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Original Article

Effectiveness of Health Education Program on the Level of Knowledge and Attitude of Pregnant Women Regarding Obstetric Danger Signs in Upper Egypt

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Abstract

Background & Objective(s): The present study aimed to assess women's knowledge and attitude towards ODS (obstetric danger signs) among pregnant women in Upper Egypt and improve women's knowledge through the implementation of an educational program.

Methods: a quasi-experimental study was conducted among 300 pregnant women attending antenatal clinics. Data collection was done using structured questionnaires which were distributed to the participants during face to face interview with the researchers. An educational program was implemented to enhance women's knowledge of ODS. Data analysis was done using the SPSS program, version (24).

Results: A total of 300 pregnant women were enrolled in the present study. Socio-demographic factors such as increased age, higher educational level, rural residence, and larger family size were shown to significantly influence knowledge about obstetric danger signs. Furthermore, antenatal and obstetric risk factors such as high parity, more number of antenatal visits, history of abortion or medical disease and previous exposure to ODS were shown to be significantly associated with more knowledge about ODS. Logistic regression analysis revealed that the significant predictors that influence the participants' knowledge were women's education and the number of antenatal visits. Most of the study participants had a positive attitude towards ODS (82.3%). The overall knowledge score was increased significantly after the implementation of the educational program from 9.4±4.97 to 27.93±4.4.

Conclusion: The study revealed that most of the study participants had a positive attitude towards ODS. The implementation of an education program had a positive effect on increasing women's knowledge about ODS. Health care providers should educate the women about ODS during their antenatal visits as they are the primary source of women's knowledge.

Keywords: Knowledge, attitude, educational program, obstetric danger signs, pregnant women

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INTRODUCTION

Complications of pregnancy are encountered in many developing countries.(1) The total number of maternal deaths due to complications of pregnancy, labor, and puerperium was 303,000 in 2015.(2) Nearly 99% of the global maternal deaths in 2015 are occurring in developing countries and most of these deaths are occurring in sub-Saharan Africa where most of the women have deficient knowledge about obstetric danger signs (ODS).(3,4) Direct obstetric causes as hemorrhage, hypertensive diseases of pregnancy, maternal infections, and abortion are responsible for 73% of all maternal deaths.(5,6) The Millennium Development Goals (MDGs) adopted in 2000 were eight goals with measurable targets, one of its targets was reduction of maternal mortality and increasing access to reproductive health care (Goal 5). In 2015, the MDGs were superseded by the Sustainable Development Goals (SDGs). The target was to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030.(7)

In Egypt, maternal mortality ratio (MMR)reached to 53 deaths per 100 000 live births in 2003, but it gradually declines to be 43.6 deaths per 100 000 live births in 2017. However, maternal mortality rate is higher in Upper Egypt than Lower Egypt (74 versus 61%, respectively).(8) The

recognition of obstetric danger signs and contact the health care system by the women and their families play an important role in preventing and reducing maternal morbidities and mortalities.[9] The most common ODS during pregnancy are intense vaginal bleeding, blurred vision, and swollen hands and face. ODS encountered during labor and childbirth are severe vaginal bleeding, convulsions, prolonged labor, and retained placenta. Danger signs occurring during the postpartum period include severe bleeding following childbirth, loss of consciousness, and high-grade fever.[10,11] Early recognition of ODS is of essential importance in appropriate timely referral to obstetric care.[12] Raising awareness of women on danger signs during pregnancy, childbirth and the postpartum period improve mother's attitude to seek medical care and is crucial for safe motherhood.[13]

This study was therefore implemented to identify knowledge and attitude towards ODS among pregnant women in Upper Egypt. In addition, the present study examined the effect of an educational program to improve the knowledge of women about ODS. To the best of authors' knowledge, this is the first study that shows the effect of the implementation of an education program on the improvement of knowledge of ODS.

METHODS

Study design and setting

The present study was a quasi-experimental study to determine knowledge and attitude towards ODS among pregnant women in Upper Egypt. This was followed by an educational program to enhance women's knowledge about ODS.

The present study was conducted in antenatal clinics of Women's Health Hospital, Assiut University, Egypt. Women's Health Hospital at Assiut University is the biggest university hospital in Upper Egypt. It is the main referral hospital from Beni-Suef to Aswan governorates with a yearly flow of more than 40,000 deliveries.

