Awareness of Obstetric and Newborn Danger Signs Among Rural Pregnant Women in Belagavi: A Community-Based Cross–Sectional Study

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Abstract:

Introduction: Globally, as per WHO Statistics 2017, approximately 810 women die every day from preventable causes related to pregnancy and childbirth. Maternal morbidity and mortality could be prevented to a greater extent if women and their families recognize obstetric danger signs and thus reduce the delay in seeking health care at the right time. **Objectives:** The study was done to assess the awareness of key danger signs in pregnancy, labour and childbirth, postpartum (first two days after delivery) and in newborn during first seven days after delivery among rural pregnant women. **Methods:** A community based cross – sectional study was conducted among 400 pregnant women who had completed 28-week gestation in the rural field practice area of a Primary Health Centre, Belagavi, Karnataka for one year from 1st January 2019 to 31st December 2019. Stratified purposive sampling method with population proportionate sampling was used across nine sub-centers. **Results:** The mean age of the study participants was 24.3±3.6 years. Out of the 400 pregnant women in the study, 73 (18.2%) had good awareness about obstetric and newborn key danger signs. Those who were in ≥ 25 years age group (AOR:3.259, p<0.001), those who belonged to upper and middle socio-economic class (AOR:2.600, p=0.002) and multigravida (AOR:10.205, p<0.001) were positively associated with better awareness about the key danger signs. **Conclusion:** Two out of ten pregnant women were having good knowledge about the danger signs during pregnancy, labour and childbirth, postpartum and newborn. Good awareness was associated with age, socio-economic status and gravida.

Keywords: Awareness; Antenatal women; Rural; Danger signs; Newborn

Introduction:

Pregnancy is a sensitive period during which a woman may face unexpected life threatening complications leading to maternal morbidity, mortality and also affects health of newborn.[1] Globally, as per WHO Statistics 2017, approximately 810 women die every day from preventable causes related to pregnancy and childbirth.[2] In India, every twenty minutes a mother is dying due to pregnancy or childbirth related cause.[3] According to Sample Registration System (SRS) 2016-2018 data the MMR in India was 113 / 1,00,000 live births.[4] Most of the maternal deaths occur during labour, delivery and within 24 hours post partum.[5] One-third of the neonatal deaths occur on the first day of life and two-thirds occur during the first week after birth.[6] Nearly 75 % of all maternal deaths are due to severe bleeding, infections, high blood pressure during pregnancy, complications from delivery and unsafe abortion.[2]

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Danger signs are symptoms that are recognized by non-clinical personnel easily, but not the true obstetric complications. According to Thaddeus and Maine (1994), the three obstetric delays contributing to maternal mortality are: delay in seeking health care, delay in identifying and reaching the medical facility and delay in receiving adequate and appropriate treatment.[7]

Evidence from various studies across India have shown inadequate awareness of obstetric and newborn danger signs among pregnant women. In a study conducted in 2016-18, in the urban slums of Raipur city, Chhattisgarh among 160 pregnant women and 70 recently delivered mothers, the awareness about the danger signs in all phases of pregnancy and childbirth and newborn was very poor. Only 7.4 % had awareness regarding the postpartum danger signs.[8] Similarly, a study conducted among 170 pregnant women in Dakshina Kannada district, Karnataka in 2017, revealed that they had a very poor knowledge of the specific obstetric danger signs.[9] These findings highlight the persisting inadequacy of knowledge regarding obstetric and newborn danger signs, across different healthcare settings. The authors highlighted that poor awareness contributed to delays in seeking care and emphasized the need for continuous health education interventions in improving maternal and fetal outcomes.[8-9] Maternal morbidity and mortality could be prevented to a greater extent if women and their families recognize obstetric danger signs and thus reduce the delay in seeking health care at the right time.[1]

Hence, this study was conducted primarily to assess the awareness about key danger signs in pregnancy, labour & childbirth, during first two days after delivery and in newborn during first seven days after delivery. The secondary objective of the study was to determine the socio-demographic factors associated with the knowledge about obstetric and newborn key danger signs.

