

ORIGINAL ARTICLE

Are Rural Women Aware of Obstetric Danger Signs? A Cross-Sectional Study among Newly Delivered Mothers in 17 Villages under Two Subcenters of Sarjapur PHC, South Karnataka, India

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ABSTRACT

Background: Awareness of obstetric danger signs reduces delays in seeking care and forms a crucial part of birth preparedness and complication readiness (BPCR), an evidence-based strategy to reduce maternal and neonatal mortality. **Objective:** The objective of the study was to assess awareness of obstetric danger signs and its determinants among rural women in South Karnataka. **Materials and Methods:** A cross-sectional study in 17 villages of South Karnataka was conducted, with simple random sample of 100 mothers who delivered in the past 1 year. Awareness of 18 obstetric danger signs by JHPIEGO-BPCR Tools and Indicators was assessed under four domains: Pregnancy, labor, postpartum, and newborn period. Each correct response given a score of 1. Mann–Whitney U-test, Kruskal–Wallis test, and Spearman’s rank correlation test done. **Results:** Median awareness score was 4 (IQR = 1.6) with 24% of subjects unable to state even one danger sign across any domain. The most common danger sign mentioned was vaginal bleeding. Most were unaware of danger signs such as blurred vision and convulsions. Awareness was significantly higher among older ($P = 0.019$) and educated mothers ($P = 0.044$), of higher income ($P = 0.041$), with more frequent antenatal care (ANC) visits ($P = 0.001$), and higher parity ($P = 0.013$). **Conclusion:** The abysmally low awareness of obstetric danger signs has far-reaching public health implications as it affects timely care seeking. Health-care providers should use opportunities during regular ANC visits to counsel women and families regarding danger signs, in addition to community engagement, utilizing existing platforms such as women’s groups, village-level workers, and Village Health and Nutrition Days, focusing more on younger women who are educationally and economically challenged to improve awareness regarding obstetric danger signs.

Key words: Birth preparedness, complication readiness, danger signs, rural women

INTRODUCTION

Globally, around 300,000 mothers die each year, nearly one-fifth of maternal deaths being contributed by South Asia.^[1] Maternal mortality ratio (MMR) in India is currently still unacceptably high at 122/100,000 live births.^[2] Neonatal mortality rate (NMR) at 23/1000 live births makes India the largest contributor to neonatal deaths in the world.^[3,4] Evidence-based strategies introduced by the Government of India to further decrease MMR and NMR include birth preparedness and complication readiness (BPCR).^[5] This is a

strategy devised by Thaddeus and Maine to address the three common delays that are linked to maternal deaths; (i) delay in deciding to seek care if complication occurs, (ii) delay in reaching care, and (iii) delay in receiving care.^[6] Postpartum bleeding, unsafe abortion, high blood pressure during pregnancy, and postpartum infections are the most common causes of maternal death and can occur because of any of these delays.^[1] To address the three delays at various levels, Johns

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Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO) developed the BPCR matrix as part of their Maternal and Neonatal Health Program.^[7] The delay in deciding to seek timely care is highly dependent on the awareness of the mother regarding obstetric danger signs. JHPIEGO has listed the key obstetric danger signs under four domains of pregnancy, labor, postpartum, and neonatal period, which are vital for women, their families, the community, health providers, and policy makers to be aware of. Awareness of obstetric danger signs among these important stakeholders will improve problem recognition, reduce delay in deciding to seek care, and will hasten reaching medical facilities.^[7]

Information literacy is essential for the success of public health strategies. However, rural communities tend to have lower awareness regarding health due to lack of education and opportunity as well as lack of access to information.^[8] Despite BPCR being a focused strategy in the National Health Mission to improve maternal and neonatal indicators,^[5] very little is known about the awareness of obstetric danger signs among rural Indian women, which could potentially lead to delay in seeking timely care. This study, therefore, seeks to assess the awareness of obstetric danger signs and its determinants among rural mothers. The evidence from this study would help identify the gaps in their awareness and help to design community-based targeted interventions to improve awareness of obstetric danger signs.

