Birth Preparedness and Complication Readiness (BP/CR) among antenatal women attending an Urban Primary Health Centre, Chennai - a cross sectional study

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Abstract

Background and Objectives:

BPCR is a strategy to encourage timely use of skilled maternal and neonatal care during childbirth. The World Health Organization states that BPCR should be a significant part of focused antenatal care. Despite being one of the high performing states for maternal-child health, Tamil Nadu still faces difficulties in further reducing MMR and Perinatal mortality. Exploring the key factors associated with BPCR would be of great use in evidence-based fine-tuning of ongoing maternal and child health interventions to minimize the complications and avert maternal deaths in Tamil Nadu. Therefore, this study aimed to assess BPCR practices and the factors associated with them among the antenatal women attending an Urban Primary Health Centre in Chennai.

Methodology:

This cross-sectional study was done during December 2022-January 2023 among 135 antenatal mothers at **Pulianthope** UPHC. Systematic random sampling was done and a pretested, prevalidated, semi-structured questionnaire comprising demographic details and components of BPCR was adopted from "Monitoring Birth Preparedness and Complication Readiness, Tools and Indicators for Maternal and Newborn Health (JHPIEGO)" – Individual level. The data was entered in MS Excel and analyzed using SPSS Version 16. Chi-square test was used to determine the statistical significance.

Results:

Among 135 Participants mean age was 23.54 ± 2.6 years. 57% were degree holders. 16.3% were employed. 42.2% belonged to middle class. 25.2% had pregnancy complication, 68.9% had more than 4 AN visit and 62.2% were in third trimester of pregnancy. overall awareness of danger signs was 31.1%. The birth preparedness among primigravida mothers in the component of choosing delivery place, ready with the transport in emergency, saved money for delivery and ready with blood donor were 84.4%, 77.8%, 28.1% and 51.1% respectively. BP/CR Index was found to be 61.67%. Employment, socioeconomic class, trimester and number of AN visit influenced both awareness of danger signs and birth preparedness

Conclusion:

Awareness of maternal danger signs was low and the birth preparedness level was average, suggesting that during antenatal contact, more emphasis should be placed on the quality of information provided to expectant mothers regarding BP/CR and awareness of danger signs.

Keywords- Birth preparedness, Complication readiness, Danger signs in pregnancy

Introduction

When a child is born, the mother is also born. During pregnancy, childbirth, and the postpartum period, women and newborns need prompt access to skilled care. Too frequently, delays in seeking, getting to, and receiving care limit their access to care.[1]

Around 810 women worldwide pass away every day from complications related to pregnancy or childbirth,and 94% of all maternal deaths occur in low and lower middle-income countries.The MMR target set forth in the SDG is to be reduced to 70 per 100 000 live births worldwide by 2030.(2) In order to bring down MMR, India must make certain changes that will speed up the decline in maternal mortality beyond what was seen during the MDG era. Additionally, new approaches that bridge the gaps in the health system with the efforts of civil society must be adopted. (3)

Three delays that affect the course of any pregnancy were identified by Thaddeus and Maine. They assert that delays can happen on three different levels, including those related to the decision to seek care, getting to the right facility, and receiving quality care there. The causes of the initial delay may include late problem recognition, ignorance, hospital fear, a lack of resources, or the absence of a decision-maker. The second delay is frequently brought on by transportation challenges, a great distance from a healthcare facility, and numerous referrals, while the third delay is frequently brought on by challenges in obtaining blood supplies, equipment, and an operating room. (4)

One of the most logical and conceptually appealing ways to address these delays is through birth preparedness and complication readiness (BPCR). BPCR is a strategy to encourage timely use of skilled maternal and neonatal care during childbirth. The World Health Organization states that BPCR should be a significant part of focused antenatal care. (5)

In order to measure the BPCR at six different levels—the individual woman, her family (husband/partner), the community, the healthcare provider, the health facility, and the

policy environment—JHPIEGO (an affiliate of Johns Hopkins University, USA) has developed a set of indices (6).

