



ORIGINAL RESEARCH PAPER

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BIRTH PREPAREDNESS AND COMPLICATION READINESS AMONG ANTENATAL CASES IN FIELD PRACTICE AREA OF RURAL HEALTH AND TRAINING CENTRE, MANGLIA

KEY WORDS: BPCR, antenatal care,

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ABSTRACT

Background: Maternal deaths contribute substantial burden on health in developing countries. Improving maternal mortality has received recognition at the global level as evidenced by the inclusion of reducing maternal mortality in the Millennium Development Goals. Evidence indicates that promoting Birth preparedness and complication readiness has important role in tackling maternal mortality.

Methods: A cross-sectional study was conducted from December 2013 to June 2014 in field practice area of rural health and training centre ,Manglia. . All the pregnant females ,attending the anganwadi and those seeking care at the training centre were subjected to pretested semi-structured BPCR questionnaire. Appropriate statistical analysis was done.

Results: The BPCR index was found to be 45.85.

Conclusion: Proportion of women who were well prepared for birth and ready for complications was still found to be low. Improving awareness of women and reinforcing counselling on obstetric Care was recommended to increase level of birth preparedness and complication readiness.

Objectives:

To find the prevalence of antenatal cases in the area.
To study the demographic profile of the study subjects.

To assess the birth preparedness and complication readiness among study subjects.

Introduction:

Maternal mortality is a substantial burden in developing countries.¹ Improving maternal mortality has received recognition at the global level as evidenced by the inclusion of reducing maternal mortality in the Millennium Development Goals.² The figures state that every five minutes one woman somewhere in India dies from pregnancy related complications amounting to 1 lac maternal deaths and 10 lacs newborn deaths each year.³ Various international experiences in maternal mortality reduction programme shows that every pregnant woman is at risk for life threatening complication and that safe delivery and access to EMoC(emergency obstetric care) are essential.^{4,5}In this context, birth preparedness is a comprehensive strategy to improve the use of skill providers at birth, the key intervention to decrease maternal mortality.⁶

Birth preparedness is a strategy to promote the timely use of skilled maternal and neonatal care, especially during childbirth, based on the theory that preparing for childbirth reduces delays⁷ Delays in deciding to seek care, reaching care and receiving care. The causes of these delays are common and predictable.⁷ A birth plan/emergency preparedness plan include identification of following elements: knowledge of danger signs, the desired place of birth, the preferred birth attendant, the location of the closest appropriate care facility, funds for birth-related and emergency expenses, a birth companion, support in looking after the home and children while the woman is away, transport to a health facility for the birth, transport in the case of an obstetric emergency, and identification of compatible blood donors in case of emergency.

MATERIAL AND METHODS:

Study Area - The present study was undertaken in the field practice area of Rural Health and Training centre, Mangliya, which is attached to the Department of Community Medicine, Shri Aurobindo Medical College and P G Institute, Indore.

Study Design - The present study is a cross sectional observational study, carried out for a period of one and half years from December 2013 to June 2015 while data collection was done for a period of first 6 months. All the pregnant females, attending the anganwadi and those seeking care at Rural Health and Training

centre, Mangliya were included in the study. Those pregnant females not attending anganwadi or Rural Health and Training centre, Mangliya during the study period were excluded from the study.

Sampling Technique and sample size - Rural Health and Training centre, Mangliya is 18 kilometers away from the Institute and is located at the west of Indore district, with population being 28,176 according to 2011 census. Considering birth rate as 19.6 of rural Indore it was estimated that there would be 553 antenatal cases.

Once the data was obtained, the calculations for point –in time estimates were done:

Calculation of pregnant females at a given point of time=
 $WRA \times (B \times Pb) + (A \times Pa) + (D \times Pd) / 1000$.

- WRA = Women of reproductive age group (15-49 years)
- B = Fertility rate (births) from the most recent year according to the census.
- A = Abortion rate
- D = Fetal loss rate (most recent national rate per 1000 women).
- P = Proportion of the year a woman is pregnant for each pregnancy outcome by month.
- Pb: 9m=0.75
- Pa: 2m=0.167
- Pd: 3m=0.25

As correct estimate of fetal losses is difficult to assess, so we calculation was done as under:

$$\begin{aligned} \text{Probable no. of pregnancies in an year} &= \{\text{population of the area} \times \\ &\text{birth rate of the area}\} \times 2.^8 \\ &= \{28,176 \times 19.6\} \times 2 \\ &= 553 \times 2 \end{aligned}$$

The appropriate sample size considering 10% foetal losses:
 $= [553 + 10\% \text{ of } 553] \times 2 = 608.3 \times 2$.

