AWARENESS OF OBSTETRIC DANGER SIGNS AND ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING OUTPATIENT DEPARTMENT OF HAYATABAD MEDICAL COMPLEX, PESHAWAR

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Abstract

Background

Maternal mortality continues to pose a grave challenge in Pakistan, especially in Khyber Pakhtunkhwa despite ongoing efforts. Timely recognition of obstetric danger signs is key to reducing such deaths, yet local data on awareness levels among pregnant women are lacking.

Objective:

This study evaluated awareness of obstetric danger signs and associated factors among pregnant women attending the outpatient department of Hayatabad Medical Complex, Peshawar.

Methods:

A cross sectional study was carried at HMC from April to December 2024. Using systematic random sampling, 427 pregnant women were enrolled. Data were collected through a structured, interviewer administered questionnaire in Urdu and Pashto, assessing socio-demographic factors, obstetric history, knowledge of danger signs, and sources of information. Awareness was graded as good, fair , or poor based on recall. Statistical analyses included chi-square tests and multivariable logistic regression to identify predictors of good awareness.

Results:

Only 19.2% of women demonstrated good awareness (≥ 4 recalled signs), while 38.4% could not name any danger sign. The most recognized signs were severe vaginal bleeding (42.2%) and heavy postpartum bleeding (26.5%), with poor recall for convulsions and foul smelling discharge. Higher education, four or more antenatal visits, urban residence, history of obstetric complications, and counseling by healthcare providers were independently associated with good awareness.

Conclusion:

Awareness of obstetric danger signs among pregnant women at HMC, Peshawar, is insufficient. Focused interventions especially educational strategies integrated into antenatal care are urgently needed to enhance recognition of life threatening complications and promote timely healthcare seeking, ultimately reducing maternal morbidity and mortality.

Keywords: Obstetric danger signs, Maternal mortality, Awareness, Antenatal care

INTRODUCTION

Mothers dying during pregnancy or delivery is still an all too prevalent tragedy in the world, particularly in underdeveloped nations. Preventable problems such as excessive bleeding, complications from high blood pressure, and infections continue to kill women and their babies considerably more frequently than they should in these situations [1]. Simple yet crucial, this is one of the most often disregarded causes of these deaths: many women and families fail to identify warning signals in time, which delays their choice to seek appropriate medical assistance [2,3]. The World Health Organization has stated unequivocally that the greater the likelihood of survival for both mother and child, the sooner these warning signs are identified and addressed, whether during pregnancy, labor, or following [1]. Obstetric danger signs can be thought of as nature's urgent alarms, signaling when something is going dangerously wrong. These warnings are grouped according to when they happen. During pregnancy, severe bleeding, swelling of the face or hands and sudden vision changes should never be ignored. In Labor, danger might show up as seizures, extremely long obstructed labor, or troubling delivering the placenta. After birth, heavy bleeding, persistent fever, or foul discharge can mean a life threatening infection [4,5].

Despite how crucial this knowledge is, countless studies from all over the world show that many pregnant women can name very few of these signs when asked. For instance, research in the Democratic Republic of Congo revealed that, on average, women could only mention one or two warning signs, and this number varied widely across different communities [6]. In the Indian state of Rajasthan, about half of the women going for antenatal checkups did not know enough about these danger signals. Notably, their education, number of pregnancies, and frequency of prenatal visits all played a role in their awareness levels [7]. A glance at south Asia paints a similar picture. In Bhutan, most pregnant women were considered to have "acceptable" knowledge, but when pressed, less than 5% could actually list the essential danger signs [3]. In Nepal's Chitwan region, only a quarter of women were aware of key obstetric warnings, pointing to a desperate need for better health education during routine checkups [8]. Even countries with active maternal health campaigns face these challenges. Reports from Tanzania and Libya indicate that women still struggle to recognize critical symptoms like vaginal bleeding or reduced fetal movements sometimes with fatal consequences [2,9]. Strikingly, studies repeatedly find that a woman's background her education, martial situation, and how often she sees a doctor during pregnancy strongly influences both what she knows and how quickly she seeks care if something goes wrong [6,9].