MATERIALS AND METHODS

Study Setting

This was a cross-sectional study undertaken conducted in 17 villages of two subcenters (Mugalur and Kuthganahalli) of Sarjapur Primary Health Centre, Anekal Taluk, around 35 km from Bengaluru, consisting of a total population of about 12,000. The data were collected over 2 months and analysis was completed in 2 months in 2019.

Sampling

Based on the previous study conducted in a tertiary hospital in Mangalore city,^[9] where 67.1% of the mothers were aware of vaginal bleeding as a danger sign, with 10% margin of error, 95% confidence level, and 10% non-response rate, the sample size was calculated to be 94 and was rounded off to 100. A list of mothers who had delivered in the past 1 year was compiled from all the Anganwadis in the two subcenter areas, and a simple random sample of 100 mothers was drawn from this sampling frame.

Inclusion Criteria

Women who had delivered within the past 1 year and women who were permanent residents in the study area were included in the study.

Exclusion Criteria

Women who were seriously ill, not able to comprehend the questions because of mental health issues or who were not available for interview even after two visits to their houses were excluded from the study and replaced by another mother randomly selected from the list.

Study Instrument

A pre-tested, structured interview schedule, translated into the local language Kannada, was administered to capture sociodemographic and obstetric details of the subject. Socioeconomic status was determined using Modified BG Prasad socioeconomic classification.^[10] Questions on awareness of obstetric danger signs were obtained from JHPIEGO's BPCR Tools and Indicators for Maternal and Newborn Health. Awareness was assessed as 18-item across four domains: (i) Pregnancy, (ii) labor, (iii) postpartum period, and (iv) newborn period.^[7] Each of the 18 listed danger signs was given a score of 1, and the total awareness score was noted for each subject. After the interview, each participant was educated about obstetric danger signs.

Ethical Considerations

Approval for the study was obtained from the Institutional Ethics Committee. Written informed consent was obtained from the participants.

Statistical Analysis

The data were analyzed using IBM Statistical Package for the Social Sciences version 20. The study variables were described using frequencies, proportions, mean and standard deviation, median, and interquartile range (IQR). Data were tested for normality using Shapiro–Wilk test and normality probability plot. Difference between median awareness scores among the independent covariates was tested using Mann–Whitney U-test and Kruskal–Wallis test. $P < 0.05$ was considered statistically significant for all analyses.

RESULTS

Sociodemographic Details

A total of 100 women participated in this study. About 57% from Mugalur subcenter area and 43% from Kuthganahalli subcenter area. The mean age of the study participants was 23.5 ± 2.62 years (range = 19–32 years). Majority of the study population were Hindu's (99%) by religion, currently married (99%), and homemakers (97%). The average number of members in a family was 5.2 ± 1.8 persons (range = 3–12). The median per capita monthly income was Rs. 2500 (IQR: 1688–3938). Mean age at marriage was 19.88 ± 1.65 years (range = 16–24 years).

Obstetric Details

All participants had a minimum of four antenatal visits and all had their first antenatal care (ANC) checkup before 12 weeks of pregnancy. About 96% received ANC from a doctor and 4% from nurse. Severe vaginal bleeding (1%), premature rupture of membrane (1%), and high blood pressure (2%) were the complications reported during pregnancy. Four (4%) gave a history of previous abortion. Most (65%) received obstetric care in government hospital, rest in private clinics and there was one home delivery.

Awareness of Obstetric Danger Signs

The most common danger sign mentioned during pregnancy, labor, and postpartum period was vaginal bleeding (54%, 50%, and 44%, respectively). In the neonatal period, the most common mentioned danger sign was difficulty in breathing (28%). Most women were unaware of important obstetric danger signs such as blurred vision during pregnancy, convulsions during labor, high fever during postpartum period, and convulsions in the newborn [Figure 1].

