

Status of birth preparedness and complication readiness in a rural community: a study from West Bengal, India

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Abstract: *Problems:* Birth-preparedness and complication-readiness (BP/CR) is a tool to promote maternal and neonatal survival. This study was conducted to assess the perception and practices of recently delivered women on BP/CR with its correlates. *Methods:* In a cross-sectional, community-based study, 240 women who delivered in last 12 months, selected through two-stage 30-cluster sampling from a rural community in Bankura district, West Bengal, India were interviewed. *Result:* Overall BP/CR index of the study population was 49.4. Proportion of women who received first antenatal check-up within first trimester, four or more antenatal check-ups, saved money for childbirth and had institutional delivery were 83.8%, 87.9%, 84.6% and 90.0% respectively. Around one-sixth women had knowledge of key danger signs of obstetric complications and 12.9% identified blood donor. Working women and women of high-risk age group, Muslim religion, and lower educational status had lower BPCR index. Women with multiparity were less likely to have first check-up within 12 weeks, four antenatal check-ups and institutional delivery. *Conclusion:* Contacts with health system during service utilization can be used to promote BP/CR practices.

Keywords: Recently delivered women, birth preparedness, complication readiness, BPCR index.

Introduction

In order to achieve Millennium Development Goal-5, several interventions were undertaken under National Rural Health Mission to ensure access to skilled care at birth, emergency obstetric care for complications, financial assistance for availing antenatal and intranatal care including referral transport [1]. Besides this, the demand by women and the community for utilization of resources is equally important. Thaddeus and Maine have documented 'three delays' in seeking, reaching and obtaining appropriate care as the crucial factors for maternal mortality [2].

Birth-Preparedness and Complication-Readiness (BP/CR) is a package to empower women, her family and the community to promote maternal and neonatal survival. It has been recognized as a standard component of the programs designed to make pregnancy safer [3]. Two studies in rural and urban setting showed that Indian population is still struggling with the status of BP/CR

indicators [4-5]. In this background, the present study was conducted to assess the perception and practices regarding Birth Preparedness and Complication Readiness and to identify the related factors among women who delivered in last 12 months in a rural community of Bankura district of West Bengal, India.

Material and Methods

Study design, setting and subjects: A community-based, cross-sectional study was conducted during July-August 2011 in Bankura-1 Community Development Block of Bankura district covering a population of 1.06 lakhs spreading over 111 villages, among women who delivered in last 12 months. Considering the BP/CR index of 47.5 in the rural area of Rewa, Madhya Pradesh, 95% confidence level, 20% relative precision, design effect 2 and 10% non-response rate, the final sample size was 233 which was rounded off to 240 with cluster sample size of

eight in a 30-cluster survey [4]. From a list of villages of the block, 30 villages were selected through probability proportional to size sampling technique. In each village a list of women who delivered recently (in last 12 months) was prepared with the help of Accredited Social Health Activists and Anganwadi workers. Eight study subjects from each of these villages were selected through simple random sampling. Target women of the nearest village were included if the number of recently delivered women in the selected village was less than eight.

Methods of data collection: After obtaining informed consent, socio-demographic information like age in completed years, caste, religion, duration of formal education, occupation, and parity was collected with a semi-structured questionnaire at their household. Age was categorized in two groups: high risk group composed of women with age less than 20 years or more than 35 years and low risk group which included women of age group 20-35 years. Duration of formal education was divided in two groups: no/ upto primary and post-primary.

Perception and practices regarding Birth Preparedness and Complication Readiness of recently delivered women were assessed with the help of a pilot-tested, semi-structured questionnaire. For the purpose of the study, a medically qualified provider with midwifery skills (midwife, nurse or doctor) who has been trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage or refer obstetric complications, was considered as a skilled birth attendant (SBA) [6].