Methods:

A community-based cross-sectional study was conducted among 400 pregnant women in the rural field practice area of a Primary Health Centre, Belagavi, Karnataka for one year from 1st January 2019 to 31st December 2019. The sample size was calculated using the formula $n = 4pq/d^2$, taking the prevalence (p) of awareness of danger signs as 54.7 % and allowable error as 5 %.[9] The rural field practice area of the Primary Health Centre consisted of nine sub - centres with a mid year population of 73,474. The total number of ANCs registered in the year 2017-2018 was 1,494. Participants were recruited using stratified purposive sampling method with population proportionate sampling across nine sub-centres. Written informed consent was obtained from all the study participants before the data collection.

Registered antenatal women who consented, had completed 28 weeks of gestational age and were permanent residents of the study area (residing at least one year preceding the survey) were included in the study. Pregnant women who did not respond after three consecutive attempts were excluded from the study.

The studies conducted earlier were mostly among pregnant women of all trimesters and postnatal women and have reported low awareness of obstetric and newborn danger signs. Community evaluations in India show that knowledge increases after targeted antenatal health education or with more antenatal visits.[10] Hence, in the present study, pregnant women more than 28 weeks gestation age only were included as they were more likely to have had multiple ANC visits.

Ethical clearance was obtained from the Institutional Ethics Committee for Human Subjects Research of the Medical College. Data collection was done through antenatal care (ANC) camps conducted at each sub centre. The details of the number of registered pregnant women who had completed 28 weeks of gestational age for every month were collected from the Auxiliary Nurse Midwife of each sub centre. Pre validated, tested and modified questionnaire regarding socio demographic details and knowledge of key danger signs of pregnancy, labour & childbirth, postpartum and in newborn from Safe Motherhood Population Based Survey Questionnaire on monitoring of Birth Preparedness and Complication Readiness (BPCR) from the John Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO) manual was used for the personal interview.[7]

Out of 37 total danger signs, 14 were considered as key danger signs during pregnancy, labour and childbirth, postpartum (first 2 days after delivery) and newborn (first 7 days after delivery). The key danger signs during pregnancy include severe vaginal bleeding, swollen hands/face and blurred vision. The key danger signs during labor and childbirth include severe vaginal bleeding, prolonged labor (> 12 hours), convulsions and retained placenta. The key danger signs during the postpartum period include severe vaginal bleeding, foul-smelling vaginal discharge and high fever. The key danger signs in the newborn include convulsions/ spasms/rigidity, difficult/fast breathing, very small baby and lethargy/unconsciousness.[7] Multiple responses were obtained for awareness of key danger signs. Based on references from previous studies, knowledge of at least 8 key danger signs out of 14 was considered as having good awareness.[5,11]

The data collected was coded and entered in the MS Excel sheet. Data was analyzed with Statistical Package for Social Sciences (SPSS) for Windows Trial Version 25.0. Chicago, SPSS Inc. Frequency and percentages were calculated. Multiple logistic regression was used to find association between dependent and independent variables. p value < 0.05 was considered statistically significant.

Results:

In the present study, the mean age of pregnant women was 24.3 ± 3.6 years, with age of the participants ranging from 18 to 40 years. Among the total study participants, 242 (60.5 %) were multigravida and 264 (66 %) were at less than 34 weeks of gestation. (Table 1)

The number of pregnant women aware of all obstetric and newborn key danger signs is given in Table 2. Out of the 400 pregnant women in the study, 74 (18.5 %) had good awareness and 326 (81.5 %) had poor awareness about obstetric and newborn key danger signs. The awareness about the individual key danger signs during pregnancy, labour & childbirth, postpartum and in newborn is shown in Table 3.

According to Table 4, Multivariate logistic regression showed that those pregnant women who were

Table 1: Distribution of study participants according to their socio-demographic details and gestational details (N = 400)

Socio-demographic and gestational details	n (%)
Age (in years)	
18-20	54 (13.5 %)
20-25	210 (52.5 %)
25-30	115 (28.8 %)
>30	21 (5.2 %)
Religion	
Hindu	362 (90.5 %)
Muslim	34 (8.5 %)
Christian	4 (1.0 %)
Education	
Illiterate	20 (5.0 %)
Primary (1-8th)	79 (19.7 %)
Secondary (9-10th)	148 (37.0 %)
Higher Secondary (11-12th)	97 (24.2 %)
Graduate	52 (13.1 %)
Postgraduate	4 (1.0 %)
Occupation	
Homemaker	389 (97.2 %)
Self employed	7 (1.8 %)
Non government employee	4 (1.0 %)
Socio economic status (Modified BG Prasads Classification)	
Class I	29 (7.2 %)
Class II	84 (21.0 %)
Class III	117 (29.3 %)
Class IV	133 (33.3 %)
Class V	37 (9.2 %)
Gravida	
Primigravida	158 (39.5 %)
Multigravida	242 (60.5 %)
Gestational age (in weeks)	
28-30	120 (30.0 %)
30-33	144 (36.0 %)
33-36	71 (17.8 %)
>36	65 (16.2 %)

