

Assessment of Birth Preparedness and Complication Readiness among Postnatal Mothers in Tertiary Care Hospital, West Bengal

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ABSTRACT

Introduction: Maternal mortality still remains a major public health challenge in India. Delays in seeking, reaching and obtaining to appropriate intranatal care are the crucial factors determining maternal mortality. Birth Preparedness and Complication Readiness (BPACR) is the process of planning for normal birth and anticipating the actions needed in case of an emergency. It is a logical process of addressing delays in delivery.

Aim: To assess BPACR status of postnatal mothers using BPACR index and to determine association between socio-demographic and other variables and BPACR status among them.

Materials and Methods: The cross-sectional, observational study was conducted on 200 postnatal mothers of Indoor Patient Department (IPD), Department of Gynaecology and Obstetrics, in a tertiary care hospital in West Bengal. Socio-demographic information and information on antenatal history, decision makers during pregnancy, type and distance of nearest health facility, knowledge of danger signs, identification of the skilled birth attendant, mode of transport, arrangement for money and other variables were collected by interviewing the patients with a predesigned, pretested, semi structured schedule and by reviewing records. BPACR is the process of planning for normal birth and anticipated actions needed during an emergency. To assess BPACR status among postnatal women, BPACR index

is measured which consists of a set of indicators. Data were analysed using Statistical Package for the Social Sciences (SPSS) version 20.0. Proportion and Chi-square test were used wherever applicable. The p-value of less than 0.05 was taken as statistically significant.

Results: The final BPACR index was 61.07. All participants identified skilled birth attendants for delivery. Almost all were aware of Janani Suraksha Yojana (JSY). Among 200 women, about 90% of them had knowledge about transportation services provided by the government. Only 63.5% of the mothers (127/200) availed Antenatal Care (ANC) by skilled provider. About 38.5% (77/200) of study participants identified the mode of transportation, and 38% (76/200) of them saved money for delivery expenses. No participant could identify more than eight danger signs of pregnancy. Overall, 75% (150/200) of participants were well-prepared. On bivariate analysis, good preparedness have been found to be significantly associated (p-value <0.05) with age group, type of decision maker during pregnancy and presence of the husband accompanying their wives in any of the ANC visits.

Conclusion: Majority of the population were well-prepared, but awareness on danger signs was very low. Women empowerment in terms of behavior change communication at family, community and tertiary care level to be carried out through formal and informal approaches are the needs of the hour.

Keywords: Antenatal care, Danger signs, Janani suraksha yojana, Skilled birth attendant

INTRODUCTION

Pregnancy is an extraordinary period in the life of all mothers who dream of a safe antenatal period and a healthy baby. However, every pregnant woman carries the risk of sudden, unpredictable complications that could end in death or injury to her or to her newborn [1]. Globally, more than 40% of pregnant women experience acute obstetric problems [2]. In 2019, World Health Organisation (WHO) estimated that 94% of all maternal deaths occur in low and lower middle-income countries [3]. The target of achieving global Maternal Mortality Ratio (MMR) in The Sustainable Development Goals (SDG) is less than 70 per 1,00,000 live births by 2030 [4]. The National Health Policy (NHP), 2017 has set the target of achieving MMR to 100 per 1,00,000 live births by 2020 [5]. MMR dropped to 113 in 2016-18 from 130 in 2014-16 [6].

Therefore, we are on the verge of achieving the goal in 2020. Thaddeus and Maine have identified "three delays" in seeking, reaching and obtaining appropriate care as the pivotal factors behind maternal mortality [7]. The BPACR is the process of planning for normal birth and anticipating the actions needed in case of an emergency [1]. The BPACR is one of the most conceptually robust and logical approaches for addressing these delays [8].

In India, several initiatives including JSY have been undertaken under the National Health Mission (NHM) to ensure access to skilled care at birth and emergency obstetric care for complications [7]. It also includes financial benefits to avail ANC that includes free referral transport [9].