Sample size calculation:

The sample size was calculated using $n = \frac{Z^2\, P\,(1-p)}{d^2}$ assuming that the proportion of knowledge about ODS as 23%, 5% margin of error, and applying a confidence level of 95%.[14] The calculated sample size was 272. The sample size was 300 after adding 10% to adjust for missing data or non-response.

Eligibility criteria

- Inclusion criteria: all pregnant women attending antenatal clinics and willing to participate in the study were enrolled in the study.
- Exclusion criteria: pregnant women with a critical illness, mental disorders, and deficient communications were not enrolled in the study.

Data collection

The data was collected on randomly selected two days/week by the researchers themselves. The researchers introduced themselves to the participants and explained the purposes of the study. The participants were asked to complete an interview questionnaire to evaluate their information about ODS during pregnancy, labor, and the postpartum period. Then an educational session was conducted about ODS encountered during pregnancy, labor, and the postpartum period. The educational session was utilizing PowerPoint presentations, videos, role-plays, and posters. Every five participants took one educational session for one hour to achieve the educational goal of the program. The goal of the educational program is to enhance awareness of ODS among pregnant women. After completing the educational program, every woman was asked to fill the same questionnaire again to assess the level of knowledge after the implementation of the educational program. Data collection took 8 months from June 2019 to February 2020.

Data collection tool

The data collection tool in the present study was a structured questionnaire designed by the researchers. It was composed of four parts. The first part was about socio-demographic data such as age, educational level, occupation, residence, and family size. The second part inquired about antenatal and obstetric histories of the respondents such as parity, gestational age, number of antenatal visits, history of abortion or disease, and previous exposure to ODS. The third part consisted of 35 questions about knowledge regarding ODS occurring during pregnancy, labor and the postpartum period (8 questions about causes and effects of ODS, 13 questions about danger signs during pregnancy, 7 questions about danger signs during labor, and 7 questions about danger signs during the post-partum period). A score of 1 was given for each correct answer and a score of zero was given for incorrect answers and don't know. The total score for knowledge was calculated by summing up the responses for each participant. The Cranach's alpha of this knowledge scale was 0.7. The fourth part included 8 questions to measure pregnant women's attitudes towards ODS. The responses were based on a five-point Likert scale (strongly agree, agree, uncertain, disagree, and strongly disagree). Items of the Likert scale were scored as 5, 4, 3, 2, and 1 respectively. Negative statements were scored in the opposite direction. Scores of the eight questions were then summed. Participants who score higher than or equal to the mean value of attitude were allocated to have a positive attitude, whereas participants who score less than the mean value were allocated to have a negative attitude. Content validity of the questionnaire was assessed by three experts from departments of Obstetrics and Gynecology and Community Health Nursing at Assiut University, Egypt who checked the questionnaire for comprehensiveness and clarity.

Pilot study

It was conducted before the beginning of data collection on 30 pregnant women which were included in the total study sample because there weren't any modifications in the questionnaire. The goal of the pilot study was to assess the

face validity of the questionnaire and determine the time needed to complete it.

Statistical analysis

Data entry and data analysis were done using the IBM SPSS, version 24 (Statistical Package for Social Science). Categorical variables were described by number and percentage (No., %) while continuous variables described by the mean and standard deviation (Mean ± SD). Independent t-test, paired t-test, and ANOVA test were used for comparison between continuous variables. The linear regression model was done to detect factors that independently influence participants' knowledge regarding ODS. A p-value < 0.05 was considered statistically significant.

Ethical considerations

The research proposal was approved by the Ethical Committee of Faculty of Nursing, Assiut University, Egypt. The study conformed to the international ethics guidelines and that of declaration of Helsinki (2013). Informed written consent by signature or fingerprint was obtained from a pregnant woman who agreed to participate in the study after explaining the nature and purpose of the study. Confidentiality and privacy of the data were assured. Pregnant women had the right to refuse to participate or withdraw from the study without any rationale at any time.

RESULTS

Table (1) shows the socio-demographic features of pregnant women in Upper Egypt. The present study included 300 pregnant women, aged (18-45) years with mean±SD (26.76±5.26). Most women were from a rural area (82.3%). Slightly less than half of the studied group had secondary education. The majority of the women were housewives (91.7%). Antenatal and obstetric histories of the respondents are depicted in Table (2). Regarding the parity, 66% of the participants delivered three times or more. Most of the respondents were in the second trimester (44. 4%) and third trimester (42.3%). Seventy-seven percent of the participants had more than two antenatal visits. The history of abortion was reported by 32.7% of the participants. Only 29.7% of the respondents reported previous exposure to ODS. Almost 20% of the studied group had a medical history of some diseases such as diabetes, hypertension, and other diseases.

