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## **Full Length Research Article**

### **BIRTH PREPAREDNESS AND OBSTETRIC HEALTH COMPLICATIONS: A STUDY BASED ON A TERTIARY HOSPITAL OF MUMBAI**

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#### **ABSTRACT**

A quantitative study was carried out in a tertiary-care hospital to examine the level of birth-preparedness and experience of obstetric health complications among women those were from lower socio-economic strata of Mumbai. Asemi-structured questionnaire was developed and open-ended questions were included to interview 300 women who delivered during January-May 2013 in the selected hospital. Total eight components of birth-preparedness was considered in the study and a woman that satisfied at least three of the components was considered as 'well-prepared'. About 67% of the women satisfied any one component of birth-preparedness, while proportion was low for well-prepared (23.7%). A statistically significant positive correlation was found between birth-preparedness and any complication during pregnancy. Women with health complications were more likely to be well-prepared for the birth compared to their counterpart because they needed more care for safe delivery. However preparedness for birth was decreases with increasing in parity. Similarly well-prepared women had a lesser probability of developing any delivery complications. In this study ethnicity and education was found as strong predictors of birth-preparedness. Although a large proportion reported of less-preparedness, so it is very much important to make women aware of the importance of birth-preparedness for better health outcome.

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#### **INTRODUCTION**

Maternal mortality is considered to be the most significant outcome of poor maternal health. Many women in developing countries experience life-threatening, and other serious health issues related to pregnancy and childbirth. Complications during pregnancy and childbirth cause more deaths and disabilities among women than any other reproductive health complications and are the leading cause of disability and death among women in the age groups of 15-49 years (EC/UNFPA, 2000). Under the National Health Mission several interventions were undertaken to enable women to access skilled care at birth, emergency obstetric care for complications, financial assistance for availing antenatal and intra-natal care including referral transport to meet the target of Millennium Development Goal-5 in India (Planning Commission, 2008). Still there is a shortfall in access to health care facilities by the poorer section of the society.

This remain a key challenge to achieve the goals related to maternal and child health as placed out in MDGs 4 and 5 (Kochukuttan *et al.*, 2013). It is very difficult to predict life-threatening obstetric complications during pregnancy. Therefore, receiving proper care from a skilled health professional or health providers during childbirth has been identified as the most important intervention for safe motherhood. However, the use of health care and visits by skilled providers remain low in developing countries remain (Yuster, 1995).

Earlier studies showed that a skilled provider assisted only half of the women during childbirth. To tackle this problem, the Maternal and Neonatal Health (MNH) Program in developing countries introduced the concept of Birth-Preparedness of antenatal mothers (Stanton, 2004; Ronsmans *et al.*, 2006). Birth-preparedness (including being prepared for possible complications) is a comprehensive strategy to plan and prepare for delivery and improve its outcomes (Moran *et al.*, 2006).

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It include several components like preparing for a normal delivery, readiness to deal with complications, knowledge of the warning (or danger) signs of complications, planning for place of delivery and plans for a birth attendant as well; transportation to health-care facility, saving money, post-natal and newborn care, etc. Meanwhile, birth-preparedness also helps the mother to know about her health and care for her new-born (Kaur *et al.*, 2009). Birth-preparedness helps to ensure that women can reach a professional delivery care facility with the onset of labour. Birth-preparedness also helps to reduce avoidable delays in recognizing complications, and in seeking skilled care from qualified providers (Kaur *et al.*, 2009). Studies show that these delays often result in preventable maternal deaths (Safe Motherhood Program, 2002; Ross, 1998; Jahn *et al.*, 2001; JHPIEGO, 2004).

A strategy to eliminate or at least minimize the delays should begin at the community level and be linked to improved access to basic and comprehensive essential obstetric care (BEOC/CEOC) (Safe Motherhood Program, 2002; Ross, 1998; WHO, 2004; Mother Care Matters, 2000). Birth-preparedness also provides information regarding appropriate sources of emergency obstetric care. It also gives educates households on the necessity to set aside money for an emergency so as to avoid delay in transportation and access to care for want of funds (John *et al.*, 2011).

A study, which was carried out in a slum setting in Indore (Agarwal *et al.*, 2010) revealed that less than half the women were well-prepared for delivery and obstetric emergency in terms of maternal literacy and availing antenatal check-ups being important predictors for birth preparedness. In this context, the main objective of the study is to find the association between birth preparedness and obstetric health complications among women from the lower socio-economic strata in Mumbai.