But as the data collection process was done for a span of 6 months so the final sample size will be 608 pregnant females, of this only 560 patients were found on survey and enrolled in the study and 13 forms being incomplete were later rejected, final sample size of 547 ANC was analyzed.

All the pregnant women who came at anganwadi and those who came at rural health and training centre Mangliya during the study

period were included in the study.all those who gave consent for the study were enrolled in the study rest all were excluded.

Method of data collection - There are 28 anganwadis in the field practice area of Mangliya and all the anganwadis were included in the study. For each anganwadi one day was fixed in a week when all the pregnant females were requested to be present for their antenatal visit. Anganwadi workers help was sought to inform all the pregnant females and were explained regarding the purpose of study and verbal consent was obtained before the interview. This was cross checked with the due list of pregnant females already made by anganwadi worker and ASHA and due care was taken to enroll greater no. of study subjects by conducting extra sessions during fixed immunization days. On these particular days the study subjects were interviewed using pilot tested predesigned semi-structured questionnaire which consisted of socio-demographic profile and questions related to birth preparedness and complication readiness.

Statistical Analysis - The recorded data was entered on MS Excel sheet. Percentages, Z-test and Chi square were applied for statistical analysis. The calculation of BPCR index was done taking into account 13 indicators, where presence of each indicator was awarded with 1 mark making maximum as 13 pointer scale of BPCR index. 2 indicators in the list are important for recently delivered woman hence 11 indicators are taken for calculation.⁹ After awarding 1 mark each, it is expressed in percentages and then mean of percentage is calculated. This is BPCR index.

Result:

table 1 illustrates socio demographic determinants ,where majority of pregnant females lie in age of 2-30 years (73.67%) while 139 lie in age under the age of 20 years constituting 25.41% of adolescent pregnancies. Of the total reservation by caste constitutes only 16.45%. while 79% of total have income according to class 3 and below. Table also shows education of mothers in completed years,in which 68(12.43%)were found to be illiterate and contrary to it percentage of working women was found to be 35.4%.

Table 2 showing distribution of BPCR indicators according to parity and literacy reveals that of the total 547, 223(40.76%) were primipara and the rest were multipara. Results of analysis by z test of 2 proportions figures out significant differences in knowing 1 key danger sign of pregnancy and essential new born care and also knowing about government cash incentive scheme.

Greater birth preparedness was found in multipara as registration within 12 weeks was done by 25.59% and 36.6%, ANC visits >4 was done by 15.1% and 23.0%, saving money for pregnancy and its complications was done by 37.66% and 52.1%, Identifying blood donor was done by 24.4% and 34.1%, Identifying transport was done by 37.29% and 51.9% of primi and multipara respectively. Z test of proportion was applied on all the above which was found to be insignificant.

Of the total 547, 219(40.03%) were illiterate and 328 (59.97%) were literate. Saving money for pregnancy ($Z=-7.07, p=0^*$), identifying blood donor ($Z=-2.92, p=0.0033^*$), Knowledge regarding 1 key danger sign of pregnancy ($Z=-14.39, p=0^*$), labor ($Z=-3.3, p=0.00012^*$), postpartum ($Z=-3.90, p=0.0001^*$) and knowledge regarding government cash scheme ($Z=1.91, p=0.049^*$) was found significant.

The table also shows that literate pregnant females had more birth preparedness. ANC visits >4 27.05% and 11.15%, preparation for institutional delivery was 42.04% and 28.70% of literate and illiterate pregnant females respectively. Z test of proportion was applied on all the above which was found insignificant.

In table 3 , 13 indicators contributing BPCR index are shown, 2 indicators were for recently delivered women, so 11 indicators were used for calculating BPCR index. One mark each was allotted to correct response, all correct responses were summed up and percentage was calculated. This value is BPCR index.

BPCR index=504.4/11
=45.85.