This is particularly relevant to Pakistan, where high ratesof maternal sickness and mortality persist, mostly as a result of missed warning signals and delays in accessing appropriate care. This is especially true in Khyber Pakhtunkhwa region. Sadly, not much study has been done on how much women at big institutions like Peshawar's Hayatabad Medical Complex (HMC) truly know about these risks. What women know about their risks is shaped by local conditions, such as literacy rates, societal norms, and even the way healthcare is accessible.

Assessing pregnant women's awareness of obstetric risk indications in this area and determining the factors influencing their understanding are obviously critical needs. If we want to create more effective teaching methods and eventually save more lives, this knowledge is essential. This study's goal is to determine the degree to which pregnant patients who visit the outpatient department at HMC, Peshawar, are aware of these warning signs and whether variables are associated with greater or lower awareness.

Materials and Methods

Study Design and Setting

This is a cross sectional study, which was conducted in the Obstetric and Gynaecology Outpatient Department of Medical Teaching Institute, Hayatabad Medical Complex, Peshawar from April 2024 till December 2024.

Study Population
The study populations contained all pregnant women presenting the antenatal OPD at HMC during the study period.

Inclusion criteria:
Pregnant patients of any gestational age who presented the OPD, were willing to participate and provided informed written consent.

Exclusion criteria: Women presenting with serious obstetric or medical emergencies requiring immediate clinical intervention were excluded to ensure patient safety and avoid disruption of emergency care.

Sample Size
The sample size was calculated using a WHO sample size calculator, assuming a 50% prevalence of adequate awareness of obstetric danger signs, a 95% confidence interval, and a 5% margin of error (7). To account for a possible 10% non-response rate, the final sample size was adjusted to 422 participants.
Participants were recruited using a systematic random sampling technique based on the daily registration log of the antenatal clinic. The sampling interval was determined by dividing the average daily patient attendance by the required number of participants per day.

Data Collection
After approval from Institutional Review Board (IRB) of Hayatabad Medical Complex, Peshawar, data were collected through a structured, pre-tested, interviewer-administered questionnaire, developed after a comprehensive review of relevant literature and existing validated instruments (1,3,7). The tool was reviewed by subject experts to ensure content validity, translated into local languages (Urdu and Pashto), and piloted among a subset of participants (excluded from final analysis) to confirm clarity and cultural appropriateness. The questionnaire comprised four main sections: socio-demographic characteristics (including age, residence, marital status, educational status, occupation, and monthly household income); obstetric and clinical history (covering gravidity, parity, gestational age, previous pregnancy outcomes and complications, number of antenatal care [ANC] visits, and history of adverse maternal or perinatal outcomes); awareness of obstetric danger signs (unprompted recall of key signs during pregnancy, labor, and postpartum, such as severe vaginal bleeding, swollen face or hands, blurred vision, convulsions, prolonged labor, retained placenta, heavy postpartum bleeding, fever, foul-smelling discharge, and loss of fetal movement); and sources of information (identifying whether information was received from healthcare providers, mass media, community health workers, peers or family, and social media or digital platforms). All interviews were conducted in a private setting within the outpatient department (OPD) by trained female data collectors to ensure confidentiality and promote participant comfort.
The primary dependent variable was the participant's awareness of obstetric danger signs, categorized during analysis as good, fair, or poor based on the total number of correctly recalled signs. Independent variables included socio-demographic characteristics (age, residence, education, occupation, income, marital status), obstetric variables (gravidity, parity, gestational age, number of ANC visits, history of complications), and sources of information (healthcare provider, mass media, family or peers, community health workers, and digital media).

Statistical Analysis
Data were reviewed for completeness and entered into SPSS version 26 for analysis. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize participant characteristics and awareness levels.

Bivariate analysis (Chi-square test or Fisher's exact test where appropriate) was performed to assess associations between categorical independent variables and awareness levels. Variables showing $p < 0.05$ in bivariate analysis were further analyzed using multivariable binary logistic regression to identify independent predictors of good awareness. Adjusted odds ratios (AOR) with 95% confidence intervals (CI) were calculated. A p-value < 0.05 was considered statistically significant.