Not even one danger sign during pregnancy and labor could be stated by 34% and 49% of women, respectively. Inability to state at least one danger sign during postpartum and

neonatal period was found among 54% and 38% of women, respectively. The proportion of women who could state at least three obstetric danger signs in each domain was very low [Table 1]. The total danger signs awareness score ranged from 0 to 11, with 24% of subjects not able to state any danger sign at all (total awareness score of 0). The mean awareness score was 3.7 (SD \pm 3.1) and median score was 4 (IQR = 1.6).

Determinants of Awareness

Median awareness score was significantly higher among older mothers (25 years or more) as compared to mothers who came under the age category of youth, that is, 18–24 years ($P = 0.019$). Pre-university or higher education among

Table 1: Study participants' level of awareness of danger signs across four domains

Domain	Not aware of a single danger sign	Able to state at one or two danger signs	Able to state at least three danger signs
Pregnancy	34 (34)	48 (48)	18 (18)
Labor	49 (49)	51 (51)	0 (0)
Postpartum period	54 (54)	42 (42)	4 (4)
Neonatal period	38 (38)	55 (55)	7(7)

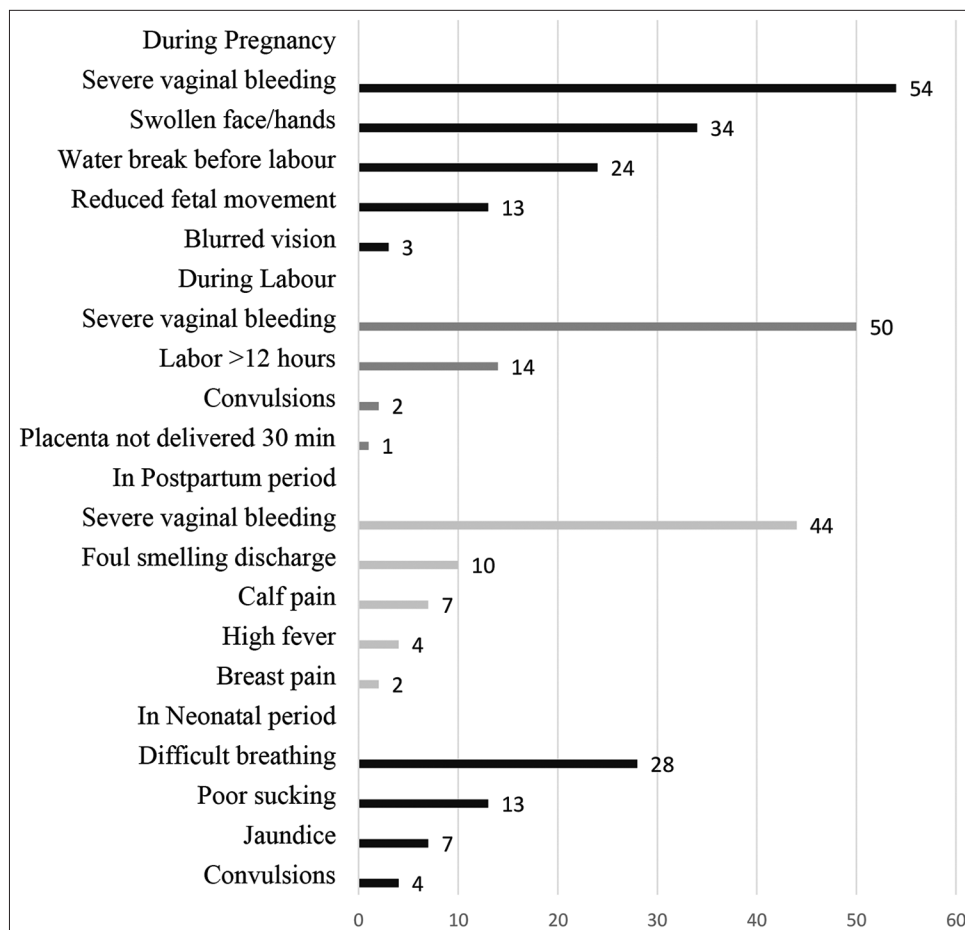


Figure 1: Awareness of obstetric danger signs across four domains, $n=100$

subjects ($P = 0.044$) and their husbands ($P = 0.039$) were significantly associated with higher awareness score, as also upper socioeconomic class ($P = 0.041$) [Table 2].