The BPCR index is 45.85 .The indicators that increase the value of BPCR index by greater proportion are identifying transport, as the roadways to Mangliya and its interior are not well developed, even near to delivery hubs, the situation is worse that is why the pregnant women are worried for their health and their delivery outcome, preparing for transport is an essential step.

Knowing government transport scheme JSY (Janani Suraksha Yojna) has become popular ,as the cost of delivery in private sector has risen, this scheme of incentives has turned their direction from private to government sector, small amount of incentives is at least a bit of relief postoperatively as said by recently delivered woman that she had been stressed due to decreased amount of liquor in the later months of pregnancy due to increased expenditure at private sector, during the time of delivery all her savings came to an end ,and was hardly left with anything ,in such a situation she had turn up to nearest PHC for getting delivered. Finally when she received a few hundreds, she could manage clothes and other accessories for her baby.

Authors' contribution:

At a point of time ANC patients found immunized with 2 doses of TT during first, second and third trimester were 23.52%,55.8%and 4.48% and 87(15.9%) pregnant females were found unimmunized at all giving rise to increased risk of neonatal tetanus.

Out of total 408(74.58%) took iron and folic acid tablets and 405(74.04%) took calcium tablets,525(95.97%) took adequate amount of sleep at night while only 182(33.27%) slept adequately during day time.

DISCUSSION

Age is a highly significant predictor of birth preparedness .As we see the percentage of adolescent and adult pregnancies, birth preparedness in every aspect is greater in adult pregnancies, with significant values in knowledge of key danger signs of pregnancy is obtained. No single respondent could innumerate all the key danger signs.

Besides, the odds of birth preparedness & complication readiness among knowledgeable women about key danger signs during pregnancy were nearly two times greater than not knowledgeable women (AOR=1.74, 95% CI=1.06,2.88). Similarly, the odds of birth preparedness and complication readiness among knowledgeable respondents about key danger signs during postpartum period were two times greater than those who lack knowledge about it (AOR=2.08, 95% CI=1.20,3.60).¹⁰

In the present study, around half of the women received their first ANC within 12 weeks of pregnancy, which is almost 10% higher than the corresponding figures reported in District Level Household and Facility Survey (DLHS)-3 for Uttar Dinajpur and West Bengal as well as National Family Health Survey (NFHS)-3 for West Bengal and India.^{11,12}

The corresponding figure in Rewa, India and north Ethiopia also was far less.^{8,14}

Mean age of respondents was 23.8 (± 0.28) years. Proportion of women who had their first ANC visit within first trimester, saved money, identified vehicle for emergency transport, and blood donor beforehand were 50.4%, 40.8%, 27.3%, and 9.6%, respectively. Around one-fourth (26.5%) were teenagers, the percentage of respondents aware of at least one key danger sign each of pregnancy, labor, postpartum, and newborn were 20.6%, 20.6%, 12.1%, and 37.2%, respectively The socio-demographic, individual, and health service-related factors under study did not have any significant association with participants' knowledge on key danger signs. Further, it was found that not a single respondent could enumerate all key danger signs of pregnancy, labor, postpartum, or newborn similar to our study.⁹ Multiparous females knew more about bpcr indicators than primipara

counterpart of same age ($Z = 2.38, P = 0.017$). Awareness on Government cash incentive and referral transport schemes was found among 63.7% and 38.6% respondents respectively.⁹

As evident from earlier research, pregnant women receiving four or more ANC visits were more likely to have skilled attendance at birth.^{15,16,17} However, only around one-third participants in the present study received four or more ANC visits. It was comparable with the figure noted in NFHS-3 for India, but far less than that of north Ethiopia and rural Uganda.^{60,61,24} Coverage of ≥ 3 ANC visits was better than the figures reported in DLHS-3 for Uttar Dinajpur and West Bengal as well as by Agarwal *et al.*^{39,58}

In this study, less than 50% women had institutional delivery, which is much higher than the corresponding figures noted in DLHS-3 report for Uttar Dinajpur and comparable with that of NFHS-3 report for West Bengal and India.^{11,12,18}

The linkage of monetary incentives like JSY and referral transport scheme might be the reason, especially in poor and marginalized section.¹⁹

Lack of liquid cash in resource constrained setting and availability of vehicle especially in remotest areas in emergencies are a major hindrance to access skilled care.^{20,21} Therefore, saving money to meet the cost of accessing skilled healthcare and arrangement of a vehicle for emergency transportation are two vital steps in BPCR as in our study.^{22,23}