Figure (1) illustrated that health care providers were the main source of information about ODS among pregnant women in Upper Egypt.

Table (3) showed that age, educational level, residence, and family size were significantly associated with knowledge of ODS among pregnant women (p= 0.039, 0.000, 0.001, 0.012 respectively).

Table (4) showed that the antenatal and obstetric histories that influence knowledge of ODS among pregnant women were parity (*p*= 0.001), the number of antenatal visits (*p*= 0.001), history of abortion (*p*= 0.009) or disease (*p*= 0.001) and previous exposure to ODS (*p*= 0.001). Linear regression analysis demonstrated that high educational level and more number of antenatal visits were significantly influencing participants' knowledge regarding ODS (Table 5).

Table 1: Personal characteristics of pregnant women in Upper Egypt

Personal characteristics	No. (n=300)	%
Age		
18-26 years	148	49.3
27-35 years	115	38.4
> 35 years	37	12.3
Mean ±SD (range)	26.76±5.26 (18-45)	
Education Level		
Illiterate	49	16.3
Read and write	34	11.3
Elementary education	41	13.7
Secondary education	137	45.7
University education and above	39	13.0
Occupation		
Housewife	275	91.7
Employee	25	8.3
Residence		
Rural	247	82.3
Urban	53	17.7
Family size		
≤3	144	48.0
4-5	109	36.3
More than 5	47	15.7

Table 2: Antenatal and obstetric histories of pregnant women in Upper Egypt

Items	No. (n=300)	%
Parity		
One/twice	102	34.0
3 times or more	198	66.0
Gestational age		
First trimester	40	13.3
Second trimester	133	44.4
Third trimester	127	42.3
Number of antenatal visits		
≤2	69	23.0
> 2	231	77.0
History of Abortion		
No	202	67.3
Yes	98	32.7
Previous exposure to obstetric danger signs		
Yes	89	29.7
No	211	70.3
Disease history		
No	240	80.0
Diabetes	15	5.0
Hypertension	40	13.3
Others (anemia, respiratory disease)	5	1.7

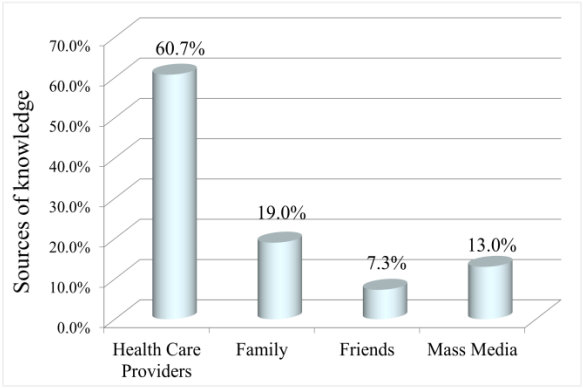

Figure 1: Sources of knowledge about obstetric danger signs among pregnant women in Upper Egypt

Table 3: Socio-demographic factors affecting knowledge of obstetric danger signs among pregnant women in Upper Egypt

	Mean Score of knowledge Mean ± SD	*p*-value
Age		
18-26 years	8.67±4.49	
27-35 years	10.06±5.13	0.039*
>35 years	10.30±5.91	
Education Level		
Illiterate	7.31±3.61	
Read and write	8.85±5.21	
Elementary education	8.05±4.97	0.000*
Secondary education	10.24±5.02	
University education and above	11±4.96	
Occupation		
Housewife	9.36±4.98	0.588**
Employee	9.92±4.84	
Residence		
Rural	9.84±5.2	0.001**
Urban	7.38±2.96	
Family size		
<3	8.55±4.84	
4-5	10±4.77	0.012*
More than 5	10.64±5.42	

*ANOVA test **Independent t-test

Figure (2) showed that the majority of women had a positive attitude towards ODS (82.3%). This was evident as 92.7% of women agreed that antenatal care is important for the health of mother and fetus, and 89.3% agreed on the importance of regular antenatal care. In addition, 85% of them agreed that knowing ODS is urgent and these signs lead to health problems of mother and fetus (Table 6).

Table (7) illustrated statistically significant improvement in all aspects of knowledge of ODS among pregnant women after the application of the educational program ($p < 0.001$).