Despite being one of the high performing states for maternal-child health, Tamil Nadu still faces difficulties in further reducing MMR and Perinatal mortality. Exploring the key factors associated with BPCR would be of great use in evidence-based fine-tuning of ongoing maternal and child health interventions to minimize the complications and avert maternal deaths in Tamil Nadu. Therefore, this study was aimed to assess the BPCR practices and the factors associated with it among the antenatal woman attending Urban Primary Health Centre, Chennai.

Objective

1. To Assess the Birth preparedness and Complication readiness among antenatal women attending Pulianthope Urban Primary Health Centre and Socio demographic factors influencing it.

Review of literature

One of the most logical and conceptually appealing ways to address the three delays that influence the outcome of pregnancy is through birth preparedness and complication readiness (BPCR). BPCR involves creating an environment that is conducive to maternal and newborn survival as well as preparing for emergency situations. The idea of BPCR entails being aware of potential danger signs, making arrangements for a birth attendant and birth site, arranging transportation, locating a blood donor, and putting money aside in case of an obstetric emergency. (7) Studies have shown that, even in low-resource settings, BPCR interventions are effective in reducing maternal and neonatal mortality with adequate population coverage.

The evaluation of knowledge regarding pregnancy danger signs is one of the main elements of BPCR. Identification of obstetric complications as soon as possible is crucial for prompt referral services as well as for seeking medical attention. (9) In study by Acharya et al. overall level of awareness regarding danger signs of pregnancy was very low (27.8%), followed by poor knowledge of danger

signs of labor (6.7%), whereas only three women (0.7%) knew about danger signs during puerperium. (10)

A summary index, consisting of all relevant indicators could effectively depict the overall picture of birth preparedness and complication readiness called the BPCR index.BPCR index was found to be 50% in study by Mazumdar et al in west Bengal (11) and 36.5% in study by chandarkar et al. in Chhattisgarh. (12)

According to Mutiso et al. compared to uneducated women, educated women have better pregnancy outcomes because of better health information and are more likely to make wise decisions, create and carry out birth plans, and have the social or financial power to act decisively in the event of obstetric emergencies. (13)
In study by Akshaya et al. in Karnataka percentage of the women practiced the key components of BPCR: identified the place of delivery (100%), saved money to pay for expenses (52.2%), identified the mode of transport to the place of childbirth (71.7%), identified a birth companion (90.8%) and arranged a blood donor if the need arises (15.8%). (14)

Chandarkar et al strongly suggested that women attending first ANC visit within the first trimester usually have better pregnancy outcome and those who had more than 4 AN check-up had better birth preparedness. (15)

Akshaya et al. concluded that imparting adequate knowledge about key danger signs and stressing the importance of BPCR are needed. In this context, the role of ANM and ASHA is critical. Involving the family members while discussing key danger signs and BPCR will further enhance the implementation.(14)

Methodology:

Study area and study period:

This cross-sectional study was done at **Pulianthope** UPHC. The study was done during December 2022 - January 2023.

Study population, Sample size and sampling technique

The study population was Primigravida mothers who had completed 12 weeks of Gestational age and attended Pulianthope Urban Primary Health Centre, Outpatient department(OPD).

The sample size was calculated using the formula, $n= Z^2 \times pq / d^2$, using the prevalence of 45% taken from previous study (16) and absolute precision of 5%, with 10% non-response rate and the sample size was calculated as 135.

Ethical approval and scientific committee were obtained from the Institutional Ethical Committee and scientific committee of Madras Medical College respectively.

Systematic random sampling was done in Antenatal women attending Pulianthope Urban PHC for regular checkup was selected with the sampling interval of 3.

Study tool and Data collection

A pretested, prevalidated, semi-structured questionnaire comprising demographic details and components of birth preparedness & complication readiness was adopted from "Monitoring Birth Preparedness and Complication Readiness, Tools and Indicators for Maternal and Newborn Health (JHPIEGO)" – Individual-level(8). Data collection was done by face-to-face interview technique.

Operational definition

Birth preparedness and complication readiness (BP/CR) Index:

The average of the following components enlisted in the table-1 is called BP/CR Index(4).