Nearly 90% of the study population had saved money or identified a vehicle for transportation in emergency. Comparable proportion of women in Rewa saved money, but the figures were better in Indore and Burkina Faso.^{13,17,23,24}

Ethiopian figures in both the indicators were far less.¹⁴

Awareness of Government cash incentive was found to be high and that of referral transport schemes was poor, corroborating the findings of Kushwah *et al.*¹³

Knowledge of the danger signs of obstetric complications is the first step to seek timely care at appropriate health facility.²⁵ In the present study, proportion of women aware of at least one key danger sign each of pregnancy, labor, postpartum, and newborn ranged from as low as 12.1% to 37.2%, which indicated a dismal picture of health communication with the beneficiaries. Condition was far better in all other previous studies.^{7,14,17,24,26}

Identification of a blood donor for obstetric emergency did not seem to be an important issue to the respondents. The corresponding figures from north Ethiopia were far less, whereas that of Kenya was much better.^{14,23}

In our study we found that birth preparedness was better among general category in comparison to backward classes as is seen in many studies except Mukhopadhyay *et al* who found women of backward castes and BPL families were more likely to follow BPCR practices. Similarly awareness on availability of government schemes was more prevalent among women of backward castes, BPL families, and those with 5 or more years of education. This paradoxical finding of better picture among women of backward castes and BPL families might be linked to the availability of cash incentives.⁹

Educational status was the best predictor of awareness of birth preparedness ($P = 0.0029$), but not a good predictor of intention to attend four antenatal clinic sessions ($P = 0.449$)²⁷. Preparation for birth and its complication was higher among educated mothers (AOR=6.23, 95% CI=1.5, 25.87).^{10,28}

As reported in earlier studies, those having less than 5 years of education showed reluctance in it. Community practice and religious belief played crucial role in accessing formal care.⁹ women with primary education and above were twice more likely to be prepared and ready for birth and complications. Furthermore women who knew ≥ 3 obstetric danger signs were 3 times more likely to be prepared for birth and complications.²⁶

The States of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh, known as BIMARU States are lagging behind in performance level in comparison with the national average. Population growth in the BIMARU States continues to be high due to marriage at an early age, large size of population in the reproductive age group and high fertility rate. In view of this, it is important to study the utilization of ANC services by the pregnant women in these States.²⁹ tetanus toxoid - 1 = 85.7%, tetanus toxoid - 2/ booster = 77.5%, no tetanus toxoid=14.3%.²⁹

Receipt of antenatal services, such as 2 TT injections, 3 ANCs, and IFA tablets was not low, being 82%, 40.1%, and 86.2% respectively. However, only 28.5% of the mothers consumed IFA tablets for 3+ months during pregnancy.³⁹

CONCLUSION:

The prevalence of ANC cases in the study area was slight less(560) in comparison to expected(608).this might have happened due to lack of house to house visit.

The aim was to study the birth preparedness and complication readiness which was found to be good in terms of preparedness regarding saving money, arranging transport and knowing about governmental schemes, but awareness and knowledge about early registration and key danger signs is lacking for which increasing literacy status and conception in adult age is important.

With increasing age, knowledge regarding danger signs is found to increase. Avoiding pregnancy in adolescent age group can increase birth preparedness and also avoid complications and high risk pregnancies. With increase in literacy status knowledge regarding key danger signs, early registration and institutional delivery is found to increase. Working females have been found to be more cautious in saving money for pregnancy and complications and have better knowledge about key danger signs also. Hence, in the present study birth preparedness and complication readiness index is found to be 45.85%.Improving awareness of women and reinforcing counselling on obstetric danger signs on Antenatal Care is recommended to increase level of birth preparedness and complication readiness.