College of Medicine and Sagore Dutta Hospital (CMSDH) is a Government Medical College located at Kamarhati municipality in the district of North 24 Parganas in West Bengal adjacent to Kolkata and caters population mainly from Kamarhati and adjacent municipalities such as Khardah, Titagarh and Panihati. With this background, the present study was conducted with the objectives of assessing the knowledge and practice of BPACR among the mothers of the newborns delivered at the In Patient Department (IPD), Department of Gynaecology and Obstetrics, CMSDH using BPACR index and determining association, if any, between socio-demographic and other variables and BPACR status of the study population.

MATERIALS AND METHODS

The cross-sectional observational study was conducted at Inpatient Department (IPD), Department of Gynaecology and Obstetrics, CMSDH, Kolkata, India, from July 2017 to September 2017.

Inclusion and Exclusion criteria: Mothers who have delivered their baby within last seven days were considered as the study population. All eligible participants who provided written informed consent to participate were included in the study whereas mothers of severely ill newborns and mothers who themselves were severely ill were excluded from the study.

Sample size calculation: In a study conducted by Acharya AS et al., among antenatal women attending a Primary Health Centre (PHC) in Delhi, the prevalence of identification of a skilled attendant at birth for delivery was 81.1% [2]. Using the formula $4pq/l^2$ and relative precision 7%, the sample size became 190 (here, p=Proportion of study participants who identified a skilled birth attendant for delivery, q=Proportion of study participants who did not identify a skilled birth attendant for delivery, l=Relative precision). Assuming 5% non-response rate, the final sample size was 199. According to the records kept in the Department of Gynaecology and Obstetrics; on average, 90 deliveries are conducted every month.

All mothers who fulfilled the inclusion criteria and provided informed consent were interviewed. During the period of data collection for two months, a total of 200 mothers were interviewed and thus, the final study population became 200.

Baseline socio-demographic information about age, religion, place of residence, educational status, occupation, occupation of husband, educational status of husband, type of family, monthly family income, number of family members, Socio-economic Status according to Modified BG Prasad's Scale, August 2020 and information on type of the nearest available health facility, distance of health facility from house, parity, trimester of registration during pregnancy, number of antenatal visits, availing ANC in 1st trimester by skilled provider, accompanied by husband in any of the antenatal visits, types of health problems experienced during pregnancy, decision makers in the family during pregnancy, knowledge of danger signs during pregnancy, knowledge of financial assistance in JSY, knowledge about transportation provided by the government, identification of skilled birth attendant for delivery, arrangement for money and identification of mode of transport were collected by interviewing the mothers with the help of a predesigned, pretested, semi-structured schedule [1,2,7]. The schedule was pretested on ten postnatal mothers in the same ward who were not included among the study population and was modified accordingly. Overall internal reliability (Cronbach's alpha=0.82) of the questionnaire was high. The questionnaire was made in English. It was translated in Bengali and then retranslated in English by a language expert.

Medical records such as OPD tickets, reports of laboratory investigations and previous certificates of discharge from hospital were also reviewed, when available, for collection of missed information during the interview and for cross-checking of the responses provided by the participants.

Birth Preparedness and Complication Readiness Index (BPACR Index)

BPACR index was developed by Johns Hopkins Bloomberg School of Public Health and has been used in many studies conducted worldwide including India [2]. To assess BPACR status among recently delivered women, a set of following indicators has been identified in previous studies in India.

- Percentage of the women who knew about more than eight danger signs of pregnancy.
- Percentage of the women who knew about financial assistance provided by government in JSY.
- Percentage of the women who knew about transportation provided by government in JSY.
- Percentage of the women who availed ANC in 1st trimester by skilled provider.
- Percentage of the women who identified skilled birth attendant for delivery.

- Percentage of the women who identified mode of transportation.
- Percentage of the women who saved money to pay for expenses.

The mothers who fulfilled at least four BPACR practices were considered "well-prepared" and the rest of them were taken as "less prepared" [10].

