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ORIGINAL PAPER

Knowledge, attitudes and practices regarding obstetric danger signs among Jordanian pregnant women attending antenatal clinic in Jordan

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Abstract

Aim: To investigate the knowledge, attitudes and practices regarding obstetric danger signs among pregnant women attending antenatal clinics in Jordan. *Design:* A descriptive cross-sectional. *Methods:* A convenience sample of 352 pregnant women who attended five antenatal clinics at Al-Karak Governorate in southeast Jordan was recruited. Data were collected using self-reported questionnaire and analyzed using descriptive statistics and inferential statistics. *Results:* The study findings revealed that (59.1%) of the participants had an inadequate knowledge of obstetric danger signs during pregnancy. In addition, the findings showed that the participants had a positive attitude towards obstetric danger signs. Furthermore, the findings showed that (45.7%) of the participants sought medical care when they experienced obstetric danger signs during pregnancy. The most significant factors affecting the level of knowledge were: age, participant's occupation and the history of stillbirth. *Conclusion:* The study findings demonstrated that the participants had inadequate knowledge and positive attitudes toward obstetric danger signs during pregnancy. Effective educational programs and other awareness interventions are needed to enhance awareness of obstetric danger signs during pregnancy.

Keywords: antenatal care, attitudes, danger signs, Jordan, knowledge, practices, pregnancy.

Introduction

Pregnancy is considered as a period of normal changes and adaptation that leads to physiological and psychological changes for pregnant women (Sangal et al., 2012). However, pregnancy may be complicated by many health problems that can be life threatening to the mother and the fetus (Demissie et al., 2015). Pregnancy related complications were among the highest killers in women of reproductive age in developing countries (Abiyot et al., 2014; World Health Organization, 2019). The major factors relating to the maternal mortality rate were delay in seeking health care and the low awareness of danger signs during the pregnancy (Okour et al., 2012a). The lack of knowledge about obstetric danger signs during pregnancy, linked with the delay in the decision making regarding seeking care may lead to further complications, and even maternal death (Bililign & Mulatu, 2017). Many studies have also shown inadequate hospital care and continuous delays in providing health care provided at different levels are the reasons behind the increase in the maternal mortality rates (Okour et al., 2012b; Pembe et al., 2010). However, most maternal morbidity and mortality causes can be prevented by proper access to maternity care, adequate obstetric care and early prediction of the problems (Workineh et al., 2014). During pregnancy, women may experience signs and symptoms, which may indicate danger signs and symptoms. Specifically, danger signs during pregnancy were defined as "the warning signs that may occur during pregnancy as a wrong or unusual event, which may have an effect on mothers and their babies" (Solomon et al., 2015). The most common pregnancy obstetric danger signs are bleeding from the vagina, vaginal leakage of fluid, severe abdominal pain, severe back pain, pelvic pressure, continuous nausea and vomiting (Sangal et al., 2012). Other danger signs which may occur during pregnancy include blurred vision, severe headache, edema of the ankles, hands, and face, bad smell of vaginal discharge, pain or burning sensation during urination, hyperthermia, and a decrease or absence of fetal movements (Demissie et al., 2015).

Antenatal care services play a significant role in providing pregnant women with adequate

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information about obstetric danger signs to achieve a safe pregnancy period for mothers and their babies (Udofia et al., 2013). Prevention of obstetric danger signs and improving healthcare services for pregnant women are ongoing challenges for midwives and other healthcare providers in Jordan and globally and enhancing knowledge and awareness about the obstetric danger signs during pregnancy is an important step in obstetric care (Okour et al., 2012b). Addressing knowledge, attitudes and practices regarding obstetric danger signs among pregnant women and gaining a better understanding of the factors that may improve knowledge, attitudes and practices regarding obstetric danger signs are of paramount importance.