Table 1: table illustrating socio-demographic characteristics of antenatal study subjects:

Variable	Category	Frequency (%)
Age	<20 years	139(25.41%)
	20-30 years	403(73.67%)
	31-40 years	5(0.91%)
	41-49	0
Category	Reserved	90(16.45%)
	Unreserved	457(83.54%)
Formal education*of mother in completed yrs	Illiterate	68(12.43%)
	<5 years	151(27.60%)
	5-9 years	84(15.35%)
	10-12 years	206(37.65%)
	Undergraduate –graduate	34(6.2%)
	Graduate –postgraduate	4(0.73%)
Socioeconomic class*	Class 1 >5842	12 (2.19)
	Class 2 5841-2921	105(19.19)
	Class 3 1752-2920	222(40.58)
	Class 4 876.3-1751	174(31.80)
	Class 5 <876.3	34(6.2)
Parity	0	223(40.76%)
	1	224(40.95%)
	2	63(11.51%)
	3	31(5.66%)
	4	2(0.36%)
	5	3(0.54%)
	>5	1(0.18%)
Occupation of the mother	Housewife	353(64.6%)
	Working	194(35.4%)

*classified according to socioeconomic status scale of Kuppaswamy (1976) updated for June 2012.

Table showing distribution of BPCR indicators according to parity and literacy status.

(Z test of 2 proportions applied)

BPCR indicators	Primipara (n=223)	Multipara (n=324)	Z (p) value	Illiterate (n=219)	Literate (n=328)	Z (p) value
Registration < 12 weeks	90 (16.4)	116(21.2)	1.08 (0.28)	94 (17.1)	112 (20.4)	2.07 (0.03*)
ANC visits >4	83 (15.1)	126 (23.0)	-0.39 (0.69)	144 (26.3)	194 (35.46)	1.558 (0.11)
Institutional delivery	169 (30.8)	219 (40.0)	2.0735 (0.038*)	157 (28.7)	230 (42.04)	0.395 (0.69)
Saving money for pregnancy	206 (37.66)	285 (52.1)	1.6734 (0.094)	172 (31.44)	319 (58.31)	-7.07 (0*)
Identifying blood donor	134 (24.4)	187 (34.1)	0.554 (0.55)	112 (20.47)	209 (38.20)	-2.93 (0.003*)
Identifying transport	204 (37.29)	284 (51.9)	1.4173 (0.155)	172 (31.4)	316 (57.76)	0 (0*)
Knowing 1 key danger sign of pregnancy	31 (5.66)	75 (13.7)	-2.689 (0.007*)	28 (5.11)	248 (45.33)	-14.4 (0)*
Knowing 1 key danger sign of labor	27 (4.93)	52 (9.5)	-1.28 (0.197)	18 (3.2)	61 (11.15)	-3.4 (0.00012*)
Knowing 1 key danger sign of postpartum	22 (4.02)	25 (4.57)	0.88 (0.38)	6 (1.09)	40 (7.31)	-3.9 (0.0001)*
Knowing 1 key danger sign of new born	15 (2.7)	27 (4.9)	-0.69 (0.49)	15 (2.7)	24 (4.38)	0.39 (0.69)
Knowing 1 key component of essential new born care	46 (8.4)	40 (7.3)	2.6 (0.009*)	22 (4.02)	70 (12.79)	-3.5 (0.00054*)
Govt. cash incentive scheme	209 (38.2)	305 (55.7)	2.91 (0.004*)	211 (38.57)	303 (55.39)	1.9 (0.049*)
Govt. transport scheme	159 (29.1)	221 (40.4)	0.77 (0.441)	152 (27.7)	228 (41.68)	0.03 (0.9776)

*Significant at p<0.05, in parenthesis () percentages are expressed.

Table3: table showing BPCR variables contributing to BPCR index

BPCR VARIABLES	YES	NO
Registration < 12 weeks	206(37.6)	341(62.3)
ANC visits >4*	209(38.2)	338(61.8)
Institutional delivery*	387(70.2)	160(29.25)
Saving money for pregnancy	491(89.7)	56(10.23)
Identifying blood donor	321(58.6)	226(41.3)
Identifying transport	488(89.2)	59(10.78)
Knowing 1 key danger sign of pregnancy	106(19.3)	441(80.62)
Knowing 1 key danger sign of labor	79(14.4)	468(85.5)
Knowing 1 key danger sign of postpartum	47(8.59)	500(91.4)
Knowing 1 key danger sign of new born	42(7.67)	505(92.3)
Knowing 1 key component of essential new born care	86(15.7)	461(84.2)
Govt. cash incentive scheme	514(93.9)	33(6.03)
Govt. transport scheme	380(69.4)	167(30.53)

+Significant at p<0.05, in parenthesis () percentages are expressed.

*These indicators not taken in calculation for BPCR index, as are important for recently delivered women.

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