STATISTICAL ANALYSIS

Statistical analyses were performed using Statistical Package for the Social Sciences (SPSS) Version 20.0 (SPSS, Chicago, Illinois, USA). Continuous data was presented in the form of mean±standard deviation and categorical data were presented in the form of frequency and percentages. Appropriate bivariate analyses were performed using Chi-square test to determine association between preparedness status of BPACR and socio-demographic and other variables. The p-value of less than 0.05 was taken as statistically significant.

RESULTS

Out of total 200 participants, about 69% belonged to age group of 20-29 years. Mean age of the respondents was 24.43 years (SD±4.57 years). All, except six, were homemakers. More than 85% of mothers belonged to joint families [Table/Fig-1]. Ninety-five percent of the study population resided in urban areas.

Majority of (56%) mothers were nulliparous and 8% had parity two or more than two. In the last pregnancy, 96.5% of them paid antenatal visits for ≥4 times. Swelling of hands and feet (43%) was the most common health problems experienced during pregnancy followed by severe vomiting (28.5%) [Table/Fig-2].

Variables	Number (N=200)	Percentage (%)
Age group (Years)		
≤19	30	15.0
20-24	76	38.0
25-29	62	31.0
30-34	24	12.0
35-39	8	4.0
Educational status		
Illiterate	4	2.0
Literate (Non-formal)	4	2.0
Primary	20	10.0
Middle	68	34.0
Secondary	46	23.0
Higher secondary	42	21.0
Graduate and above	16	8.0
Religion		
Hindu	124	62.0
Muslim	76	38.0
Occupation		
Homemaker	194	97.0
Unskilled labour	2	1.0
Service	2	1.0
Teacher	2	1.0
Educational status of the husband		
Illiterate	5	2.5
Literate (non-formal)	4	2.0
Primary	20	10.0
Middle	70	35.0
Secondary	47	23.5
Higher secondary	32	16.0
Graduate and above	22	11.0

Socio-economic status [Modified BG Prasad's Scale, August 2020]		
I (≥ 7715)	2	1.0
II (3858-7714)	18	9.0
III (2315-3857)	26	13.0
IV (1157-2314)	62	31.0
V (≤ 1156)	92	46.0
Type of Family		
Joint	173	86.5
Nuclear	27	13.5

[Table/Fig-1]: Socio-demographic profile of study population (N=200).

Variable	Number (N=200)	Percentage (%)
Parity		
0	112	56.0
1	72	36.0
2	14	7.0
>2	2	1.0
Number of antenatal visits		
<4	7	3.5
≥ 4	193	96.5
Type of health problems experienced during pregnancy*		
Severe vomiting	57	28.5
Swelling hands and feet	86	43.0
Severe pain abdomen	19	9.5
Headache	13	6.5
Semester of registration during pregnancy		
1 st	99	49.5
2 nd	80	40.0
3 rd	21	10.5

[Table/Fig-2]: Distribution of study population according to last antenatal history (N=200).

*Multiple responses

Nearly, 50% had rural hospital as their nearest available health facility followed by Medical Colleges (39%). About 2/3rd of couples were the decision makers during pregnancy. Husband and the Mother-in-Law were the sole decision makers in 10% of cases each. Three-fourth of the husbands of the study participants accompanied their spouses in at least one ANC visit [Table/Fig-3].

The final BPACR index was 61.07. For individual indicators among BPACR index, all participants identified Skilled Birth Attendant for delivery. Almost all of them were aware on financial assistance provided by government in the form of JSY. Among 200 mothers, little below 90% of them knew about transportation provided by government in JSY. ANC was conducted by skilled provider for 63.5% of mothers. About 38.5% of mothers identified mode of transportation and saved money to pay for expenses. No participant could identify more than eight danger signs of pregnancy [Table/Fig-4].

Seventy five percent (150/200) of participants fulfilled at least four BPACR practices and were well-prepared for BPACR. On bivariate analysis, birth preparedness was found to be significantly associated (p -value <0.05) with age group of 20-29 years, the decision maker during pregnancy and husband accompanying any of the ANC visits [Table/Fig-5].

