



## Knowledge of Pregnant Women About Obstetric Danger Signs of Pregnancy: Experience of a Maternity Hospital in Iraq

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### Abstract

**Background:** According to the World Health Organization, 287,000 women die yearly from pregnancy and delivery problems; 99% are in developing countries. Early identification of obstetric danger signs by the mother can result in earlier identification of obstetric emergencies and, thus, reduced maternal morbidities. This study aimed to assess the level of awareness of obstetric danger signs and the factors affecting this awareness among pregnant women attending a maternity hospital in Anbar province, Iraq.

**Methods:** In this cross-sectional study, data was collected using a questionnaire filled through direct interviews with the women. It consists of three parts: sociodemographic data, obstetric data, and obstetric danger signs. A woman was considered to have a good awareness of the main danger signs of pregnancy if she could mention at least two of the ten main danger signs of pregnancy spontaneously.

**Results:** The study included 352 pregnant women; about 80% (281) of the studied sample showed "Good" awareness of the main danger signs of pregnancy. The factors affecting awareness of obstetrical danger signs were educational status ( $P=0.001$ ), monthly income ( $P=0.028$ ), parity ( $P=0.032$ ), and gravidity ( $P=0.015$ ). Among danger signs of pregnancy, blurred vision and convulsion were the least identified.

**Conclusion:** Some pregnant women were unaware of obstetric danger signs. This can make them delayed in seeking care. Education of pregnant women attending antenatal care clinics on these danger signs should be standard practice.

**Keywords:** Pregnant Women; Awareness; Obstetric Danger Signs; Iraq

### Introduction

Pregnancy is a natural process and a significant social and medical event that causes a number of physiological and psychosocial changes that may be accompanied by certain warning symptoms and difficulties that can be fatal to the mother and/or baby [1]. The family, society, and healthcare system should treat pregnancy with great care and attention. Although delivery is a good anticipation for the majority of women, it may be difficult for others [2].

Every pregnant woman faces the potential of abrupt, unexpected problems connected to obstetric danger signs (ODS) that might

result in death or damage to the mother or the newborn and cannot be consistently predicted. Pregnancy is an important time to teach healthy habits and parenting skills. Inadequate care during this period disrupts a vital link in the care continuum, affecting both moms and newborns. As a result, ODS may result in obstetric issues such as growth-restricted fetuses, oligohydramnios, early rupture of membranes, preterm labor, and higher cesarean section rates [3]. Delay in seeking treatment is one of the major causes of maternal and newborn death, linked to a lack of understanding of obstetric danger signs. Pregnant women and their families must understand the warning signals of obstetric problems to react promptly to any emerging issues [4].

The World Health Organization (WHO) estimates that 287,000 women die each year from pregnancy and delivery problems, or 830 women die every day. Most of these (99%) occur in developing countries<sup>[5]</sup>. The WHO advises that women be educated about risk indicators before, during, and after delivery to enhance the early identification of abnormalities and minimize the time it takes to seek obstetric treatment<sup>[6]</sup>.

Antenatal care (ANC) is the care offered to pregnant women to have a safe pregnancy and a healthy infant. The primary purpose of ANC is to assist women in maintaining normal pregnancies by promoting health and illness prevention, as well as early diagnosis, recognition, and treatment of obstetric risks<sup>[2]</sup>. It is one of the fundamental components of maternal care on which mothers and newborns rely. As a result, ANC is an important method for improving mother and newborn health<sup>[7]</sup>. ANC serves as a foundation for critical healthcare functions such as health promotion, screening, diagnosis, and illness prevention. It has been shown that ANC can save lives by applying timely and suitable evidence-based strategies. Crucially, ANC allows women to interact with and assist their families and communities at a key point in their lives. ANC guidelines should deliver good communication on physiological, biological, behavioral, and sociocultural challenges, as well as appropriate support<sup>[8]</sup>.