Studies about current knowledge, attitudes and practices of obstetric danger signs among pregnant women in Jordan, and their relationships with other factors, such as demographic and clinical obstetric factors, can help to identify women who are at high risk of experiencing obstetric danger signs during pregnancy. As a matter of fact, identifying knowledge, attitudes and practices regarding obstetric danger signs during pregnancy can assist nurse midwives and other healthcare providers in planning and developing interventions and educational programs that enhance awareness of obstetric danger signs during pregnancy. To the researchers' knowledge, studies about knowledge, attitudes and practices regarding obstetric danger signs during pregnancy among pregnant women in Jordan are limited (Okour et al., 2012a).

Aim

The aim of this study was to investigate the knowledge, attitudes and practices regarding obstetric danger signs among pregnant women attending antenatal clinics in Al-Karak Governorate in Jordan.

Methods

Design

A descriptive, cross-sectional design was used in this study.

Sample

Participants were conveniently recruited from five antenatal clinics representing the three health sectors in Jordan (public, military, and private). The accessible population was pregnant women attended antenatal clinics in the south region of Jordan. The inclusion criteria were pregnant women of child bearing age, ranging from 15 to 49 years, who had a gestational period of at least 16 weeks for primigravida, multigravida in any gestational age, mentally and physically capable of completing the questionnaire, and able to read and write in the Arabic language. The exclusion criteria were pregnant women who were critically or mentally disabled and pregnant women who were health care providers.

Data collection

The study utilized a self-reported questionnaire which consisted of five sections. The first section contained the demographic data, which included: age, marital status, mother's occupation, family monthly income, husband's occupation, educational level of the mother, and educational level of the husband. The second section consisted of the clinical obstetric data which included: gravidity, parity, the number of babies born alive, the number of stillbirths, the number of living children, and the decision-maker for giving birth. The third section evaluated the participants' knowledge of obstetric danger signs during pregnancy. This section was adapted from the survey tool (prototype safe motherhood questionnaire), which was developed by Johns Hopkins program for international education in gynecology and obstetrics (Johns Hopkins Program for International Education in Gynecology and Obstetric, 2004). This tool consists of 12 items with a yes and no answer format. The total score ranged from 0–12. The following grading criteria for the total score were used (9–12 "good knowledge", 5–8 "fair knowledge", 0–4 "poor knowledge"). The fourth section assessed the participants' attitudes toward obstetric danger signs during pregnancy. This section was developed by the researchers based on previous studies (Nurgi, 2014; Sufiyan et al., 2016), and on suggestions provided by an expert panel that specialized in maternal and child health nursing. The face validity and the content validity were checked by an expert panel that consisted of three PhD holders, who were specialized in maternal and child health nursing. The attitudes' questionnaire was composed of 11 items on a 4-point Likert scale, with the options of "strongly disagree" (1), "disagree" (2), "agree" (3), and "strongly agree" (4). The total attitude questionnaire score, which ranged from 11 to 44, was obtained by adding the scores of all items. These scores were used as an index of attitudes towards obstetric danger signs during pregnancy with a higher score indicating positive attitudes towards obstetric danger signs during pregnancy. The following grading criteria for the total score were used (11–22 = "negative attitudes"; 22.1–33 = "medium attitudes"; 33.1–44 = "positive attitudes"). The last

section evaluated participants' practices towards obstetric danger signs during pregnancy. This section was developed by the researchers based on the survey tool (prototype safe motherhood questionnaire), which was developed by Johns Hopkins Program for International Education in Gynecology and Obstetric (2004). It includes four questions: "What are danger signs experienced by the participants during pregnancy?", "What pregnant women practice when danger sign occurred?", "Who decides what to do when danger signs occurred?" and "What are the reasons for seeking help?". The study instruments were developed first in the English language then were translated to Arabic language. A panel of three PhD holders who were specialized in maternal and child health nursing and two official translators who were competent in both Arabic and English languages were asked to translate and back-translate the questionnaires. In this study the Cronbach's alpha for the knowledge questionnaire was 0.80 and for the attitude questionnaire was 0.65. Data were collected after obtaining ethical approval from the Ethics and Research Committees at Mutah University and selected antenatal clinics. Participants who met the inclusion criteria were approached by the researcher in antenatal clinics and were invited to take part in the study. Participants were given brief information about the study aims, benefits, risks, the right to refuse participation, and the right to withdraw from the study at any time. They were assured that their information would be completely anonymous. The questionnaire was distributed by the researcher in the waiting area of antenatal clinics and participants were asked to sign a consent form. The researcher was available during the data collection period to answer any questions and queries related to study; participants were then asked to complete the questionnaires and to return them back to the researcher. Data collection took place over a period of three months, between May 2017 and July 2017.