Severe vaginal bleeding, swollen hands/face and blurred vision were considered as key danger signs of pregnancy. Severe vaginal bleeding, prolonged labor, convulsions and retained placenta were considered as key danger signs of labor/ childbirth [3]. Severe vaginal bleeding, foul smelling vaginal discharge and high fever during first seven days after childbirth were considered as key danger signs of post-partum period [3]. Key danger signs of neonates were convulsion, difficult/fast breathing, very small baby, lethargy/unconsciousness and not able to suck/drink during first seven days of life [3]. Exclusive breastfeeding, keeping the baby dry and warm, care of cord and care of eyes were

considered as four key components of essential newborn care [3].

Data analysis: To measure birth preparedness and complication readiness among recently delivered women a set of indicators, expressed in percentages of women having specific attributes, have been identified in a number of earlier studies [3-5]. Ten such indicators were chosen in the present study to construct BPCR index (Box No. 1) which was unweighted average of ten indicators and expressed as a score out of hundred [3-4]. Such a scoring was found to be useful for monitoring of the situation over time as well for comparing with other area. Bivariate analysis was done to examine association of BP/CR indicators and index with socio-demographic variables of study subjects.

Box-1: Indicators constructing BPCR Index	
No.	Description
1	Percentage of women received first antenatal check-up within first trimester
2	Percentage of women received 4 ANC's
3	Percentage of women delivered with SBA
4	Percentage of women saved money for childbirth
5	Percentage of women identified vehicle for emergency transportation
6	Percentage of women identified blood donor
7	Percentage of women knew key danger signs of pregnancy
8	Percentage of women knew key danger signs of labor/ childbirth
9	Percentage of women knew key danger signs of post-partum period
10	Percentage of women knew key danger signs of newborn

Knowledge about essential newborn care, community financial scheme (*Janani Suraksha Yojana*) and community transport scheme (referral transport scheme/ *Matri-Yan*) among recently delivered women were also assessed and expressed in percentages.

Ethics: The study proposal was cleared by the Institutional Ethics Committee of Bankura Sammilani Medical College, Bankura.

Results

A total of 240 married women who delivered in last 12 months were interviewed. Mean age of the mothers was 23.2 years (± 3.4), and teenage mother was 8.8%. Among the study subjects,

38.8% were illiterate, more than half (56.3%) belonged to backward classes (scheduled castes/ tribes and other backward classes), majority (85.0%) were Hindu and 12.1% were working mothers (Table-1).

Table-1: Distribution of indicators constructing BP/CR index according to socio-demographic variables (n=240)

Variables	Category	n	Indicators No.†										BP/ CR index
			1	2	3	4	5	6	7	8	9	10	
Age group	High risk	25	84.0	92.0	92.0	88.0	64.0	4.0	16.0	8.0	8.0	8.0	46.4
	Low risk	215	83.7	87.4	89.8	84.2	71.2	14.0	19.1	14.9	18.6	14.4	49.7
Religion	Hindu	204	81.9	90.2	90.7	85.3	70.6	12.7	18.1	13.7	18.6	14.2	49.6
	Muslim	36	94.4	75.0*	86.1	80.6	69.4	13.9	22.2	16.7	11.1	11.1	48.1
Caste	General	105	88.6	82.9	94.3	81.0	63.8	15.2	18.1	18.1	16.2	16.2	49.4
	SC/ ST/ OBC	135	80.6	91.9	86.7	87.4	75.6	11.1	19.3	11.1	18.5	11.9	49.4
Education	No/ Primary	124	83.9	90.3	86.3	82.3	73.4	11.3	16.1	10.5	13.7	7.3	47.5
	Post-primary	116	83.6	85.3	94.0	87.1	67.2	14.7	21.6	18.1	21.6	20.7	51.4
Occupation	Housewife	211	86.3	88.2	90.5	83.4	71.1	12.3	20.4	15.2	18.0	13.7	49.9
	Working	29	65.5**	86.2	86.2	93.1	65.5	17.2	6.9	6.9	13.8	13.8	45.5
Parity	Primi	111	85.6	90.1	95.5	81.1	67.9	10.8	15.3	12.6	13.5	15.3	48.8
	Multi	129	82.2	86.0	85.3*	87.6	72.9	14.7	21.7	15.5	20.9	12.4	49.9
Total		240	83.8	87.9	90.0	84.6	70.4	12.9	18.8	14.2	17.5	13.8	49.4
	SD		6.7	4.7	3.6	3.7	3.8	3.3	4.2	3.7	4.1	3.6	1.7