Results:
A total of 427 pregnant women were enrolled in the study. The mean age was 28.6 ± 6.3 years, with the majority aged between 25 and 34 years (60.9%). Participants were nearly evenly divided between urban (48.7%) and rural (51.3%) residence. Regarding education, 25.3% had no formal schooling, 28.6% had primary education, and 46.1% had secondary or higher education. Most households reported a monthly income between PKR 20,000 and 39,999 (45.2%).

Obstetric history revealed that 61.4% were multigravida, while 38.6% were primigravida. Slightly over half (53.4%) were in the 20–36 weeks gestational age group. Just under one-third (31.4%) had attended four or more antenatal care (ANC) visits, while 19.2% were presenting for their first ANC visit. A previous obstetric complication was reported by 20.8% of participants. These details are summarized in Table 1.

Characteristic	Category	n (%)
Age (years)	18–24	98 (23.0)
	25–29	150 (35.1)
	30–34	110 (25.8)
	≥35	69 (16.2)
Residence	Urban	208 (48.7)
	Rural	219 (51.3)
Education	None	108 (25.3)
	Primary	122 (28.6)
	Secondary & above	197 (46.1)
Monthly Income (PKR)	< 20,000	132 (30.9)
	20,000–39,999	193 (45.2)
	≥ 40,000	102 (23.9)
Gravidity	Primigravida	165 (38.6)
	Multigravida	262 (61.4)
Gestational Age (weeks)	<20	103 (24.1)
	20–36	228 (53.4)
	>36	96 (22.5)
ANC Visits (current)	First visit	82 (19.2)
	2–3 visits	211 (49.4)
	≥4 visits	134 (31.4)
Previous Complication	Yes	89 (20.8)
	No	338 (79.2)

Table 1: Table 1. Socio-demographic and Obstetric Characteristics of Study Participants

Awareness of obstetric danger signs was generally low (Table 2). Only **19.2%** (n = 82) of respondents demonstrated good awareness (defined as the ability to recall four or more key danger signs), while 42.4% (n = 181) had fair awareness (1–3 signs), and 38.4% (n = 164) had poor awareness (could not name any danger sign) (Table 2, Figure 1).

Awareness Level	
Good (≥4 danger signs)	82 (19.2)
Fair (1–3 danger signs)	181 (42.4)
Poor (0 danger signs)	164 (38.4)
Danger Sign	
Severe vaginal bleeding	180 (42.2)
Swollen face/hands	62 (14.5)
Blurred vision	54 (12.6)
Convulsions	41 (9.6)
Loss of fetal movement	72 (16.9)
Heavy postpartum bleeding	113 (26.5)
High fever	78 (18.3)
Foul-smelling discharge	36 (8.4)
Prolonged labor	33 (7.7)
Retained placenta	21 (4.9)
Source of information	
Healthcare provider	166 (38.9)
Family/friends	124 (29.0)
Mass media (TV/Radio)	56 (13.1)
Social media/Internet	23 (5.4)
Community health worker	45 (10.5)