High levels of maternal mortality can be reduced by providing quality maternity services, empowering women with knowledge of the danger signs of pregnancy, and promoting appropriate health-seeking perceptions. The objectives of this study were to assess the level of awareness of pregnant women attending Al Ramadi Hospital, Anbar governorate, towards the obstetric danger signs and find out the potential factors affecting the awareness of these signs.

### Subjects and Methods

- **Study design:** A cross-sectional design has been chosen for this study.
- **Study Place and Time:** The study was conducted in Al-Ramadi Teaching Hospital, AL-Anbar Governorate, Iraq, during the period from the 1<sup>st</sup> of December 2022 to the 28<sup>th</sup> of February 2023.
- **Study population and sampling technique:** A convenience sampling has been chosen where all pregnant ladies attending the outpatients' clinics at the time of data collection and who accepted to participate were included

- **Exclusion criteria:** Pregnant women who were severely ill or unable to communicate were excluded.
- **Data Collection Tool:** A questionnaire-based patient interview was employed as the data collection method. The questionnaire for this study is adapted from the 'Safe Motherhood questionnaire' as developed by Jhpiego's Maternal and Neonatal Health Program and other similar studies<sup>[9-11]</sup>. It consists of three parts: sociodemographic data, obstetric data, and obstetric danger signs. A woman was considered to have a good awareness of the main danger signs of pregnancy if she could mention at least two of the ten main danger signs of pregnancy spontaneously.
- **Data entry and analysis:** Data entry was done using Microsoft Excel 2019. Data was recorded into different quantitative and qualitative variables for the purpose of analysis. Analysis was done using a statistical package for social sciences (SPSS version 26). Data were summarized using measures of frequency (mean) and dispersion (standard deviation) and tables. Fischer's exact test was used to test for the association between categorical variables. Logistic regression was conducted to identify determinants of knowledge of pregnancy danger signs. Variables with  $p < 0.1$  in the bivariate analysis were selected as candidate variables for logistic regression analysis to control the effect of confounders. Adjusted odds ratios (AORs) with their 95% confidence intervals (CIs) and  $p < 0.05$  were considered to have a significant association between the outcome and the independent variables. A P-value of less than or equal to 0.05 was considered statistically significant.
- **Participant consent:** Verbal consent was obtained from all participants before data collection.
- **Approval and official permission:** Ethical approval was granted by the Training and Human Resources Development Center, Ministry of Health. Official approval to meet the patients was granted from by the hospital management.

### Results

#### Sociodemographic characteristics of the studied sample

The total number of the studied sample was 352. The age distribution ranged from 14-45 years, with a mean of 25.1 ( $\pm$  5.7 SD) years. Most of the studied sample was in the age group 20-29 years (68.2%); half resided in rural areas (50.3%), 84.1% were housewives, 43.2% had primary school education, and around half (47.2%) were considered their financial status as "satisfied to some extent" (Table 1).

**Table 1:** Sociodemographic characteristics of the studied sample.

Sociodemographic characteristics	No (352)	%
Age		
<20 years	44	12.5
20-29 years	240	68.2
30-39 years	58	16.5
≥40 years	10	2.8
Residence		
Urban	175	49.7
Rural	177	50.3
Occupation		
Employed	36	10.2
Housewife	296	84.1
Student	20	5.7
Educational status		
Illiterate	71	20.2
Primary school	152	43.2
Secondary school	82	23.3
College and above	47	13.4
Monthly income		
Satisfied	84	23.9
Satisfied to some extent	166	47.2
Unsatisfied	102	29.0

**Obstetric characteristics of the studied sample**

Around half of the studied sample was <20 years old at the onset of their first pregnancy (51.4%), 36.6% were multiparous, and 31.5% were nulliparous. 74.1% were multigravida, 72.2% had no history of abortion, and 78.7% had no history of complications during pregnancy. Regarding compliance with antenatal care visits, 70.7% were not compliers. Concerning gestational age, 231 (65.6%) were in their 3<sup>rd</sup> trimester. As for 241 women who had previous deliveries, 67.6% were delivered by normal vaginal delivery, and 89.2% were delivered at the hospital (Table 2).