Positive correlation was found between awareness and number of ANC visits and parity. As the number of ANC visits increased, the awareness score increased ($r = 0.361$, $P < 0.001$). With increasing parity, awareness score also increased ($r = 0.25$, $P = 0.013$). These increments were numerically small, but statistically significant [Table 3]. No significant association was found with regular place of ANC or place of delivery, that is, government or private health center.

DISCUSSION

In the present study, we looked at how aware rural women are regarding obstetric danger signs. We assessed “awareness” rather than “knowledge,” as in the knowledge domain, awareness is considered more general and sits at the lower end of the continuum, while knowledge which is considered detailed and specific sits at the higher end.^[11] We also chose

women who had already delivered, rather than pregnant women, to allow for sufficient contact with the health system during the duration of pregnancy, labor, and postpartum.

We found that the overall awareness of obstetric danger signs among our study population was very low with a quarter of the study participants not able to state even a single obstetric danger sign across any of the four domains. While studies in rural communities of West Bengal by Mazumdar *et al.*^[12] and in Central Ethiopia by Kaso and Addisse^[13] have shown similar poor knowledge, one study in rural Karnataka by Rakesh *et al.*^[14] found that 76% of women were aware of at least one danger sign in pregnancy, and a study in Nigeria by Doctor *et al.*^[15] found that 77.6% of women were able to state at least one danger sign in labor. These proportions were much found to be much lower in our study. This difference might be due to the difference in study settings, as both of those studies were hospital based, while the present study is community based. There might have been health education material displayed in the hospital which might have contributed to higher level of knowledge among their study subjects. Those unable to access regular hospital care may also have lower awareness due to lack of opportunity to avail health education sessions by health-care providers. This was also supported in our study by the finding that awareness increased with more ANC visits, indicating that ANC visits are an opportunity for improving health literacy of pregnant women, and health-care providers must take care to ensure that they stress on the obstetric danger signs that women must be aware of.

Studies in rural Africa in Tanzania,^[16] Uganda,^[17] and Ethiopia^[18] have indicated an overall better awareness level among rural African women, than in our study. The study in rural Ethiopia by Mengesha and Taye reported that the proportion of women who knew at least three danger signs in pregnancy and labor was 47% and 45.7%, respectively,^[18] which was much higher than 18% and 0% found in our study. This could be a reflection of the focused and targeted community-based interventions in BPCR that has been part of the maternal health programs of these African nations in the past decade.

We found that the most common obstetric danger sign that women were aware of, was vaginal bleeding. In our study, more than half (54%) of respondents mentioned severe vaginal bleeding as key danger sign during pregnancy, which is higher when compared to studies in rural West Bengal (25.5%)^[12] and villages near Delhi (20.1%).^[19] The higher education levels among the rural women in our study may have accounted for this higher awareness. Severe vaginal bleeding and prolonged labor were the commonly mentioned danger signs during labor, while severe vaginal bleeding and foul smelling discharge were the commonly stated danger signs in postpartum period. This mirrors the findings of a community-based rural study in Ethiopia among 3612 women,^[20] which

Table 2: Association of danger signs awareness score with various sociodemographic variables, $n=100$