Table 2: Distribution of study participants according to knowledge of all key danger signs during pregnancy, labour & childbirth, postpartum and in newborn (N = 400)

Variable	n (%)
Knew all three key danger signs during pregnancy	36 (9.0 %)
Knew all four key danger signs during labour & childbirth	2 (0.5 %)
Knew all three key danger signs during first two days after delivery	23 (5.8 %)
Knew all four key danger signs in newborn (during first seven days after delivery)	46 (11.5 %)

Table 3: Distribution of study participants according to knowledge of individual key danger signs during pregnancy, labour & childbirth, postpartum and in newborn (N = 400)

Key danger signs	n (%)
Pregnancy	
Severe vaginal bleeding	240 (60.0)
Swollen hands / face	82 (20.5)
Blurred vision	78 (19.5)
Labor & Childbirth	
Severe vaginal bleeding	298 (74.5)
Convulsions	147 (36.7)
Prolonged labour (> 12 hours)	36 (9.0)
Retained Placenta	2 (0.5)
Postpartum (first 2 days after delivery)	
Severe vaginal bleeding	204 (51.0)
Foul smelling vaginal discharge	69 (17.2)
High fever	62 (15.5)
Newborn (first 7 days after delivery)	
Very small baby	145 (36.2)
Convulsions / spasm / rigidity	138 (34.5)
Difficult / fast breathing	127 (31.7)
Lethargy / unconsciousness	81 (20.2)

Table 4: Association between socio–demographic and gestational details and level of awareness regarding key danger signs (N = 400)

Socio demographic & gestational details	Good awareness N=74 n (%)	Poor awareness N=326 n (%)	Crude Odds Ratio (95 % CI)	Adjusted Odds ratio (95 % CI)	p value
Age (in years)					
< 25	29 (39.2)	235 (72.1)	1	1	< 0.001
≥ 25	45 (60.8)	91 (27.9)	4.007 (2.369-6.779)	2.589 (1.473-4.553)	
Education					
Illiterate	1 (1.4)	19 (5.8)	1	1	0.158
Literate	73 (98.6)	307 (94.2)	4.518 (0.595-34.297)	4.503 (0.557-36.419)	
Occupation					
Homemaker	72 (97.3)	317 (97.2)	1	1	0.397
Employed	2 (2.7)	9 (2.8)	0.978 (0.207-4.625)	0.496 (0.098-2.512)	
SES					
Lower	55 (74.3)	175 (53.7)	1	1	0.003
Upper & Middle	19 (25.7)	151 (46.3)	2.498 (1.419-4.395)	2.490 (1.350-4.592)	
Gravida					
Primigravida	5 (6.8)	153 (46.9)	1	1	< 0.001
Multigravida	69 (93.2)	173 (53.1)	12.205 (4.799-31.039)	10.462 (4.036-27.121)	

≥ 25 years age had higher odds (AOR: 3.259, 95 % CI: 1.782-5.958) of having good awareness of key danger signs compared to those < 25 years age and the difference was statistically significant (p < 0.001). Those who belonged to upper & middle SES had higher odds (AOR: 2.600, 95 % CI: 1.406-4.807) of having good knowledge of key danger signs compared to those who belonged to lower SES and the difference was statistically significant (p = 0.002). Multigravida had higher odds (AOR: 10.205, 95 % CI: 3.931-26.493) of having good awareness of key danger signs compared to primigravida and the difference was statistically significant (p<0.001).