Data analysis

Data were analyzed by using the SPSS (version 22) software using both descriptive and inferential statistics. The descriptive statistics were used to describe the demographic and clinical obstetric characteristics of the sample. Independent sample t-tests, analysis of variance (ANOVA) and person correlation were performed to examine significant differences and relationships among the study variables.

Results

From the 365 distributed questionnaires, 352 completed questionnaires were returned and included in the analysis, giving a response rate of 96.4%. The demographic and clinical obstetric characteristics of the study sample were displayed in Table 1. The mean age of study participants was 29 years (SD = 5.6; range = 18–40 years). More than half of the participants (57.4%) had completed diploma level and above, and two-thirds of the study sample (64.8%) were unemployed. The results revealed that more than half of the sample (51.7%) was pregnant for the first or second time, and two-thirds (65.1%) had 0–2 deliveries. The analysis showed that (71.3%) of the participants reported that they had heard about obstetric danger signs during pregnancy. It was noted that only 31.3% of the participants reported that the source of information about obstetric danger signs during pregnancy was from a healthcare provider, and (33.6%) reported that the source of information about obstetric danger signs during pregnancy was the media, as shown in Table 1.

The results of the study revealed that the participants had inadequate knowledge about obstetric danger signs. The participants' mean score in the knowledge test was 4.2 out of 12 (SD = 3). According to the grading criteria ("poor" 0–4; "fair" 5–8; "good" 9–12), (59.1%) and (30.7%) of the participants were considered to have "poor" "fair" knowledge about obstetric danger signs, respectively, as shown in Table 2. The highest correct knowledge percentage (76.1%) was for the item, "Bleeding at any time during pregnancy" and the lowest correct knowledge percentage (18.5%) was for the item, "Persistent vomiting especially from the fourth month of pregnancy" (Table 2).

The study findings showed that the mean score of attitudes towards obstetric danger signs was 33.9 out of 44 (SD = 4.0). According to the grading criteria of attitudes questionnaire scores (11–22 = negative attitudes; 22.1–33 = medium attitudes; 33.1–44 = positive attitudes), participants had positive attitudes towards pregnancy obstetric danger signs. The highest attitudes score (mean = 3.51; SD = 0.73) was for the item: "To know about obstetric danger signs is important because women will seek medical care" and the lowest attitudes score (mean = 2.41; SD = 0.92) was for the item: "A woman can prevent danger signs during pregnancy" (Table 3).

The results showed that (43.8%) of the study participants did not experience any obstetric danger signs during pregnancy. The highest reported obstetric danger sign experienced by the participants

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Table 1 Sociodemographic and clinical obstetric characteristics of study sample (n = 352)

Variable		n (%)	mean (SD)
Age	18–25 year	108 (30.7)	29 (5.6)
	26–32 year	131 (37.2)	
	33–40 year	113 (32.1)	
Educational level of mother	secondary and less	150 (42.5)	
	diploma and above	202 (57.5)	
Educational level of husband	secondary and less	221 (62.8)	
	diploma and above	131 (37.2)	
Mother occupation	employed	124 (35.2)	
	unemployed	228 (64.8)	
Gravidity	1–2	182 (51.7)	
	3–6	149 (42.3)	
	7–9	21 (6.0)	
Parity	0–2	229 (65.1)	
	3–6	113 (32.1)	
	7–9	10 (2.8)	
History of stillbirth[a]	no history	235 (66.8)	
	previous history	117 (33.2)	
Hearing obstetric danger signs during pregnancy	no	101 (28.7)	
	yes	251 (71.3)	
Source of information about obstetric danger signs during pregnancy	health care providers	110 (31.3)	
	relatives	27 (7.7)	
	friends	39 (11.1)	
	social media	118 (33.6)	
	health care provider and social media	58 (16.3)	