DISCUSSION

BPACR is a key component of globally accepted safe motherhood programs which helps to provide professional delivery care in the intranatal period and to reduce delays in case of obstetric complications [11]. In the present study, final BPACR index was 61.07. In a study conducted by Acharya AS et al., among antenatal women attending a PHC in Delhi, BPACR index was very low (41%) [2]. Sharma N et al.,

Variable	Number (N=200)	Percentage (%)
Type of nearest available health facility		
Primary Health Centre	8	4.0
BPHC	4	2.0
Rural Hospital	94	47.0
Medical College	78	39.0
Others	16	8.0
Distance of nearest available health facility from home (km)		
<2	158	79.0
2-5	24	12.0
>5	18	9.0
Decision makers during pregnancy*		
Husband	20	10.0
Wife	12	6.0
Both	131	65.5
Mother-in-Law	20	10.0
Father-in-Law	1	0.5
Whole Family	12	6.0
Mother	4	2.0
Husbands accompanying any of the visits		
Yes	150	75.0
No	50	25.0

[Table/Fig-3]: Distribution of study population according to different variables associated with BPACR (N=200).

*Mutually exclusive

Indicators*	Number (N=200)	Percentage (%)
Women who knew more than eight Danger Signs of pregnancy	0	0.0
Women who knew about financial assistance provided by government in Janani Suraksha Yojna (JSY)	198	99.0
Women who knew about transportation provided by government in JSY	177	88.5
Women who availed ANC in 1 st trimester by skilled provider	127	63.5
Women who identified Skilled Birth Attendant (SBA) for delivery	200	100.0
Women who identified mode of transportation	77	38.5
Women who saved money to pay for expenses	76	38.0

[Table/Fig-4]: Distribution of study population according to seven indicators of BPACR status (N=200).

*Multiple responses

reported BPACR index as 66.9 out of 200 women in a rural block of Haryana [12], Deshmukh N et al., found BPACR index as 27.8% among 110 women in rural Chhattisgarh [13]. BPACR index was 46.2% as reported by Gupta S et al., in a study among 527 antenatal attendees at a PHC in Jhansi [14]. Study conducted by Mukhopadhyay DK et al., in a district of West Bengal shows only 26.1% of women being aware of the concept of birth preparedness [7]. BPACR preparedness was observed among 35.9% out of 371 antenatal mothers attending the district hospital in Tumkur, Karnataka as reported by Rajesh P et al., [10]. In a study conducted in Southern Ethiopia among 743 pregnant women by Hailu M et al., it was reported that only 20.5% were prepared for birth and its complications [15]. Such wide variations in BPACR status among different studies may be attributed to wide geographical and socio-cultural variations in study settings.

All women in the current study had identified a skilled birth attendant. Most of the other studies also found a high proportion of identification of skilled birth attendants. In Chhattisgarh study, about 73.7% of women identified a skilled birth attendant for delivery [13]. The Delhi study reported that about 81% had identified a skilled birth attendant [2]. In Jhansi study, most of the mothers (83%) identified skilled birth attendant at birth for delivery [14].