Table4: Antenatal and obstetric risk factors affecting knowledge of obstetric danger signs among pregnant women in Upper Egypt

	Mean Score of knowledge Mean ± SD	*p*-value
Parity		
One/twice	7.83±4.8	0.001**
3 times or more	10.21±4.87	
Gestational age		
First trimester	8.53±4.58	
Second trimester	9.47±5.38	0.474*
Third trimester	9.61±4.63	
Number of antenatal visits		
≤2	7.71±4.03	0.001**
> 2	11.06±5.31	
History of Abortion		
No	9.02±4.84	0.009**
Yes	11.8±5.23	
Previous exposure to obstetric danger signs		
Yes	11.82±4.98	0.001**
No	8.38±4.61	
Disease history		
No	8.42±4.34	
Diabetes	11.82±4.69	
Hypertension	13.48±5.54	0.001*
Others (anemia, respiratory disease)	15.17±5.59	

*ANOVA test **Independent t-test

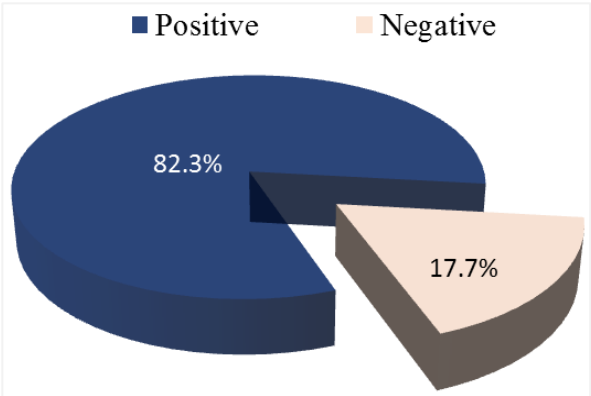

Figure 2: Attitude towards obstetric danger signs among pregnant women in Upper Egypt

Table 5: Linear regression showing the predictors of knowledge of obstetric danger signs among pregnant women in Upper Egypt

Variables	*β*	*t*	*p*-value	95% confidence interval	
				Lower Limit	Upper Limit
Age in years	0.139	-0.216	0.837	-0.01	0.024
Educational level (secondary education or more)	0.723	1.963	0.028	2.43	5.61
Residence (urban)	0.736	2.665	0.506	-0.33	0.04
Family size (>3)	-0.859	-0.833	0.405	-0.13	0.13
Parity (3 times or more)	0.473	0.420	0.675	0.40	0.83
Number of antenatal visits(>2)	0.385	2.350	0.019	0.20	0.76
History of abortion (Yes)	-0.141	0.136	0.892	-0.02	0.03
Previous exposure to ODS(Yes)	0.854	-0.761	0.447	-0.23	0.27
Disease history (Yes)	0.075	1.776	0.076	-0.26	0.01

Reference groups: education (less than secondary education), residence (rural), family size (≤3), parity (once/twice), number of antenatal visits (≤2), history of abortion (no), previous exposure to ODS (no), disease history (no).

Table 6: Attitude towards obstetric danger signs among pregnant women in Upper Egypt

	Agree/ Strongly agree		Undecided		Disagree/ Strongly disagree	
	No.	%	No.	%	No.	%
ODS are considered as complications.	226	75.3	68	22.7	6	2.0
Recognition of ODS is urgent because women have to seek immediate medical care.	255	85.0	38	12.7	7	2.3
ODS can be prevented.	179	59.7	109	36.3	12	4.0
Women who have ODS should request help from traditional birth attendants.*	60	20.0	99	33.0	141	47.0
Women who have ODS should request help from older women.*	65	21.7	110	36.7	125	41.7
Regular antenatal care is important even if there weren't any danger signs.	268	89.3	27	9.0	5	1.7
Antenatal care is important for the health of the mother and fetus.	278	92.7	16	5.3	6	2.0
Danger signs can lead to health problems of mother and fetus.	255	85.0	35	11.7	10	3.3

* Negative Statement

Table 7: Knowledge of obstetric danger signs before and after the education Program among pregnant women in Upper Egypt

Variables	Before the educational program (Mean ± SD)	After the educational program (Mean ± SD)	*p*- value
Causes and effects of obstetric danger signs	5.13±1.84	7.53±0.75	<0.001*
Danger signs during pregnancy	1.8±1.94	8.88±2.68	<0.001*
Danger signs during labor	1.17±1.01	5.78±1.19	<0.001*
Danger signs during the post-partum period	1.31±1.37	5.74±1.11	<0.001*
The total score of knowledge about obstetric danger signs	9.4±4.97	27.93±4.4	<0.001*