[a]*The birth of baby after 20 gestational weeks and 1 day or weighing 350 g, that does not show any signs of life. SD – standard deviation*

Table 2 Knowledge percentage of participants and experience percentage of participants with correct responses on each item of the knowledge test (n = 352)

Items	Correct knowledge response (%)	Experience percentage (%)
Bleeding at any time of pregnancy	76.1	25.0
Absent or decreased fetal movements	47.4	8.8
Persistent backache	44.6	20.7
Swelling of the Body	34.9	10.5
Unusual abdominal pain	33.0	8.0
Feeling very tired	31.0	20.5
Pain / burning on urination	29.8	11.6
Foul-smelling vaginal discharge	29.3	15.6
Fever	28.7	5.7
Persistent headache or blurred vision	24.1	11.1
Leaking of fluid from the birth canal	23.0	4.3
Persistent vomiting especially from the fourth month of pregnancy	18.5	7.7

was bleeding at any time of pregnancy (25%). Whereas, the lowest reported obstetric danger sign experienced was leaking of fluid from the birth canal (4.3%) Table 2. Four questions were used to evaluatethe participants' practices when they experienced obstetric danger signs during their pregnancy. The study findings revealed that less than half of the study sample (46.0%) sought medical care, (9.1%) used home remedies, less than half (45.7%) reported that they would go to the hospital and (5.7%) reported that they did not know what they would do if obstetric danger signs occur during pregnancy. Also, the findings showed that more than half of the participants (54.3%) identified themselves as being responsible for making the decision regarding what to do if obstetric danger signs occurred during pregnancy, and 75.3% of the study sample reported that the reason to seek help if obstetric danger signs occurred was to protect their health and their babies.

Table 4 shows the differences in knowledge scores of obstetric danger signs during pregnancy among subgroups of demographics and clinical obstetric variables. The analysis revealed that there were significant differences found that were related to age groups ($f = 4.7$; $p = 0.009$), occupation groups

(t = 2.6; p = 0.010) and a history of stillbirth (t = 2.0; p = 0.03). The results revealed that the 26 to 32 age group had significantly higher knowledge scores (mean = 4.8; SD = 3.4) than other age groups, and participants who were employed had significantly higher scores (mean = 4.7; SD = 3.2) than those who were unemployed (mean = 3.8; SD = 2.9), while participants with a history of stillbirth had significantly higher scores (mean = 4.6; SD = 3.1) than participants without a history of stillbirth (mean = 3.9; SD = 2.9).

The analysis revealed that there were significant differences in the participants' attitude total scores related to the educational level of the mother, history of stillbirth, number of pregnancies and number of deliveries (p > 0.05). The results showed that the participants with a diploma or above educational level had significantly higher scores (mean = 34.8; SD = 3.9) than participants with a secondary or lower educational level (mean = 32.7; SD = 3.6).

The results also revealed that the participants without a history of stillbirth had significantly higher scores (mean = 34.2; SD = 4.1) than participants with a history of stillbirth (mean = 33.3; SD = 3.7). Moreover, results showed that the participants with 1–2 number of pregnancies had significantly higher scores (mean = 34.5; SD = 4.2) than other groups. Regarding parity, the results revealed that the participants with 0–2 deliveries had significantly higher scores (mean = 34.4; SD = 4.0) than other groups Table 5.

The study's findings showed that there was a statistically significant positive relationship between the knowledge scores and attitudes' scores (r = 0.256; p = 0.000).