**Identification of danger signs during Pregnancy**

Regarding the identification of pregnancy danger signs, vaginal bleeding was the most commonly identified main danger sign (73.6%), followed by severe abdominal pain (72.2%), absent or de-

**Table 2:** Obstetric characteristics of the studied sample.

Obstetric characteristics	No (352)	%
Age of first pregnancy		
<20 years	181	51.4
20-29 years	156	44.3
30-39 years	14	4.0
≥40 years	1	.3
Parity		
Nulliparous	111	31.5
Primiparous	87	24.7
Multiparous	129	36.6
Grand multiparous	25	7.1
Gravidity		
Primigravida	91	25.9
Multigravida	261	74.1
Abortion		
Yes	98	27.8
No	254	72.2
Trimester of the current pregnancy		
1st trimester	61	17.3
2nd trimester	60	17.0
3rd trimester	231	65.6
History of complications during pregnancy		
No	277	78.7
Yes	75	21.3
Compliance with ANC visits		
Yes	103	29.3
No	249	70.7
Type of last delivery (Total = 241)		
Normal	163	67.6
C/S	78	32.4
Place of delivery (Total = 241)		
Home	26	10.8
Hospital	215	89.2

creased fetal movement (29.0%), leakage of amniotic fluid without labor (28.7%), severe headache (19.3%), persistent nausea and vomiting (11.9%), high fever (8.5%), body swelling (7.7%), and blurred vision (4.3%), while “convulsion” was identified by none; as illustrated Table (3).

**Table 3:** Identification of danger signs during pregnancy.

Danger sign	Not identified (%)	Identified (%)
Vaginal bleeding	93 (26.4%)	259 (73.6%)
Persistent nausea and vomiting	310 (88.1%)	42 (11.9%)
Swelling of body	325 (92.3%)	27 (7.7%)
Blurred vision	337 (95.7%)	15 (4.3%)
Severe headache	284 (80.7%)	68 (19.3%)
Absent or decreased fetal movement	250 (71.0%)	102 (29.0%)
Severe abdominal pain	98 (27.8%)	254 (72.2%)
Leakage of amniotic fluid without labor	251 (71.3%)	101 (28.7%)
High fever	322 (91.5%)	30 (8.5%)
Convulsion	352 (100.0%)	0 (0.0%)

**Awareness of danger signs**

Among the studied sample, 281 (79.8%) showed “Good” awareness of the main danger signs of pregnancy and “Poor” in 71 (20.2%) women.

Association between awareness of the main danger signs of pregnancy and certain sociodemographic and obstetric characteristics. A statistically significant association was detected between awareness of the main danger signs of pregnancy and educational status (P=0.001), monthly income (P=0.028), parity (P=0.032), and gravidity (P=0.015) as illustrated in Table (4).

Table (5) illustrates multivariate logistic regression analysis, which included variables that showed a (p-value < 0.1) in univariate analysis. In this model, educational level was the only variable with a significant association with good knowledge.

**Table 4:** Association between awareness of the main danger signs of pregnancy and certain sociodemographic and obstetric characteristics.