S.No	BP/CR Components
1.	% of women knew any existing govt. financial scheme. (MRMBS,JSY)
2.	% of women knew at least one key danger signs of pregnancy
3.	% of women knew at least one key danger signs of childbirth
4.	% of women knew at least one key danger signs of post partum period

5.	% of women knew at least one key danger sign of newborn
6.	% of women who (plan to) saved money for childbirth
7.	% of women who (plan to) identified vehicle for emergency transportation
8.	% of women who knew about government ambulance services
9.	% of women who (plan to) identified blood donor
10.	% of women who identified place of delivery
11.	% of women who knew about government blood services

Awareness of maternal danger signs:

If a participant was able to specify atleast one key danger signs in all the phases of antenatal, labor and postnatal period was considered as aware.

Birth preparedness:

If a pregnant woman have planned three components out of four in the following, she was considered as being "well prepared" and the rest were considered "not prepared" i) identified place for childbirth; ii) identified blood donor; iii) saved money for child-birth and iv) arranged transport in case of delivery and obstetric emergency.

Data Analysis

The data was entered in MS Excel and analyzed using SPSS Version 16.

- Descriptive statistics are expressed as Percentages.
- A Chi-square test was used to determine the statistical significance.

Results

Socio-Demographic Details

Total study participants were 135 primigravida antenatal mothers whose mean age in years was 23.54 ± 2.6 with minimum age being 19 years and maximum being 35 years.

Table1: Socio-Demographic factors

FACTORS		**FREQUENCY N=135**	**PERCENTAGE**
Education	Degree holder	77	57%
	No degree	58	43%
Job	Employed	22	16.3%
	Un-employed	113	83.7%
Type of Family	Joint family	40	29.6%
	Nuclear family	95	70.4%
Socio-Economic status	Lower class	3	2.2%
	Lower middle	7	5.2%
	Middle	57	42.2%
	Upper Middle	36	26.7%
	Upper class	32	23.7%

Among the 135 participants 57% had a degree but only 16.3% was employed, 70.4% lived in a nuclear family and the majority 42.2% belonged to middle class.

Obstetric details:

Among the participants 25.2% had pregnancy related complication, 68.9% had more than 4 antenatal visits and 62.2% were in their third trimester.

Table 2 Obstetric details of the participants

Variables		Frequency (percentage) n=135
Pregnancy Related Complications	Yes	34(25.2%)
	No	101(74.8%)
Antenatal Visits	Less than 4 visits	42 (31.1%)
	More than 4 visits	93(68.9%)
Trimester	2nd Trimester	51(37.8%)
	3rd Trimester	84(62.2%)

Awareness of danger signs:

Those who were aware of any one danger sign in all phases was only 31.1%. Awareness of danger sign during pregnancy was 68.10% and awareness of danger sign during postpartum was 33.30% as in fig1.