Discussion:

In this study, the most common key danger sign known during pregnancy (70.7%), during labour & childbirth (74.5%) and during first two days after delivery (51.0%) was severe vaginal bleeding. Similarly, a study conducted in 2017 in Chhattisgarh among 110 pregnant women, showed that the most common key danger sign known during pregnancy was vaginal bleeding (11.8 %).[11] In a study in 2015 in Nagpur among 100 pregnant women, severe vaginal bleeding (50.0 %) was most commonly known among key danger signs in labour.[12] In 2015, a study in Amritsar and Puducherry, 14.0 % & 32.7 % knew about severe bleeding as a key danger sign during first two days after delivery respectively.[13, 14] The difference was probably because majority of the pregnant women preferred home delivery and did not anticipate any danger signs.

In the present study, 34.5 % knew about convulsions and 31.7 % were aware of difficult / fast breathing among newborn danger signs. Similarly, a Hyderabad study in 2017, among 200 antenatal women found that 38.0 % were aware of convulsions and 31.0 % knew about difficult or fast breathing.[1] Limited participation in or ineffective communication during health education sessions may be contributing to the persistently low awareness of neonatal danger signs across regions.

Among 400 pregnant women in the present study, 18.2 % were aware of at least eight key danger signs during pregnancy, labour, postpartum and in newborn. Whereas a study done in 2017, among 672 pregnant women, in Thailand showed that 74.7 % were aware of at least eight key danger signs which was higher probably due to different study setting and facility-based study.[15]

In present study, those who were in ≥ 25 years age group (AOR: 3.259, 95 % CI: 1.782-5.958, p < 0.001), those who belonged to upper and middle SES (AOR: 2.600, 95 % CI: 1.406-4.807, p = 0.002) and multigravida (AOR: 10.205, 95 % CI: 3.931-26.493, p < 0.001) were positively associated with better awareness about the key danger signs. In a Bangalore study, education of women up to middle / high school and above was statistically significantly associated with knowledge about danger signs of pregnancy (p = 0.008).[16] A study done in Mumbai among 126 pregnant women, found that there was statistically significant association between literacy and knowledge regarding the key danger signs in pregnancy ($\chi 2 = 33.031$, p = 0.00001) and between age-group and knowledge regarding key danger signs during pregnancy ($\chi 2 = 6.310$, p = 0.012).[17] The similarity between the study findings emphasize the role of socio-demographic and obstetric factors in determining awareness levels. This highlights the need for targeted health education sessions concentrating on younger, illiterate, primigravida and lower socio-economic groups to enhance comprehensive awareness of obstetric and newborn danger signs.

Strengths & Limitations:

The strengths of this study were that it was a community based study conducted among a large sample size of rural antenatal women and the results can be generalized and a standard questionnaire was used for the personal interview. The limitations were that it was conducted only among antenatal women and did not include the postnatal women. Hence, there would have been lack of knowledge of danger signs.

Conclusion:

Two out of ten pregnant women had good awareness with knowledge regarding at least eight key danger signs during pregnancy, labour & childbirth, during first two days after delivery and in the newborn during first seven days after delivery. Those who were in ≥ 25 years age group, those who belonged to upper and middle SES and multigravida were positively associated with better awareness about the key danger signs.

Recommendations:

The pregnant women and her family members should be aware of all the key danger signs and anticipate them to reduce delay in seeking health care at the right time. The grass root level workers need to educate the pregnant women regarding the key danger signs. They need to be trained to identify the key danger signs and give adequate health education to the pregnant women regarding identification of key danger signs of pregnancy, labour and childbirth, during first two days after delivery and in newborn during first seven days after delivery to reduce the delay in seeking health care. ANC camps, posters, pamphlets, Mother & Child Protection (MCP) cards and mobile phones can be utilized for health education activities.

Declaration

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Conflict of Interest: Nil

References:

1. Krishna SJ, Venkat CG. Awareness of danger signs during pregnancy, labour, childbirth and during the first seven days of life attending antenatal care at KAMSRC. Int J Reprod Contracept Obstet Gynecol. 2017;6(9):4106-10. doi:10.18203/2320-1770.ijrcog20174070
2. World Health Organization. Maternal morbidity and well-being [Internet]. Geneva: World Health Organization; 2019 [cited 2024 Dec 10]. Available from: https://www.who.int/teams/maternal-newborn-child-adolescent-health-and-ageing/maternal-health/maternal-morbidity-and-well-being
3. UNICEF India. Maternal health [Internet]. New Delhi: UNICEF; 2019 [cited 2024 Nov 13]. Available from: https://www.unicef.org/india/what-we-do/maternal-health
4. Office of Registrar General, India. Sample Registration System: Special Bulletin on Maternal Mortality in India 2016 2018 [Internet]. New Delhi: Government of India; 2020 [cited 2024 Dec 12]. p. 1-4. Available from: https://censusindia.gov.in/nada/index.php/catalog/34781
5. Sehrawat S, Shaiju B, Sarkar S. A cross-sectional study to sssess birth preparedness and complication readiness (BPACR) status in antenatal mothers of selected Primary Health Centre of New Delhi. Int J Nurs Midwifery Res. 2018;5(4):2-7. doi:10.24321/2455.9318.201839
6. World Health Organization. Newborns: reducing mortality [Internet]. Geneva: World Health Organization; 2020 [cited 2024 Nov 13]. Available from: https://www.who.int/en/news-room/fact-sheets/detail/newborns-reducing-mortality
7. JHPIEGO, Monitoring birth preparedness and complication readiness, tools and indicators for maternal and newborn health [Internet]. Baltimore: JHPIEGO; 2004 [cited 2024 Nov 20]. p. 1-31. Available from: https://healthynewbornnetwork.org/hnn-content/uploads/Jhiego_Monitoring-Birth-Preparedness-and-Complication-Readiness-Tools-and-Indicators-for-Maternal-and-Newborn.pdf
8. Chandrakar T, Verma N, Gupta SA, Dhurandhar D. Assessment of awareness regarding obstetric and newborn danger signs among pregnant women and recently delivered mothers in urban slums of Raipur city, Chhattisgarh. Indian J Comm Health. 2019;31(1):104-111. doi:10.47203/IJCH.2019.v31i01.017
9. Haleema M, Raghuveer P, Kiran R, Mohammed IM, Mohammed IS, Mohammed M. Assessment of knowledge of obstetric danger signs among pregnant women attending a teaching hospital. J Family Med Prim Care. 2019;8(4):1422-6. doi:10.4103/jfmpc.jfmpc_149_19
10. Ahmad D, Mohanty I, Hazra A, Niyonsenga T. The knowledge of danger signs of obstetric complications among women in rural India: evaluating an integrated microfinance and health literacy program. BMC Pregnancy Childbirth. 2021;21(1):1-23. doi:10.1186/s12884-021-03563-5
11. Deshmukh N, Borkar A, Rathore M. Assessment of birth preparedness and complication readiness among pregnant women in rural area of Chhattisgarh: a community based cross-sectional study. Int J Community Med Public Health. 2019;6(4):1634-38. doi:10.18203/2394-6040.ijcmph20191397
12. Vijay NR, Kumare B, Yerlekar DS. Awareness of obstetric danger signs among pregnant women in tertiary care teaching hospital. J South Asian Feder Obst Gynae. 2015;7(3):171-175. doi:10.5005/jp-journals-10006-1350
13. Kaur A, Kaur M, Kaur R. Birth preparedness among antenatal mothers. Nurs Midwifery Res J. 2015;11(4):153-162. doi:10.1177/0974150X20150403
14. Nithya R, Dorairajan G, Chinnakali P. Do pregnant women know about danger signs of pregnancy and childbirth? A study of the level of knowledge and its associated factors from a tertiary care hospital in Southern India. Int J Adv Med Health Res. 2017;4(1):11-17. doi:https://doi.org/ 10.4103/IJAMR.IJAMR_68_16
15. Kiataphiwasu N, Kaewkiattikun K. Birth preparedness and complication readiness among pregnant women attending antenatal care at the Faculty of Medicine Vajira Hospital, Thailand. Int J Womens Health. 2018;10:797-804. doi:10.2147/IJWH.S185589
16. Ravish KS, Sagar S, Ranganath TS, Manjula K, Kumar IS. Birth preparedness and complication readiness for a safe motherhood among antenatal women attending an Urban Health Centre, Bengaluru. Nat J Res Community Med. 2017;6(4):319-325. doi:10.26727/NJRCM.2017.6.4.319-25
17. Telang BB, Kazi YK. Birth preparedness and complication readiness among antenatal women attending the maternity hospital in an urban slum of a metropolitan city. Indian J Appl Res. 2019;9(7):43-45. doi: https://www.doi.org/10.36106/ijar