Table 3 Participants attitudes towards obstetric danger signs test (n = 352)

Item	mean[a]	SD
To know about obstetric danger signs is important because women will seek medical care	3.51	0.73
I think early management of danger signs reduce the risk of pregnancy and delivery	3.45	0.76
Mothers who develop obstetric danger signs should seek medical advice.	3.39	0.91
To know about obstetric danger signs is important because the danger signs will not go away by their own.	3.36	0.74
Men's knowledge about obstetric danger signs is important because men will influence women's health care decision making.	3.20	0.86
Danger signs may not affect mother and fetus health conditions	3.11	0.99
It is not important for the husband to know obstetric danger signs during pregnancy.	2.97	1.02
Knowledge of danger signs will effect on men's preparedness for birth	2.96	0.98
It is not important for women to know about obstetric danger signs during pregnancy	2.87	1.10
Mothers who develop obstetric danger signs should seek help from other older women	2.69	0.92
A woman can prevent danger signs during pregnancy	2.41	0.92

[a]score ranged from 1–4

Table 4 Differences in knowledge scores regarding obstetric danger signs between subgroups of sociodemographic and clinical obstetric characteristics (n = 352)

Variable		mean	SD	Test analysis	p-value
Age	18–25	3.6	2.9		
	26–32	4.8	3.4	f = 4.7	0.009*
	33–40	4.0	2.5		
Educational level of mother	secondary or less	3.8	3.0	t = 1.6	0.10**
	diploma or above	4.4	3.0		
Educational level of husband	secondary or less	4.1	3.0	t = 0.5	0.558**
	diploma or above	4.3	3.0		
Mother occupation	employed	4.7	3.2	t = 2.6	0.010**
	unemployed	3.8	2.9		
Gravidity	1–2	3.9	3.0		
	3–6	4.3	3.0	f = 1.8	0.15*
	7–9	5.0	3.4		
Parity	0–2	4.1	3.1		
	3–6	4.2	2.8	f = 1.4	0.23*
	7–9	5.8	3.6		
History of stillbirth:	without history	3.9	2.9	t = 2.0	0.03**
	with history	4.6	3.1		

**p-value by ANOVA test analysis; **p-value by t-test analysis; SD – standard deviation*

Table 5 Differences in attitudes towards obstetric danger signs scores between subgroups of sociodemographic and clinical obstetric characteristics (n = 352)

Variable		mean	SD	Test analysis	p-value
Age	18–25	33.8	4.2		
	26–32	34.5	3.8	f = 2.6	0.069*
	33–40	33.3	3.8		
Educational level of mother	secondary or less	32.7	3.6	t = 5.2	0.00**
	diploma or above	34.8	3.9		
Educational level of husband	secondary or less	33.7	4.0	t = 1.5	0.12**
	diploma or above	34.3	3.8		
Mother occupation	employed	34.4	3.9	t = 1.6	0.09**
	unemployed	33.7	4.0		
Gravidity	1–2	34.5	4.2		
	3–6	33.4	3.5	f = 4.8	0.008*
	7–9	32.6	3.8		
Parity	0–2	34.4	4.0		
	3–6	32.9	3.6	f = 5.7	0.003*
	7–9	33.2	3.3		
History of stillbirth	without history	34.2	4.1	t = 1.9	0.05**
	with history	33.3	3.7		