Name of variable	Well prepared		Less prepared		p-value	χ^2 (Chi-square)
	Number	Percentage (%)	Number	Percentage (%)		
Age group (Years)*						
≤19 (n ₁ =30)	19	63.3	11	36.7	0.029921	7.0184, D.F=2
20-29 (n ₂ =138)	111	80.4	27	19.6		
≥30 (n ₃ =32)	20	62.5	12	37.5		
Educational status						
Below Secondary (n ₁ =96)	67	69.8	29	30.2	0.102196	2.6709, D.F=1
Secondary & above (n ₂ =104)	83	79.8	21	20.2		
Educational status of husband						
Below Secondary (n ₁ =99)	69	69.7	30	30.3	0.086395	2.9403, D.F=1
Secondary & above (n ₂ =101)	81	80.2	20	19.8		
Religion						
Hindu (n ₁ =124)	92	74.2	32	25.8	0.736545	0.1132, D.F=1
Muslim (n ₂ =76)	58	76.3	18	23.7		
Socio economic status [Modified BG Prasad's Scale, August 2020]						
I (≥7715) (n ₁ =2)	2	100.0	0	0.0	0.174421	1.8445, D.F=1
II (3858-7714) (n ₂ =18)	11	61.1	7	38.9		
III (2315-3857) (n ₂ =26)	25	96.2	1	3.8		
IV (1157-2314) (n ₂ =62)	47	75.8	15	24.2		
V (≤1156) (n ₂ =92)	65	70.7	27	29.3		
Number of ANC visits						
<4 (n ₁ =7)	6	85.7	1	14.3	0.505143	0.4441, D.F=1
≥4 (n ₂ =193)	144	74.6	49	25.4		
Parity						
0 (n ₁ =112)	89	79.5	23	20.5	0.20286	3.1905, D.F=2
1 (n ₂ =72)	51	70.8	21	29.2		
≥2 (n ₃ =16)	10	62.5	6	37.5		
Type of nearest available health facility						
Primary Health Centre (n ₁ =8)	6	75.0	2	25.0	0.875004	0.2671, D.F=2
BPHC (n ₂ =4)	4	100.0	0	0.0		
Rural hospital (n ₃ =94)	68	72.3	26	27.7		
Medical college (n ₄ =78)	60	76.9	18	23.1		
Others (n ₁ =16)	12	75.0	4	25.0		
Distance of nearest health facility from home (km)						
<2 (n ₁ =158)	114	72.2	44	27.8	0.071207	3.255, D.F=1
2-5 (n ₂ =24)	22	91.7	2	8.3		
>5 (n ₃ =18)	14	77.8	4	22.2		
Decision-maker during pregnancy*						
Both (n ₁ =131)	119	90.8	12	9.2	0.00001	50.8095, D.F=1
Others (n ₂ =69)	31	45.0	38	55		
Husbands accompanying any of the visits*						
Yes (n ₁ =150)	124	82.7	26	17.3	0.000014	18.8089, D.F=1
No (n ₂ =50)	26	52.0	24	48.0		

[Table/Fig-5]: Socio-demographic and pregnancy related correlates of BPACR.

*Statistically significant difference (p-value<0.05); DF: Degrees of Freedom

However, in an earlier study conducted in Indore, Agrawal S et al. found that skilled attendance was very low during deliveries (7.4%) and 77.3% of deliveries were assisted by traditional birth attendants [16]. In a Southern Ethiopian study, only 20.5% of antenatal mothers identified a skilled provider and 8% identified health facility for delivery and to deal with obstetric emergencies [15]. Nevertheless, in another study conducted in Northern Ethiopia among 534 women Hiluf M and Fantahum M, found that 81% of women had identified a skilled provider for birth [17]. Differences in social, economic and

cultural situations even within the same country are probable factors behind such wide differences.

Poor knowledge among mothers about danger signs of pregnancy has always been considered a vital issue. In the present study, no woman knew more than eight danger signs of pregnancy. Delhi study reported that overall awareness of danger signs of pregnancy was very low (27.8%) [2]. West Bengal study revealed that only 20.6% of women were aware of at least one key danger sign of pregnancy [7]. Chhattisgarh's study revealed that 74.5% women were unaware of

danger or warning signs in antenatal period, 89.1% were unaware of the intranatal complications and 97.3% women had no idea about puerperal complications [13].

Delhi and Karnataka study have also reported low level of knowledge [2,10]. It was similar to a multicentric study conducted in Nigeria, where it was reported that 71% of participants possessed high level of awareness though they had poor knowledge of specific danger signs during intranatal and postpartum period [18].

Preparedness for transportation and saving of money for delivery purposes are also two vital issues that can change the outcome of delivery. In the present study, 38.5% of mothers identified mode of transportation.

In the Northern Ethiopian study, preparedness for transportation was found to be very low (7.7%) [17]. In Chhattisgarh study, only 10% of women saved money for delivery [13] in comparison to the present study where 38% of women saved money to pay for expenses. According to Delhi study, about 49% of women had saved money for delivery and about 44% of the participants had identified a mode of transportation for the delivery [2]. Differences in socio-economic situations may be responsible for such variations. About 49.5% of women in the present study registered themselves in 1st trimester whereas in Delhi study, only 43% of women were aware about early registration of pregnancy [2]. Awareness about early registration was also low (47%) in Jhansi study [14].