Sociodemographic and obstetric characteristics	Awareness of the main danger signs of pregnancy		P value
	Poor	Good	
Age			
<20 years	13 (29.5%)	31 (70.5%)	0.371
20-29 years	45 (18.8%)	195 (81.3%)	
30-39 years	12 (20.7%)	46 (79.3%)	
≥40 years	1 (10.0%)	9 (90.0%)	
Residence			
Urban	30 (17.1%)	145 (82.9%)	0.184
Rural	41 (23.2%)	136 (76.8%)	
Educational status			
Illiterate	22 (31.0%)	49 (69.0%)	0.001
Primary school	37 (24.3%)	115 (75.7%)	
Secondary school	9 (11.0%)	73 (89.0%)	
College and above	3 (6.4%)	44 (93.6%)	
Occupational status			
Employed	4 (11.1%)	32 (88.9%)	0.063
Unemployed	66 (22.3%)	230 (77.7%)	
Student	1 (5.0%)	19 (95.0%)	
Monthly income			
Satisfied	19 (22.6%)	65 (77.4%)	0.028
Satisfied to some extent	24 (14.5%)	142 (85.5%)	
Unsatisfied	28 (27.5%)	74 (72.5%)	
Parity			
Nulliparous	31 (27.9%)	80 (72.1%)	0.032
Primiparous	10 (11.5%)	77 (88.5%)	
Multiparous	24 (18.6%)	105 (81.4%)	
Grand-multiparous	6 (24.0%)	19 (76.0%)	
Gravidity			
Primigravida	27 (29.7%)	64 (70.3%)	0.015
Multigravida	44 (16.9%)	217 (83.1%)	
History of abortion			
Yes	13 (13.3%)	85 (86.7%)	0.054
No	58 (22.8%)	196 (77.2%)	

Trimester			
First trimester	15 (24.6%)	46 (75.4%)	0.631
Second trimester	11 (18.3%)	49 (81.7%)	
Third trimester	45 (19.5%)	186 (80.5%)	
Compliance with ANC care visits			
Yes	23 (22.3%)	80 (77.7%)	0.560
No	48 (19.3%)	201 (80.7%)	
Type of previous delivery (N=241)			
Normal	27 (16.6%)	136 (83.4%)	1.000
Caesarian section	13 (16.7%)	65 (83.3%)	
Place of previous delivery (N=241)			
Home	4 (15.4%)	22 (84.6%)	1.000
Hospital	36 (16.7%)	179 (83.3%)	

**Table 5:** Logistic regression analysis of factors associated with good knowledge of danger signs.

Variable	Odds ratio	95% CI		P value
		Lower	Upper	
Educational status				0.002
Illiterate	Ref.	Ref.	Ref.	Ref.
Primary school	1.596	0.819	3.110	0.169
Secondary school	5.242	1.959	14.026	0.001
College and above	13.027	2.042	83.090	0.007
Occupation				0.637
Student	Ref.	Ref.	Ref.	Ref.
Unemployed	0.319	0.026	3.938	0.319
Employed	0.576	0.064	5.215	0.576
Monthly income				0.092
Unsatisfied	Ref.	Ref.	Ref.	Ref.
Satisfied to some extent	0.888	0.415	1.901	0.888
Satisfied	1.800	.919	3.524	1.800
Parity category				0.387
Nulliparous	Ref.	Ref.	Ref.	Ref.
Primiparous	3.676	.790	17.112	0.097
Multiparous	2.216	.552	8.889	0.262
Grand multiparous	2.183	.433	11.021	0.344
Gravidity				0.881
Primigravida	Ref.	Ref.	Ref.	Ref.
Multigravida	1.122	.246	5.124	.881
History of previous abortion				0.115
No	Ref.	Ref.	Ref.	Ref.
Yes	1.971	0.847	4.588	0.115

### Discussion

The first step in getting a patient referred to the primary care provider at the right time is learning the warning signs of obstetric complications that might arise throughout pregnancy.

The current study revealed that about 80% of women had good knowledge about pregnancy danger signs. This proportion is considerably higher than those reported by other studies, such as those by Haleema et al. in India (54.7%), Hibstu et al. in Ethiopia (49.1%), Bolanko et al. in Ethiopia (47.7%), and Okour et al. in Jordan (46.3%) [12-15]. The current study’s findings of high-quality knowledge demonstrate the effectiveness of the Iraqi Ministry of Health’s healthcare program in the Al-Anbar Governorate. However, it is noteworthy to mention that the above studies (except Bolanko et al.) used stricter criteria to define good knowledge than our study (for example, the study by Okour et al. required that the participant mention three danger signs to categorize her knowledge as good). Whereas our study and Bolanko et al. required only two danger signs.