**p-value by ANOVA test analysis, **p-value by t-test analysis; SD – standard deviation*

Discussion

This study aimed to examine knowledge, attitudes and practices regarding obstetric danger signs in a sample of pregnant women attending antenatal clinics in Jordan. It was interesting to note that the findings of this study revealed that most of the participants had an inadequate knowledge regarding knowledge of obstetric danger signs during pregnancy and more than half of participants (59%) were considered to have poor knowledge about obstetric danger signs during pregnancy. This finding is consistent with the findings of previous studies, which reported a poor level of knowledge regarding obstetric danger signs (Demissie et al., 2015; Mengesha & Taye, 2015). The inadequate knowledge regarding obstetric danger signs during pregnancy may be related to the lack of a proper health education in the study sample, the ineffective role of antenatal visits, and the fact that pregnant women had not received an optimal care and adequate information during antenatal visits (Mandal et al., 2015). Consistent with previous studies findings (Abiyot et al., 2014; Mbalinda et al., 2014; Mengesha & Taye, 2015; Okour et al., 2012a; Solomon et al., 2015), the current study findings indicated that the most common obstetric danger sign reported by participants was "Bleeding at any time during pregnancy". Conversely, the lowest common sign reported by participants in the current study was "Persistent vomiting, especially from the fourth month of pregnancy". One possible explanation of this finding is that this sample of Jordanian pregnant women believed that vomiting was a normal sign during pregnancy. In agreement with previous study results, (Okour et al., 2012a), indicated that 71% of the participants had heard about obstetric danger signs during pregnancy. This implies that awareness about obstetric danger signs during pregnancy should be enhanced during antenatal clinic visits. It is noteworthy that only 31% of the study participants reported that the source of information about obstetric danger signs during pregnancy was healthcare providers. This finding is consistent with study findings which indicated that 27% of the study participants reported that the source of information about obstetric danger signs during pregnancy was the health care providers (Okour et al., 2012b). This finding suggests that the role of healthcare providers in the health education process during antenatal visits should be reinforced, and further research is needed to investigate the efficacy of educational interventions provided by healthcare providers to pregnant women during pregnancy. It was noted that one-third of the study sample (34%) reported that they had received their information about obstetric danger signs from social media. This finding is considered low when compared with the results reported by (Okour et al., 2012a), which indicated that 73% of the study sample had got information about obstetric danger signs from media. This finding implies the importance of using and integrating social media into health education programs for pregnant women. Also, it suggests the need for providing accurate and updated information through these media.

The findings of the current study indicated that there

are significant differences in the knowledge scores related to the participants' age. Women who were aged between 26 and 32 years old were more knowledgeable regarding obstetric danger signs during pregnancy, a finding that is consistent with previous studies findings (Mengesha & Taye, 2015; Rashad & Essa, 2010; Workineh et al., 2014), but differs from other studies findings (Okour et al., 2012a; Sangal et al., 2012). However, the present study showed that there were no significant differences in the participants' knowledge scores with respect to the educational level of the mother and the educational level of the husband. This finding is in contrast with the finding reported by (Okour et al., 2012a), which indicated that there were significant differences in the participants' knowledge scores with respect to the educational level of the mother and the educational level of the husbands. This result may suggest that the level of education of the pregnant woman and her husband did not relate to the knowledge levels regarding obstetric danger signs during pregnancy. The present study revealed that women with a history of stillbirth had more knowledge about obstetric danger signs than women without a history of stillbirth. This finding is in contrast with (Doctor et al., 2013), which reported that the women with a history of stillbirth were not knowledgeable about obstetric danger signs during pregnancy. No previous studies were found that reported the same result regarding the history of stillbirth. This finding may be explained by the fact that women with a history of stillbirth and other complications during pregnancy are more motivated to know about obstetric danger signs. In addition, the mother may learn about obstetric danger signs from her own experiences. Therefore, experience may lead to early seeking of medical care if obstetric danger signs occur, due to fear from the recurrence of the same complications. The present study indicated that pregnant women reported positive attitudes towards pregnancy obstetric danger signs. The total mean of attitudes scores was 34 out of 44. This result, however, is inconsistent with a previous study finding which found that the majority of the study sample (87%) had negative attitudes towards obstetric danger signs during pregnancy (Sufiyan et al., 2016).

The positive attitudes reported in the current study may suggest that pregnant women in this sample were motivated to learn more information about obstetric danger signs that may occur during pregnancy. Less than half of the study participants (43%) did not experience any obstetric danger signs during pregnancy, which differs from other studies that reported that (79%) of the participants did not experience any obstetric danger signs during pregnancy (Okour et al., 2012a). On the other hand, the lowest reported obstetric danger sign experienced by the participants in this study was leaking of fluid from the birth canal. This finding again differs from those reported by (Sangal et al., 2012), where the lowest experienced sign was urinary tract infection.