In the present study, 75% of postnatal women were well-prepared. About 58.5% of women were well-prepared for BPACR in Haryana study [12]. In Indore study, 48% of mothers were reported well-prepared [16]. In Southern Ethiopian study, it was reported that only 17% of pregnant women were well-prepared overall [15]. The present study was conducted in a hospital setting where usually more well-prepared mothers are admitted. This factor might attribute to the higher level of BPACR in the present study in comparison to other community based studies.

In the present study, well preparedness have been found to be significantly associated ($p < 0.05$) with 20-29 year age group, decision maker during pregnancy and whether husband accompanied any of the ANC visits. In Indore study, following factors were associated with well preparedness: maternal literacy {odds ratio (OR)=1.9, 95% Confidence Interval (CI): 1.1-3.4} and availing of antenatal services (OR=1.7, CI: 1.05-2.8). Presence of skilled birth attendant during delivery was three times higher in well-prepared mothers than in less-prepared mothers (OR: 3.0, CI: 1.6-5.4) [16]. In Haryana study, BPACR was found to be significantly associated with education of participants, occupation of study subjects, participant's husband's education, participant's socioeconomic status, and caste [12]. Karnataka's study found significant association with parity, education status of mother and childbirth within two years and well preparedness status of BPACR [10]. In multivariate analysis, the North Ethiopian study found that birth preparation and its complications were more among literate mothers and those with parity 2-4. It was also found higher among those having history of still birth and among those who were advised about birth preparedness during their antenatal visits [17]. Although educational status of the mother was a significant factor associated with birth preparedness reported in a number of previous studies, such association could not be established in the present study.

As future recommendations, at the tertiary care hospitals, a separate session for antenatal mothers and their husbands and other family members should be commenced to impart education on pregnancy and BPACR by trained counsellors and physicians. At the national level, Reproductive, Maternal, New born, Child and Adolescent Health (RMNCH+A) programme should be strongly implemented with better coverage and robust quality of care. At the community level, both formal and informal leaders including local political representatives should be made aware of the study result. Urban PHCs of local municipalities should organise camps, Focus Group Discussions (FGDs) and meeting among community members especially among women

home-makers to discuss pregnancy, warning signs and necessity of BPACR. The importance of having knowledge about danger signs in pregnancy should be emphasised during discussion. Every effort should be made to involve mothers-in-law and other elderly persons in the family in these formal and informal group activities.

Limitation(s)

First, it was not a community-based population study. Nevertheless, most of the study population belonged to Kamarhati and the adjacent municipalities such as Khardah, Titagarh and Panihati. Therefore, most of the study population represented a community belonging to a definite geographic area around CMSDH. Secondly, cross-sectional design was one of the limitations of the present study and therefore, more studies of longitudinal design are required to establish associations with possible factors and to have a more comprehensive understanding of the whole issue. Third, to collect information on few variables, such as per capita monthly income, researchers had to depend upon the respondents and therefore, the possibility of recall bias and conscious falsification could not be completely ruled out. Lastly, despite the best efforts from researchers, collecting full obstetric history of participants by interview and by cross-checking the medical records was not always possible mostly due to unavailability of such records.

CONCLUSION(S)

Despite the facts that three-fourth of the participants were well-prepared, three-fourths of their husbands accompanied them during antenatal visits, nearly half of them registered during 1st trimester of pregnancy, nine out of ten had antenatal visits for four times or more and all of them identified skilled birth attendant for delivery; no participant could identify more than eight danger signs of pregnancy. Most of them did not identify the mode of transport during delivery and saved money for delivery expenses. Again, more than three-fifth of mothers did not avail ANC by skilled provider when mother-in-law or the whole family was the sole decision maker. Well preparedness was found to be significantly associated with age group, decision maker during pregnancy and husband accompanying in any of the ANC visits. Women empowerment should be the key to improve access to BPACR.