* = p < 0.05; ** = p < 0.01; † As written in Box-1

BP/ CR Index, component Indicators and socio-demographic variables (table-1): As shown in table-1, proportion of recently delivered women who had their first antenatal visit within first trimester, received four or more antenatal check-ups, delivered with a SBA, saved money, identified a vehicle for transportation in emergency and identified a blood donor were 83.8% (± 6.7), 87.9% (± 4.7), 90.0% (± 3.6), 84.6% (± 3.7), 70.4% (± 3.8) and 12.9% (± 3.3) respectively. All deliveries with SBA in the present study took place at health institutions.

Three key danger signs of pregnancy were known to 18.8% (± 4.2) participants, whereas 75% knew at least one key danger sign. All four key danger signs of labor and childbirth were known to 14.2% (± 3.7) respondents whereas 60.0% were found to be aware about at least one key danger sign. Three out of five mothers were aware of at least one key danger sign of post-partum period whereas three danger signs were known to 17.5% (4.1) study women. Around three-fourth (73.3%) study subject knew about at least one key danger sign of neonates, whereas five key danger signs were known to 13.8% (± 3.6) women.

BP/ CR index of the study population was 49.4 (± 1.7). It was found to be higher among women of low risk age (49.7 vs. 46.4), Hindu families (49.6 vs. 48.1), as well as women with post-primary education (51.4 vs. 47.5), housewives (49.9 vs. 45.5) and multipara (49.9 vs. 48.8) than their counter parts, though the differences were not significant ($p > 0.05$). Women of general caste and SC/ST/OBC had similar BPCR index (49.4). Women of high risk age group and primipara lagged behind a lot in knowledge on danger signs of obstetric complications and in identifying blood donor than their counterparts. Women of SC/ ST/ OBC showed higher propensity for receiving four or more antenatal check-ups than women belonging to general castes whereas higher proportion of working women saved money than that of housewives.

Awareness of community financial support system for pregnancy: Although the name of community financing scheme i.e. *Janani Suraksha Yojana* was not known to majority of respondents, 90.4% (± 3.4) study women were aware of cash incentives during

pregnancy and after institutional delivery. Awareness about the scheme was more among women belonging to highrisk age-group, Hindu, SC/ST/OBC as well as women with multiparity, post-primary education and working women. (Table-2)

Awareness of community transport system for labor/emergency: Table-2 revealed that almost 78.3% (± 8.1) study women were aware of the community transport scheme for pregnant women although a few knew the name. The proportion is higher among high-risk age-group, Hindu and SC/ST/OBC as well as among women with multiparity, post-primary education and housewives.

Essential newborn care: About one-fifth women knew all four components of Essential Newborn Care, whereas another 74.6% knew at least one component of Essential Newborn Care. 5.0% respondents knew nothing about essential newborn care. The proportion of women knowing all 4 components of Essential Newborn Care was higher among primipara, Muslims, women of SC/ST/OBC, low-risk age group, having upto-primary education and working women than their counterparts (Table-2).