Table 2. Awareness of Obstetric Danger Signs and Sources of Information
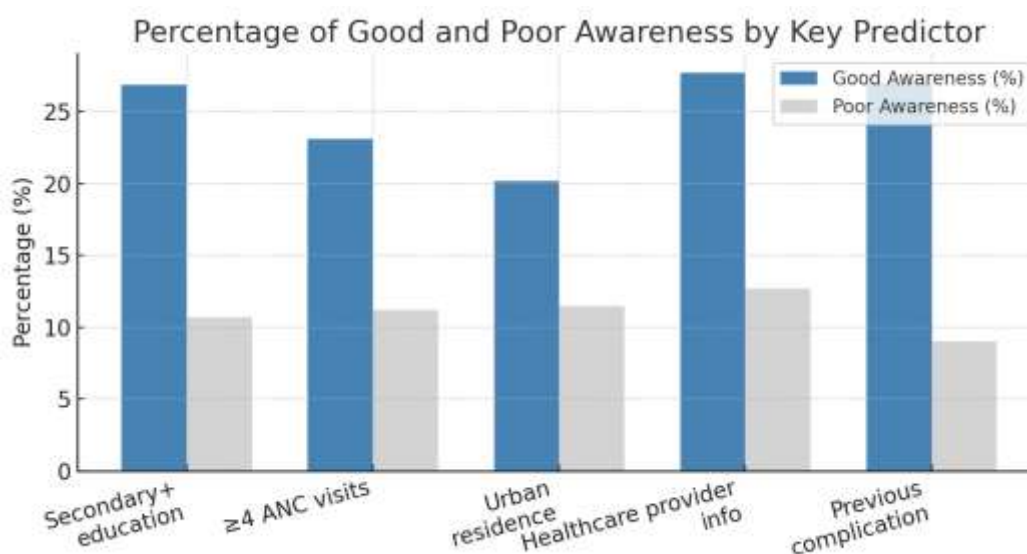
The most commonly identified danger sign was **severe** vaginal bleeding (42.2%), followed by heavy postpartum bleeding (26.5%), high fever (18.3%), and loss of fetal movement (16.9%). Other critical signs, such as swollen face/hands (14.5%), blurred vision (12.6%), convulsions (9.6%), and foul-smelling discharge (8.4%), were recalled much less frequently (Figure 2).
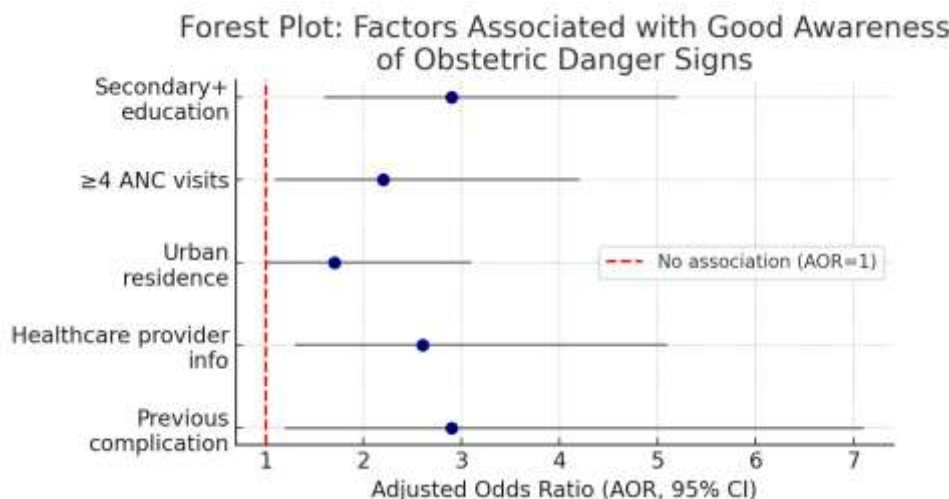
Regarding sources of information, 38.9% cited healthcare providers, 29.0% family or friends, 13.1% mass media, 10.5% community health workers, and only 5.4% social media or internet. Table 3 presents the results of bivariate and multivariate analyses for factors associated with good awareness. On bivariate analysis, good awareness was significantly more likely among women with secondary or higher education (26.9% vs. 10.7% for no formal education, p < 0.001), those with four or more ANC visits (23.1% vs. 11.2% for first visit, p = 0.002), and those with a history of previous obstetric complication (27.0% vs. 9.0%, p = 0.001). Urban residence (20.2% vs. 11.5%, p = 0.040) and receiving information from a healthcare provider (27.7% vs. 12.7%, p = 0.001) were also significantly associated with good awareness.

Variable	Good Awareness n/N (%)	Poor Awareness n/N (%)	p-value	Adjusted OR (95% CI)	p-value (AOR)
Secondary+ education	53/197 (26.9)	21/197 (10.7)	<0.001	2.9 (1.6–5.2)	<0.001
≥4 ANC visits	31/134 (23.1)	15/134 (11.2)	0.002	2.2 (1.1–4.2)	0.021
Urban residence	42/208 (20.2)	24/208 (11.5)	0.040	1.7 (1.0–3.1)	0.045
Healthcare provider info	46/166 (27.7)	21/166 (12.7)	0.001	2.6 (1.3–5.1)	0.006
Previous complication	24/89 (27.0)	8/89 (9.0)	0.001	2.9 (1.2–7.1)	0.018