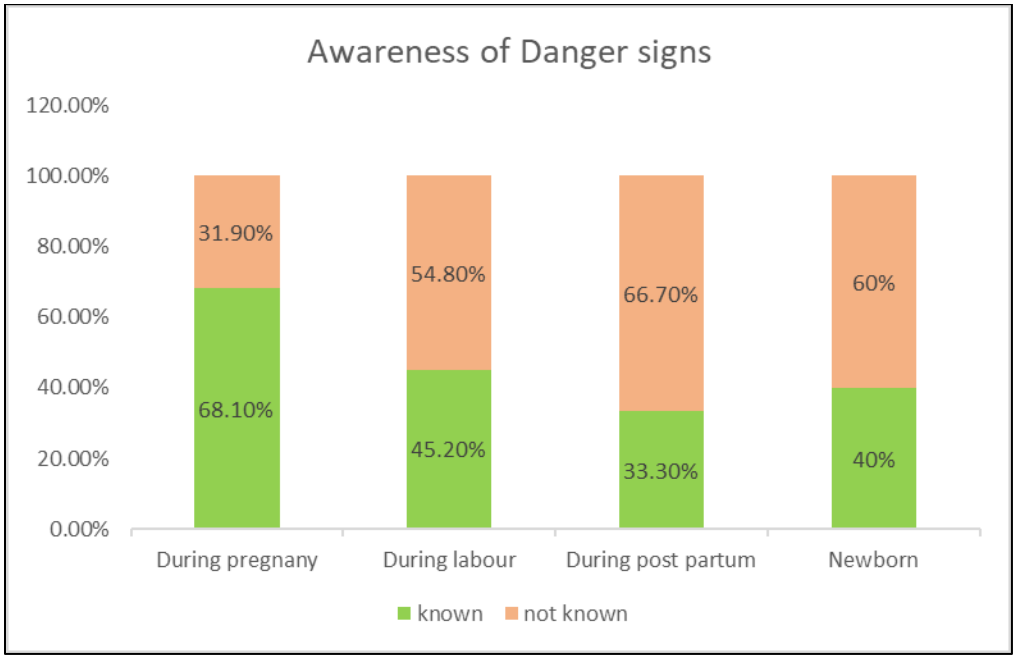

Fig 1: Awareness of danger signs in various phases

Birth preparedness

Among 135 participants 75(55.6%) had birth preparedness. The birth preparedness among primi mothers in the component of choosing delivery place, ready with the transport in emergency, saved money for delivery and ready with blood donor were 84.4%, 77.8%, 28.1% and 51.1% respectively.

Table 3-components of Birth preparedness

Birth preparedness	Frequency (n=135)	Percentage
Decided delivery place	114	84.4%
Money saved	38	28.1%
Transport identified	105	77.8%
Blood donor identified	69	51.1%

BP/CR Index in antenatal mothers was found to be 61.67%

Table 4-components of Birth preparedness and complication readiness

S.No	BP/CR Components	%
1.	% of women knew any existing govt. financial scheme. (MRMBS,JSY)	88.9
2.	% of women knew at least one key danger signs of pregnancy	68.1
3.	% of women knew at least one key danger signs of childbirth	45.2
4.	% of women knew at least one key danger signs of post partum period	33.3
5.	% of women knew at least one key danger sign of newborn	40
6.	% of women who (plan to) saved money for childbirth	28.1
7.	% of women who (plan to) identified vehicle for emergency transportation	77.8

8.	% of women who knew about government ambulance services	96.3
9.	% of women who (plan to) identified blood donor	51.1
10.	% of women who identified place of delivery	84.4
11.	% of women who knew about government blood services	65.2

Associations

The participants who were aware of danger signs had better birth preparedness (81%) than those who were unaware of the danger signs in all phases and the difference was statistically significant

Table 5 Association between Awareness of danger signs & Birth preparedness

		Birth preparedness		Odds ratio	P value
		Prepared	Not prepared		
Awareness of danger signs	Aware	34(81%)	8(19%)	5.3 (2.25-12.89)	**<0.001***
	Unaware	41(44.1%)	52(55.9%)		

Education level did not show a significant association with awareness of danger sign and BPCR. The participants who were employed had a statistically significant higher awareness in maternal danger signs (68.2%) and high level of birth preparedness (81.8%). The participants those who were from nuclear family had higher awareness in maternal danger signs (36.8%) and was statistically significant.The mothers who belong to upper socioeconomic class had better awareness (41.2%) and preparedness

The Primi mothers in their 3rd trimester and mothers who had more than 4 AN visit had higher awareness and birth preparedness which was statistically significant. Presence of pregnancy complication had no statistically significant difference in both awareness of danger signs and birth preparedness

Table 6 Association between Awareness of danger signs & Birth preparedness

VARIABLES		Awareness of Maternal danger Sign			Birth preparedness		
		Aware	Unaware	P value	Prepared	Not prepared	P value
Job	Employed	15(68.2%)	7(31.8%)	**<0.001**	18(81..8%)	4(18.2%)	**0.007**
	Un-employed	27(23.9%)	86(76.1%)		57(50.4%)	18(81.8%)	
Type of Family	Joint family	7 (17.5%)	33(82.5%)	**0.02**	18(47.4%)	20(52.6%)	0.241
	Nuclear family	35(36.8%)	60(63.2%)		55(57.9%)	40(42.1%)	
Socio-Economic status	Lower class	14(20.9%)	53(79.1%)	**0.011**	35(52.2%)	32(47.8%)	**0.441**
	Upper class	28(41.2%)	40(58.8%)		40(58.8%)	28(41.2%)	
Trimester	Second	4(7.8%)	47(92.2%)	**<0.001**	16(31.4%)	35(68.6%)	**<0.001**
	Third	38(45.2%)	46(54.8%)		59(70.2%)	25(29.8%)	
Pregnancy complication	Present	10(29.4%)	24(70.6%)	0.805	19(55.9%)	15(44.1%)	0.965
	Absent	32(31.7%)	69(68.3%)		56(55.5%)	45(44.6%)	
AN Visit	Less than 4	0(0%)	42(100%)	**<0.001**	12(28.6%)	30(71.4%)	**<0.001**
	More than 4	42(45.2%)	51(54.8%)		63(67.7%)	30(32.3%)	