*Paired t-test

DISCUSSION

Deficient knowledge about ODS results in delayed seeking of medical care. This leads to serious obstetric complications that endanger the life of the mother and fetus.[15] This study found that 60.7% of women have information about danger signs from health-care providers. This finding is in agreement with other studies which showed that the majority of the study respondents had received their information about danger signs during pregnancy from health personnel.[16,17] The present study found that there was a statistically significant difference between women's age and their knowledge about ODS. The increased knowledge of ODS among older women may be related to their own prior experiences of pregnancy and labor, which serve as an important source of information. This result is in the same line with other studies which showed that age was significantly associated with women's level of knowledge.[16, 18,19] However, this result was not in the same line with a study conducted in Southeast Nigeria which reported that good knowledge about ODS is highly encountered among young women.[20] The present study showed

that women's education was significantly associated with their knowledge about ODS. This may be because an educated woman had more chances to seek services than a non-educated one. This result agreed with other studies that reported that the women who attended any formal education were more knowledgeable about ODS than women who attended no formal education.[18,19,21] In addition, Liben et al. reported that women who attended formal education were two times more likely to know about ODS as compared to women with non-formal education.[22] Rural residence was shown to have a significant association with knowledge about ODS in the present study. This finding is inconsistent with other studies which showed that urban residence had a significant association with knowledge of ODS.[19,23-25] This may be because 82.3% of study participants in this study were rural.

In the present study, women who had more than three family members were more knowledgeable about ODS, which is consistent with other studies.[22,26] This may be demonstrated by the fact that women can get information about danger signs from their family members. This study showed that there was a statistically significant association between women's knowledge of ODS and multiparity, which is in line with previous studies.[25,27] This may be because multiparous women have more experience with pregnancy and labor than others due to their multiple deliveries. In this study, respondents who had more antenatal visits were more knowledgeable than those who had less number and this is consistent with other studies.[28,29] Antenatal care provides an opportunity to counsel pregnant women about serious ODS during pregnancy. However, Mwilike et al., 2018 found that there was not any statistically significant association between women's knowledge of danger signs during pregnancy and the number of antenatal visits.[30]

In the present study, women with obstetric risk factors such as those with a history of medical disease, abortion, and previous exposure to danger signs were more knowledgeable about ODS. This may be because these obstetric risk factors increase risk perception and recognition of danger signs among the participants. Regarding women's attitude towards ODS, this study revealed that 82.3% of the studied sample had a positive attitude towards ODS. This study showed that 92.7% of women agreed that antenatal care is important for the health of mother and fetus and 89.3% agreed that regular antenatal care is an important issue. In addition, 85% of studied women agreed that knowing ODS is urgent and these danger signs lead to health problems of mother and fetus. Mekonnen et al., 2018 reported that 72.6% of the studied participants had a positive attitude towards ODS.[31] Furthermore, a study carried out in Eastern Ethiopia showed that most of the study participants agreed that knowing ODS are essential and mothers who develop these signs should seek medical care.[32] In contrast, these findings disagreed with Nurgi et al., 2017 who reported that half of the respondents had a negative attitude towards ODS.[17] Concerning the educational program about ODS in this study, there was a significant increase in total knowledge score after the implementation of the educational program (9.4 ± 4.97 to 27.93 ± 4.4, $p < 0.001$). This is the first study that shows the effect of the implementation of an education program on the improvement of knowledge of ODS.

CONCLUSION AND RECOMMENDATIONS

Most of the study participants had a positive attitude towards ODS. Knowledge of ODS among pregnant women was influenced by socio-demographic factors such as age, education, residence, and family size. In addition, Knowledge of ODS was influenced by antenatal and obstetric risk factors such as parity, number of antenatal visits, history of abortion or disease, and previous exposure to ODS. The overall knowledge of ODS among pregnant women was improved after the implementation of the educational program.

Accordingly, the present study recommended the following:

- Health care providers should educate the women about ODS during their antenatal visits as they are the primary source of women's knowledge.
- Health education programs should be implemented to increase women's awareness of ODS.
- Health education materials as brochures and posters about ODS should be available in all antenatal clinics.
- Further studies are needed using large samples to assess women's awareness of ODS.

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CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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