Reviewing studies on the factors associated with attitudes towards obstetric danger signs during pregnancy has shown that such studies are scarce. The findings of the current study indicated that there are significant differences in attitudes towards obstetric danger signs, which are related to the educational level of the mother. The women with a diploma and above had more positive attitudes towards obstetric danger signs. The findings also indicated that the number of pregnancies and the number of deliveries were significantly associated with attitudes towards obstetric danger signs. It is noteworthy that women with a high number of pregnancies and deliveries had more positive attitudes towards obstetric danger signs. These positive attitudes may be established and enhanced from previous experiences of danger signs. The study findings show the importance of developing interventions that need to be used during antenatal visits to enhance and reinforce positive attitudes towards danger signs during pregnancy, and to make pregnant women more able to treat and manage danger signs when they occur during pregnancy. When evaluating the relationship between knowledge and attitudes, the variables were found to be significantly associated, suggesting that knowledge of, and attitudes towards danger signs influence each other. These findings imply that pregnant women with a high level of knowledge regarding obstetric danger signs during pregnancy have positive attitudes towards danger signs based on acquired knowledge and information regarding obstetric danger signs during pregnancy. Educational programs play an important and effective role in enhancing the level of knowledge, practices and attitudes, especially in primipara mothers. Teaching programs may also motivate the primipara mothers to improve their knowledge about danger signs during pregnancy, and enhance positive attitudes and practices (Kavitha et al., 2012). These planned health education programs may be provided through hospital-based antenatal clinics and community based educational strategies (Nurgi, 2014). The findings of the present study stress the importance of incorporating health education interventions to enhance pregnant women's awareness of obstetric danger signs and other concerns during the pregnancy period. These educational interventions should involve pregnant

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women and their family, so that the family can provide assistance when danger signs and other problems occur during pregnancy. Health policy should focus on expanding health awareness about birth preparedness and obstetric danger signs in pregnancy among women, and should be included in all hospitals and maternal and child health centers in urban and rural locations. This awareness could be enhanced by television and radio programs about obstetric danger signs and birth preparedness. Policymakers should design and establish new methods of assessment and counseling services for pregnant women who attend antenatal clinics based on updated international recommendations and guidelines. Furthermore, the hospital managers should be responsible for implementing in-service training and education programs regarding obstetric danger signs for nurses who provide antenatal care. Further research is needed to investigate the husband, family, and community awareness of obstetric danger signs during pregnancy and future research is recommended to investigate the effects of the educational programs related to obstetric danger signs during pregnancy. It is also recommended that variation needs to be considered among the participants, so that a larger and a more representative sample is included in future studies.

Limitation of study

The study was confined to a sample of pregnant women drawn from the South of Jordan. Also, the sample was selected by a convenience sampling method which limits the ability to generalize its results to other populations. The study used a cross-sectional design which precluded definitive causal relationships between the study variables. Therefore, for replication of this study, a larger sample, multiple settings and the use of a combined approach of self-reported and interview methods for data collection are recommended.

Conclusion

The results of this study demonstrated that participants had an inadequate knowledge and had positive attitudes toward obstetric danger signs during pregnancy. The results of the current study recommended that actions are needed to improve the quality of antenatal care services, integrate and enhance the role of health education interventions on regular care of pregnant women. The researcher suggested that there is a need to establish effective educational programs to enhance the awareness related to obstetric danger signs during pregnancy. In addition, the study results highlighted the importance of involving family members of the pregnant woman in taking care of pregnant women during pregnancy.

Ethical aspects and conflict of interest

After ethical committees had approved the study proposal, all eligible participants were invited to complete the questionnaires. All participants in the study were informed about the study, their written informed consents were obtained, and they were also informed that they could leave the study at any time. Issues of anonymity and confidentiality were addressed. There were no conflicts of interest in the current study.

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Author contributions

The concept and study design (BMA, OAA, AMA), data analysis and interpretations (BMA, OAA, AMA), processing the draft of the manuscript (BMA, OAA, AMA), critical revision of the manuscript (BMA, OAA, AMA), final approval of the manuscript (BMA, OAA, AMA).

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