Discussion

This was a cross-sectional study done among antenatal women attending regular check-up at urban primary health centre, Chennai to assess birth preparedness and complication readiness and the sociodemographic factors influencing them.

Composite awareness of danger signs during the period of Antenatal, labour, Postnatal (atleast one in each phase) in this study was 33.30%which was comparable to study conducted by Bhilwar et al in Delhi where awareness was 30% (17) In another study by Chandran et al in Karnataka the overall knowledge of danger signs was found to be 18%. (18)

Awareness of danger sign during pregnancy, labour , postpartum and new-born period was 68.10%, 45.2%, 33.3% and 40% respectively which was high compared to study by Mukhopadhyay et al in west Bengal in which 42.0%, 32.7%, 30.1%, and 45.4% of respondents were aware of at least one key danger sign each of pregnancy, labor, postpartum and newborn. (1)

Among the 135 participants 75(55.6%) had birth preparedness which was high compared to study by Agarwal et al in Indore (47.8%) this Relatively high Birth preparedness in the present study could be due to high female literacy, better knowledge of danger signs, higher service utilization, and a higher proportion of institutional deliveries in the study district. (19)

Majority (84.4%) had identified a place for delivery and 77.8% identified a mode of transportation for the delivery. Nearly half of the women (51.1%) had identified blood donor but only 28.1% saved money for delivery this may be due to the socioeconomic condition of the mothers who attended urban primary health centre.

The observed BPCR practice in our study is 61.67% higher than the other Indian studies. Bhilwar et al in Delhi where BPCR index was 37.12% (8), Mazumdar et al in west bengal concluded BPCR index was 49.4 % (10) and Chandarkar et al revealed that the BPCR index of pregnant women was 34.1% (15)

These variations could be due to education and occupation, knowledge of key danger signs, preference to institutional delivery.

The current study found that those who were aware of maternal danger signs were better prepared for birth; the odds of being prepared for birth were 5.3 (2.25 -12.89) times higher and statistically significant, with a p value of <0.001. Similar outcomes were also obtained by Akshaya et al. in Karnataka and the odds was 5. (2.2 -11.8). (14)

The significant influence of woman's literacy level on BPCR practice is highlighted by many studies from India but in our study (10,14) education level did not show a significant association with BPCR. This could be attributed to overall high literacy rate in this study population.Similar to study by Pervin et al and Bhilwar et al , in the current study there was significant association of BPCR with socio economic status.(17,20)

Those who had more than 4 AN visit had significant difference in awareness of danger signs and BPCR like in study by Agarwal et al in Indore. (19) Women who received ANCs possibly also received some form of counselling on BPCR and, hence, were more likely to have better birth preparedness .

Conclusion

According to this study, awareness of atleast one danger sign across all phases was low (31.1%) and birth preparedness was medium (55.6%) and there was significant association between the awareness of maternal danger signs with the birth preparedness. BPCR index was found to be 61.67%. The highest level of awareness in maternal danger signs and birth preparedness were noted in the participants who were employed, upper socio-economic class, those who had more than 4 antenatal visits and also in their 3rd trimester.

Recommendation

During antenatal visits, more emphasis should be placed on the quality of information provided to expectant mothers regarding BP/CR and awareness of danger signs. Socioeconomic disparities further suggest the need for improvements in the accessibility and quality of care to low-income populations

Limitation

Facility based study sample may not exactly represent the pregnant women in the community. Also, this study was done in the urban Primary health centre, field practice area of the Institute of Community Medicine, Madras Medical college. So, it may not be generalizable to other antenatal mothers.

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