviors during pregnancy of the studied pregnant women regarding spontaneous abortion,** it was found that the total mean score was  $23.99 \pm 8.83$ . This finding is dissimilar to **Nurhasanah et al. (2020)** who found that the pregnant women had moderate self-care behaviors with a mean  $\pm$ SD of  $156.5 \pm 16.91$ .

**Concerning the relationship between the studied pregnant women's total score level of knowledge and total score level of self-protective behaviors.** The current study revealed that there was no significant relationship between **the** total score level of knowledge and **the** total score level of self-protective behaviors regarding spontaneous abortion among the studied pregnant women ( $p= 0.221$ ). This finding is in line with **Mu, He, Wang, and Wang, (2024)** who revealed

that there was no significant relationship between **the** total knowledge score level about pregnancy loss and practice toward pregnancy loss ( $p=0.310$ ). Additionally, **Nurhasanah et al., (2020)** revealed that self-care behaviors toward pregnancy-related complication was negatively associated with knowledge of pregnancy-related complications ( $p=0.26$ ).

**Regarding the relationship between total score level of knowledge of the studied pregnant women regarding spontaneous abortion and their bio-socio-demographic characteristics,** the finding of the present study revealed that there was no significant relationship between women's age and total score level of knowledge ( $p=0.096$ ). This finding is similar to **Chanomethaporn et al., (2018)** who said that there is no significant relationship between miscarriage and age ( $p=0.61$ ). The current study stated that there was a highly statistical significant relationship between women's knowledge regarding spontaneous abortion and their educational level, occupation, and family income ( $p= 0.0001^*$ ,  $0.003^*$  and  $0.001^*$  respectively). This finding is in agreement with **Mu et al. (2024)** who revealed that there was a significant relationship between women's knowledge about pregnancy loss and their educational level, occupation, and family income ( $p= p < 0.001^*$ ,  $0.002^*$  and  $< 0.001^*$  respectively). **Regarding the relationship between the total score level of self-protective behaviors of the studied pregnant women regarding spontaneous abortion and their bio-socio-demographic characteristics,** the present study revealed that there was a significant relationship between self-protective behaviors during pregnancy regarding spontaneous abortion and their educational level ( $p=0.010^*$ ). However, there was no significant

relationship between self-protective behaviors during pregnancy regarding spontaneous abortion and women's age and occupation, and husband's educational level ( $p=0.713$ ,  $0.980$ , and  $0.282$  respectively). This result is in line with **Gebremariam, Tesfai, Tewelde, Kiflemariam, and Kibreab, (2023)** who reported that there was no significant relationship between total score level of self-protective behaviors during pregnancy and the respondents' age in (years), husband's education, level of education, and women's occupation ( $0.083$ ,  $0.469$ , and  $0.872$  respectively). **As regard to relationship between the total score level of knowledge of the studied pregnant women regarding spontaneous abortion and their obstetric history**, the current study showed that there was a significant relationship between women's parity and their total score level of knowledge regarding spontaneous abortion ( $P= 0.006^*$ ). This finding is dissimilar to **Mu et al. (2024)** who revealed that there was no significant relationship between women's times of previous live births and their knowledge score about pregnancy loss ( $P= 0.146$ ). On the other hand, the current study showed that there was no significant relationship between number of previous abortions and their total score level of knowledge regarding spontaneous abortion ( $p= 0.774$ ). This finding is in line with **Mu et al. (2024)** who showed that there was no significant relationship between women's times of previous abortion and their knowledge score about pregnancy loss ( $p= 0.193$ ). **As regard to the relationship between total score level of self-protective behaviors of the studied pregnant women regarding spontaneous abortion and their obstetric history**. It is observed that there was no significant relationship between total score

level of self-protective behaviors and gravidity and parity ( $p= 0.487$  and  $0.600$  respectively). This finding is in disagreement with **Gebremariam et al., (2023)** who found that the level of gravidity and parity of the mothers showed statistical significant associations to their level of practice ( $p < 0.003$  and  $<0.001$  respectively).

### Conclusion

**Based on the findings of the present study, it can be concluded that** the research question has been answered. This was very evident as the majority of the studied pregnant women with past history of spontaneous abortion had low level of knowledge regarding spontaneous abortion, three quarters had negative self-protective behaviors, no significant relationship exists between the total knowledge score level and the total score level of self-protective behaviors regarding spontaneous abortion among the studied pregnant women with past history of spontaneous abortion. Additionally, there was a highly statistically significant relationship between women's total score level of knowledge regarding spontaneous abortion and their age at marriage, educational level, and occupation, and husband's educational level, and occupation, and family income from the women's point of view.

### Recommendations

**Based on the findings of the current study, the following recommendations are derived and suggested:**

- Provision of appropriate and accessible posters and booklets in Arabic language containing basic needed information about self-protective behaviors regarding spontaneous abortion at all women's healthcare settings.

- Continuous educational programs for pregnant women and newly appointed health care providers about health promotion of pregnant women regarding self-protective behaviors of spontaneous abortion.

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