## STUDY AREA

Although there has been increasing concern over the general health and morbidity status of women in India but still, more attention has required to the reproductive morbidity among women. The population of Mumbai has gone up considerably and worrying fact is that the number of people staying in slums has also increased by an alarming way. According to the 2011 census, the population of Mumbai is 1.24 crore which was 1.19 crore in 2001. Being a metropolitan city, the situation in Mumbai is very different from other cities as a large percentage of the population lives in the slum areas. Hence, our study tries to bring out the utilization of health care facility and obstetric health complications among women that belong to the low-income household, living in slum areas, poor and not afford the health facilities that provided by the private health sector. Hence, this study tries to bring out the utilization of health care facilities as well as birth preparedness among women that belongs to low-income household, living in slum areas, poor and not afford the health facilities that provided by the private health sector. In this context, a tertiary hospital has selected which is situated nearby the slum areas of Mumbai. The interview has done on women (inpatients) who come for delivery at the selected tertiary hospital and are from the lower socio-economic strata of the population.

## MATERIALS AND METHODS

The present study endeavoured to collect self-reported obstetric health complications (during pregnancy and delivery) through a primary survey from inpatient interviews in a tertiary-care hospital of Mumbai. The case sheets of the patients were cross-checked to verify the self-reported health status. Quantitative data was collected from a total of 300 inpatients, who were selected based on their consent for participating in the interview. The study was conducted during the period January to May 2013, and included respondents who came to the hospital to deliver their babies during the survey period.

The focus for the study was women belonging to the lower socio-economic strata. Most of the respondents lived in the slum areas near the hospital. Their reasons for coming to this hospital included easy accessibility and low cost of treatment. The data was collected from the women (inpatients) using semi-structured schedule with open-ended questions. The questionnaire included questions regarding obstetric health complications during pregnancy, delivery and just after delivery. Questions were asked about the birth preparedness practices followed for the most recent birth. This study also considered socio-demographic predictors of background characteristics of the women. Socio-demographic characteristics included current age, age at marriage, educational attainment, working status, religion, parity, type of delivery, number of antenatal care visits (ANC), complications during pregnancy and delivery, etc. The study include various components of birth preparedness such as receiving ANC, the place where to receive ANC, decision to go for institutional delivery, selection of hospital for delivery, person present during delivery, transportation, whether the woman's family had saved money for an emergency, naming ceremony, etc.

For the purpose of analysis, birth-preparedness is coded as 1 for 'any preparedness' and 0 for 'no preparedness.' In methodology, the standard descriptive analysis was carried out. To measure the level of birth preparedness, the study included those women who confirmed having practised at least three components were considered as 'well-prepared'. Those who did not were considered as 'less-prepared'. This categorization has been used in previous studies of birth-preparedness (Kumar *et al.*, 2008). Finally, being well-prepared or less-prepared for birth and association with other socio-demographic characteristics and an obstetric health complication was evaluated using the chi-square test and multivariate analysis using binary logistic regression. All the analysis was done with SPSS 20.

The International Institute for Population Sciences Students Research Ethics Committee (IIPS-SREC) has approved for the study, and the participants had given their verbal informed consent to participate in the interview. The written consent has not been obtained from the participants because the participants were the inpatients and those had delivered baby just two or three days back from the date of interview. The patients were not in a good health condition to write down the consent form and keeping this in mind the verbal consent has taken.

The participant's verbal consent were written and recorded in a paper and assure them to keep it fully confidential. The IIPS-SREC Committee has approved the procedure for taking participant's consent for the study.

## RESULTS

Table 1 represents the socio-economic and demographic profile of the studied women. The mean age of the respondent is 25 years with a standard deviation of  $\pm 4.06$  years. The highest numbers of respondent were in the age group of 20-24 years (45.7%) whereas only 3 percent of respondent belongs to less than 20 years of age. The mean age of the respondents at marriage was 19 years ( $SD \pm 2.71$ ). For the women interviewed, about 32% of the births were of the first parity, 49% second, 19% of the third or higher parity. Three-fourth of the women had attained some level of education. 61% had completed five to ten years of education and about 10% had more than 10 years of education. Very few women reported being employed ( $N=10$ ) in occupations such as tailoring (0.3%), offices (1%), small scale jobs (1.3%) or as housemaids (1.3%).