Most pregnant women enrolled in the current study had successfully identified vaginal bleeding and severe abdominal pain as signs of obstetric hazards in pregnancy. In contrast, most interviewed women failed to identify fever, body swelling, and blurred vision, and none identified convulsions. This finding is in concordance with the study by Bililign et al., who reported that vaginal bleeding was the most commonly identified sign (83.5%), followed by decreased fetal movement (38.1%) and leakage of amniotic fluid (35.6%). Body swelling, blurred vision, convulsion, and fever were the least identified danger signs [4]. The study by Nigusie et al. also reported that vaginal bleeding was identified by 81.6%, while convulsion was determined by only 10% [16]. Convulsion in pregnancy is directly related to eclampsia, a fatal condition. It is reasonable to assume that improving the knowledge of pregnant women regarding pregnancy-related seizures will lead to improvement in certain aspects, such as blood pressure monitoring and commitment to ANC.

The present study revealed that higher education predicted better awareness regarding obstetric danger signs. This finding is in concordance with Bililign et al., who reported that mothers having secondary or higher education levels were 3.6 and about five times more likely to be knowledgeable [4]. It is important to highlight that multivariate that educational level was the only factor associated

with good knowledge in multivariate analysis. This is not surprising, considering that women who have completed higher levels of education are more likely to be more informed. Women are better equipped to recognize the early warning signals of potential health problems and take preventative action when they have a higher level of health education.

In the current study, monthly income was also a predictor of better awareness. Similar findings were reported by Nigussie et al. and Shaheen et al.<sup>[16,17]</sup>. This is related to increasing household income and the family's economic status. As a result, women might get frequent contact with health institutions for ANC, delivery, and health information about obstetric danger signs.

An interesting finding of the current study is that higher experience with pregnancy, but not age, was a predictor of better knowledge. This concurs with Mwilike et al., who reported a strong relationship between pregnant experience and knowledge of the danger signs<sup>[18]</sup>. This is because women with more pregnancy experience tend to get more information.

The role of ANC should extend beyond the pregnant woman's health to her education. Notably, compliance with ANC visits was not associated with better awareness of pregnancy danger signs. Moreover, the Iraqi study by Zainab Al-Ali and Salma Kadhum in Hilla City found no difference in awareness levels between those with regular and irregular ANC visits<sup>[19]</sup>. This reflects a gap in the Iraqi health care system, which can lead to better awareness when corrected. The study by Valley et al. reported an eight-fold increase in pregnant women's awareness of pregnancy risks after receiving education during an ANC visit<sup>[20]</sup>. Moreover, the place of final delivery did not predict awareness among women with previous pregnancies. This is in discordance with Yunitasari et al., who reported that women who gave birth in a hospital or clinic were around six times more likely to recognize obstetric danger signs than those who gave birth at home<sup>[21]</sup>.

Based on the present study's findings, some pregnant women were unaware of the obstetric danger signs of pregnancy. This can make them likely to delay seeking care. Blurred vision and convulsion were the least identified among pregnancy danger signs. Education, monthly income, and pregnancy experience were predictors of better awareness. At the same time, antenatal care compliance and place of delivery were not associated with attention.

This study was conducted in a maternity hospital in one of the districts in Iraq using a convenience sampling. This may limit the generalizability of the results to the whole community of pregnant women.

Antenatal care can more efficiently inform expectant mothers of potential obstetrical risks. Development of brochures and instructional materials that can be disseminated to pregnant women and demonstrate these signs as part of educational instruction displayed on the clinics' TV. More emphasis should be paid to the signs frequently missed by the pregnant ladies. It is recommended to incorporate the mother health topics, including the danger signs, in the curriculum of secondary schools. Also, women's organizations and associations can play a pivotal role in disseminating knowledge of the mother's health, including the danger signs. More importantly, education of expectant mothers on obstetric danger signs should be standard practice during antenatal care visits.

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