Table 3. Factors Associated with Good Awareness of Obstetric Danger Signs

In the multivariable logistic regression model, secondary or higher education (AOR: 2.9, 95% CI: 1.6–5.2, p < 0.001), attending ≥4 ANC visits (AOR: 2.2, 95% CI: 1.1–4.2, p = 0.021), urban residence (AOR: 1.7, 95% CI: 1.0–3.1, p = 0.045), receiving information from a healthcare provider (AOR: 2.6, 95% CI: 1.3–5.1, p = 0.006), and previous obstetric complication (AOR: 2.9, 95% CI: 1.2–7.1, p = 0.018) remained independently associated with good awareness.

These findings are visually presented in Figure 1, which displays the adjusted odds ratios (AORs) and 95% confidence intervals for the main predictors using a forest plot. Figure 2 provides a bar chart showing the proportion of women with good and poor awareness within each key predictor subgroup, further emphasizing the impact of education, ANC attendance, provider counseling, and complication history.

Discussion
This study assessed the awareness of obstetric danger signs and associated factors among pregnant women attending the outpatient department of Hayatabad Medical Complex, Peshawar. The findings demonstrate that overall awareness is still suboptimal, with only 19.2% of participants able to recall

four or more key danger signs. This is consistent with previous studies from Bhutan, Nepal, and other LMICs, where good knowledge was reported in less than one-fourth of pregnant women [3,8,10]. In a recent multicountry South Asian analysis, even with expanding antenatal care coverage, comprehensive knowledge of danger signs remains low [11].

Among the danger signs, severe vaginal bleeding, heavy postpartum bleeding, and high fever were most commonly identified by participants, whereas signs such as blurred vision, convulsions, and foul-smelling discharge were poorly recognized. Similar patterns have been documented in large-scale studies from sub-Saharan Africa and South Asia, emphasizing a widespread deficit in recognition of critical but less overt symptoms [12–14]. The limited awareness of these signs may contribute to delayed healthcare-seeking and higher maternal morbidity and mortality, a trend reflected in several recent systematic reviews [15,16].

In this study, higher maternal education, urban residence, multiple ANC visits, prior obstetric complications, and receiving information from healthcare providers were all significantly associated with good awareness. The relationship between educational attainment and knowledge is well-established, as supported by recent data from Bangladesh, Afghanistan, and Ghana, where mothers with at least secondary education are significantly more likely to identify key obstetric danger signs [17–19]. Similarly, frequency of ANC attendance and provider-based counseling have consistently emerged as important predictors of awareness and appropriate healthcare-seeking in diverse settings [1,20].

It is noteworthy that healthcare providers were the main source of information for 38.9% of women with good awareness, underscoring the importance of structured health education during ANC visits. However, the relatively low contribution of mass media and digital platforms suggests missed opportunities for broader outreach, particularly in rural or underserved populations [21]. Recent evidence also indicates that leveraging community health workers and integrating mobile health (mHealth) interventions can enhance awareness and early recognition of maternal complications [22,23].

These findings have clear policy implications. The persistent gap in danger sign awareness—despite increasing ANC coverage—highlights the need for a more proactive, standardized, and context-specific approach to maternal health education. The World Health Organization's latest recommendations emphasize integrating structured danger sign counseling into every ANC contact, especially in resource-constrained settings [24]. Community engagement, empowerment of health workers, and innovative use of media and mobile technologies may further accelerate gains in awareness and care-seeking [22,25].

The present study is subject to some limitations. As a cross-sectional study in a single tertiary hospital, findings may not fully generalize to rural or primary care settings. The exclusion of emergency cases may underrepresent women with the highest risk and exposure to maternal health information. In addition, using unprompted recall as the method of knowledge assessment may have underestimated latent knowledge, although this approach reflects real-world conditions where prompt recognition is crucial [8,26].

Despite these limitations, this study provides robust evidence of the urgent need to improve awareness of obstetric danger signs among pregnant women in Khyber Pakhtunkhwa. Interventions focusing on education, regular ANC, and innovative communication strategies are vital for reducing delays in care-seeking and ultimately lowering preventable maternal deaths.

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