Characteristics	Category	n	% of women aware of		
			Community financial scheme	Community transport scheme	Essential Newborn Care
Age group	High risk	25	96.0	84.0	8.0
	Low risk	215	89.8	77.7	21.9
Religion	Hindu	204	90.7	82.4	19.6
	Muslim	36	88.9	55.6**	25.0
Caste	General	105	83.8	70.5	19.0
	SC/ ST/ OBC	135	95.6**	84.4*	21.5
Education	No/primary education	124	90.3	73.4	21.0
	Post-primary education	116	90.5	83.6	19.8
Occupation	Housewife	211	90.0	79.1	19.9
	Working	29	93.1	72.4	24.1
Parity	Primi	111	87.4	77.5	21.6
	Multi	129	93.0	79.1	19.4
Total		240	90.4 (± 3.4)†	78.3 (± 8.1)†	20.4 (± 4.2)†

* = p < 0.05; ** = p < 0.01; † figures within parenthesis indicate SD

Discussion

For long time, several indicators have been used to measure different facets of preparedness for child birth and emergency arising out of it. However, a summary index, consisting of all relevant indicators could effectively depict the

overall picture of birth preparedness and complication readiness [3]. The present study revealed a BP/ CR index score of almost 50. There were gross differences between perception and practice indicators at individual level of recently delivered women.

As evident from earlier research, pregnant women receiving their first check-up within first trimester and four or more antenatal check-ups were more likely to have favorable outcome [6-7]. In the present study, BP/ CR indicators like first check-up within first trimester, at least four antenatal check-ups, institutional delivery crossed the benchmarks of 80% among recently delivered women. The corresponding figures reported in DLHS-3 for Bankura as well as findings in Indore and Nigeria were far less [5, 8-9]. National and state level figures as reported in National family Health Survey (NFHS-3) were also low compared to present study [10-11]. Utilization of antenatal care services in rural Karnataka and Rajasthan were also found to be very low [12-13]. The linkage of monetary incentives like JSY and referral transport scheme with utilization of antenatal and intra-natal services might be the reason, especially among poor and marginalized women.

Lack of liquid cash in resource constrained setting in emergencies is a major hindrance to access skilled care and so is the availability of vehicle especially in remotest areas [14-15]. Therefore, saving money to meet the cost of accessing skilled health care and arrangement of a vehicle for emergency transportation are two vital steps in BP/CR [3, 15]. Majority of the participants in this study saved money, identified vehicle for transportation in emergency as well as aware of community financing and transport schemes. Comparable proportion of women in Indore and Burkina Faso saved money but identifying vehicle beforehand was less practiced [5, 16]. In Madhya Pradesh, a comparable proportion of women identified vehicle but less than half of the study participants saved money [4]. Ethiopian figures in both the indicators were far less [17].

Knowledge of the danger signs of obstetric complications is the first step to seek timely care at appropriate health facility [3, 14]. Slightly more than one-third women in both West Bengal and India received information from health care providers on danger signs of obstetric complications [10-11]. In the present study, around one-sixth women were aware of key danger signs of pregnancy, labor/childbirth, postpartum and neonatal period, which indicated

low awareness at the individual level. In spite of higher utilization of health care services, these findings may be attributed to lack of birth preparedness activities by the service providers during antenatal check-ups. Low proportions of women with desired level of knowledge on danger signs were also comparable in urban India and Ethiopia [5, 17].

Identification of a blood donor for obstetric emergency was not perceived as an important issue in the present study, still better than that of north Ethiopia [17]. It was noted that women who were more vulnerable to obstetric complications e.g. high-risk age group, multipara, as well as marginalized group like Muslims and SC/ST/OBC, showed reluctance in following BP/CR practices. Similar findings were noted across the globe [4-5, 9, 11, 14]. Working women also had low BP/CR index. These findings emphasize the need of focused attention. The low BP/CR index among study population was mainly contributed by lower level of knowledge on danger signs of pregnancy, labor/childbirth, post-partum and neonates, masking the effects of other practice indicators. It underscores the missed opportunity of health system to promote complication readiness among beneficiaries in spite of repeated contacts from early phase of antenatal period. Lower proportion of women having knowledge of key components of essential newborn care and identifying a blood donor also supported the assertion.

Conclusion

The present study emphasizes the need of motivating the health worker to utilize every contact with the beneficiaries and making them equipped with the concept of 'focused antenatal care' in order to empower women and their family to take decision, plan and implement BP/CR practices.

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