Variable	Category	Total <i>n</i> (%)	Awareness score	
			Median (IQR)	<i>P</i> value
Age group (in years)	≤24	74 (74)	3 (1.5)	0.019*†
	≥25	26 (26)	6 (1.8)	
Education of subject	Up to high school	63 (63)	2 (0.5)	0.044*†
	Pre-university and above	37 (37)	5 (1.8)	
Education of spouse	Up to high school	67 (67)	3 (0.5)	0.039*†
	Pre-university and above	33 (33)	5 (1.8)	
Type of family	Nuclear	37 (37)	3 (1.5)	0.347†
	Joint/three generation/extended	63 (63)	4 (0.7)	
Socioeconomic class	Upper/Upper-middle class	29 (29)	6 (1.8)	0.041**
	Middle class	33 (33)	3 (1.5)	
	Lower-middle/lower class	38 (38)	3 (1.5)	

*Indicates statistical significance at $P < 0.05$, †Mann–Whitney U-test, ‡Kruskal–Wallis test

Table 3: Correlation between awareness score and independent covariates (continuous variables), $n=100$

Variable	Correlation coefficient <i>r</i> †	<i>P</i> value
Number of antenatal care visits	0.361	<0.001*
Parity	0.25	0.013*

*Indicates statistical significance at $P < 0.05$, †Spearman’s rank correlation test

shows that even with cultural and geographic diversity of the various studies, severe bleeding is the common obstetric danger sign cited by women. Higher education among subjects and their husbands and higher socioeconomic class were significantly associated with higher awareness levels. The findings correlate well with the other studies done in Ethiopia by Mengesha and Taye^[18] Tanzania by Urassa *et al.*,^[21] in Kenya by Mutiso *et al.*,^[22] and by Kakaire *et al.* in Uganda^[23] and imply that higher education and income give better access to health information and health-care services, and therefore, those who are of low income and marginalized groups must receive additional attention for health education. Awareness score was significantly higher among older mothers and those of higher parity. This indicates that experiential learning plays a role in awareness, and that mothers who are young and obstetrically inexperienced should be the focus of interventions to improve awareness of obstetric danger signs.

No significant association was found with regular place of ANC or place of delivery, that is, government or private health center, indicating the need for capacity building among public health staff to promote BPCR and awareness of danger signs. Health-care providers should be sensitized about the opportunity provided by regular ANC visits and utilized these opportunities for improving awareness of obstetric danger signs.

Time and again, studies have shown the importance of BPCR as an evidence-based key strategy in the reduction of maternal and early NMRs. The lack of awareness of obstetric danger signs in our study population has far-reaching public health implications in slowing down the progress that has been made thus far in maternal and child health, since mothers who are unaware of danger signs are likely to delay seeking timely care, with disastrous consequences. It is recommended, therefore, that pregnant women and their families should receive information regarding obstetric danger signs during routine antenatal visits as well as from village-level workers such as ASHA, ANM, and Anganwadi worker. Communities should be sensitized regarding obstetric dangers signs through existing platforms such as women's groups and Village Health and Nutrition Days.

Limitations of the Study

We included women who had delivered within the past 1 year, and therefore, the element of recall bias may have been introduced into the study.

CONCLUSION

Our study found that overall awareness of obstetric danger signs among rural women in Karnataka was abysmally low, with a quarter of the subjects not able to state even one

danger sign across any of the four domains: Pregnancy, labor, postpartum, and neonatal period. The most common danger sign mentioned was vaginal bleeding. Most women were unaware of important obstetric danger signs such as blurred vision and convulsions. The lack of awareness of obstetric danger signs in our study population has far-reaching public health implications since mothers who are unaware of danger signs are unlikely to seek timely care. Awareness was significantly higher among older and educated mothers of higher income group, with more ANC visits and higher parity. Health-care providers should be sensitized about opportunities provided during regular ANC visits to counsel women and their families regarding danger signs. Policy-makers should promote community engagement, utilizing existing platforms such as women's groups, village-level workers, and Village Health and Nutrition Days, focusing more on younger women who are educationally and economically challenged to improve awareness regarding obstetric danger signs.

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Nil.

CONFLICTS OF INTEREST

None declared.

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Nil.

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