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REFERENCES

- [1] Rakesh J, Johnson AR, Angeline, Sourmya, Agrawal T. Birth preparedness and complication readiness among women availing obstetric services at a rural maternity hospital in south Karnataka, India. *Int J Curr Res Aca Rev.* 2017;5(5):24-30.
- [2] Acharya AS, Kaur R, Prasuna JG, Rasheed N. Making pregnancy safer-birth preparedness and complication readiness study among antenatal women attendees of a primary health center, Delhi. *Indian J Community Med.* 2015;40(2):127-34.
- [3] World Health Organisation. 19 Sep 2019. <https://www.who.int/news-room/factsheets/detail/maternal-mortality>. Accessed 25 January 2021.
- [4] UN. Transforming Our World: The 2030 Agenda for Sustainable Development. Available from <https://www.Sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>. Accessed 24 June 2018.
- [5] National Health Policy 2017. Ministry of Health & Family Welfare. Available from <https://mohfw.gov.in/sites/default/files/9147562941489753121.pdf>. Accessed 16 January 2020.
- [6] Sample Registration System. Office of the Registrar General, India, Ministry of Home Affairs, Govt. of India. Special Bulletin on Maternal Mortality in India 2016-18. New Delhi. https://censusindia.gov.in/2011-common/Sample_Registration_System.html. July 2020.pdf. Accessed 25 January 2020.
- [7] Mukhopadhyay DK, Mukhopadhyay S, Bhattacharjee S, Biswas AK, Biswas AB. Status of birth preparedness and complication readiness in Uttar Dinajpur District, West Bengal. *Indian J Public Health.* 2013;57(3):147-54.
- [8] Stanton CK. Methodological issues in the measurement of birth preparedness in support of safe motherhood. *Eval Rev.* 2004 28(3):179-200.
- [9] Govt. of India. Planning Commission. Eleventh Five Year Plan 2007-12. New Delhi. Vol.2, Chapter 3. Social Sector: Health and Family Welfare and AYUSH; 2008. pp: 57-127.

- [10] Rajesh P, Swetha R, Rajanna MS, Iyengar K, Mahesh SH, Gowda C. A study to assess the birth preparedness and complication readiness among antenatal women attending district hospital in Tumkur, Karnataka, India. *Int J Community Med Public Health*. 2016;3(4):919-24.
- [11] Hailemariam A, Nahusenay H, G/Hana E, Abebe A, Getaneh B. Assessment of magnitude and factors associated with birth preparedness and complication readiness among pregnant women attending ANC Services at public health facilities in Debrebirhan Town, Amhara, Ethiopia 2015. *Global Journal of Medical Research*. 2019;16 (2):39-44.
- [12] Sharma N, Kumar N, Singh S, Malik JS, Jangra A. Status and determinants of birth preparedness and complication readiness in a rural block of Haryana. *J Family Med Prim Care*. 2019;8 (2):482-86.
- [13] 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.
- [14] Gupta S, Yadav R, Malhotra AK. Birth preparedness and complication readiness plans among antenatal attendees at primary health centre of district Jhansi, UP, India. *Int J Intg Med Sci*. 2016;3(4):258-64.
- [15] Hailu M, Gebermarian A, Alemseged F, Deribe K. Birth preparedness and complication readiness among pregnant women in southern Ethiopia. *PLoS ONE*. 2011;6(6):e21432.
- [16] Agarwal S, Sethi V, Srivastava K, Jha PK, Baqui AH. Birth Preparedness and Complication Readiness among Slum Women in Indore City. India. *J Health Popul Nutr* 2010 Aug; 28 (4):383-91.
- [17] Hiluf M, Fantahum M. Birth preparedness and complication readiness among women in Adigrat town, North Ethiopia. *Ethiop J Health Dev*. 2007;22(1):14-20.
- [18] Ekabua JE, Ekabua KJ, Odusolu P, Agan TU, Ikhlaiqi CU, Etoki Dam AJ. Awareness of birth preparedness and complication readiness in south eastern Nigeria. *ISRN Obstetrics and Gynecology*. 2011;2011(1):560641.

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