**Table 1. Demographic characteristics of the surveyed inpatients in the studied hospital of Mumbai**

Background Characteristics	%	N
Age of Women (mean 25.25 $\pm$ 4.06)		
Less than 20 years	3.3	10
20-24 years	45.7	137
25-29 years	33.3	100
More than 30 years	17.7	53
Age at marriage (mean 19.50 $\pm$ 2.71)		
Less than 20 years	56.6	170
20-25 years	39.7	119
More than 25 years	3.7	11
Marriage Duration (Mean 5.73 $\pm$ 4.03)		
Less than 5 years	44.0	132
5-10 years	45.0	135
More than 10 years	11.0	33
Birth order		
One	32.0	96
Two	48.7	146
Three and more	19.3	58
Education of Women		
No education	24.7	74
Less than 5 years	4.7	14
5-10 years	61.0	183
More than 10 years	9.6	29
Employment status		
Not-employed	96.7	290
Employed	3.3	10
Birth preparedness		
Yes	67.0	201
No	33.0	99
N	100.0	300

Figure 1 shows the percentage distribution of women in the categories of birth preparedness for each type of birth preparation. In this study we considered eight different components of birth preparedness like whether respondent prepared for ANC or not, decided place for ANC, were to go for delivery (institutional delivery), selection of hospital (private/public), arranged for transportation, saved money and planned for naming ceremony for the child etc. The result reveals that women who said to have any birth preparedness; majority of them had prepared for receiving ANC during

pregnancy (66.7%), place for ANC (66.3%) and institutional delivery (63.7%). Among the interviewed women who had birth preparedness, 46 percent of them had chosen a hospital for delivery. However, only about 2 percent pregnant women could arrange transportation for the emergency care and only 1 percent of women saved money for delivery care and related emergency. Similarly, 24 percent of women prepared who would be present with her at delivery time, and 30 percent prepared for a naming ceremony for the newborn. By using eight different components of the birth preparedness has described in Figure 4.1, a birth preparedness index has been constructed to assess the level of birth preparedness with different levels such as no preparation at all, well prepared and less prepared in the study.

Table 2 shows the birth preparedness of the women by their socio-demographic characteristics. 67% of the total women had reported birth preparedness of some kind for the most recent birth. Considering the age factor, it was seen that the proportion of preparedness (of any kind) is high among women in the age group of below 20 and above 30 years. (Below the age of 20 and above 35 years are considered to be high risk for reproduction). However, women belonging to the older age group showed poor levels of birth preparedness ( $\chi^2=3.13$ ,  $p < 0.01$ ).

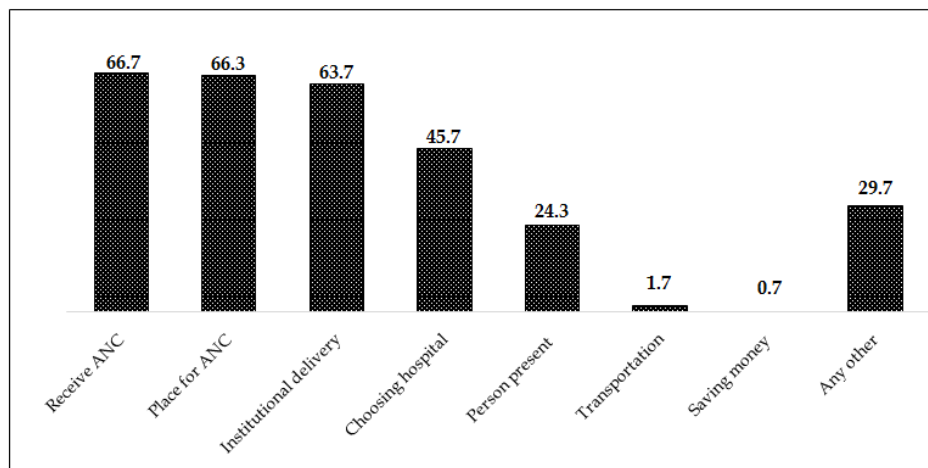
It was also found that women were more prepared for their first birth (90.6%) whereas birth-preparedness declined with increase in parity ( $\chi^2=5.23$ ,  $p < 0.01$ ). By educational level, it was seen that birth-preparedness was high among women with secondary education or above as compared to women who were educated to only primary level ( $\chi^2=1.19$ ,  $p < 0.05$ ). Regression analysis also confirmed that women with secondary education were more likely to prepare for the birth ( $OR=2.38$ ;  $p < 0.10$ ). Similarly, it was seen that women with any birth-preparedness reported less complications during pregnancy ( $\chi^2=0.01$ ,  $p < 0.10$ ). Results of regression analysis also showed that women who were prepared were less likely to develop a complication during pregnancy ( $OR=1.20$ ,  $p < 0.05$ ). Similarly, women with birth-preparedness reported less delivery complications to a statistically significant ( $OR=2.19$ ,  $p < 0.05$ ) level.

Considering the levels of birth preparedness, it was found that 24% women were well-prepared while 43 percent were less prepared for the most recent birth. The results also showed that about 60% of the women aged 30 years, and above were not at all prepared for childbirth ( $\chi^2=4.03$ ,  $p < 0.01$ ). The level of birth preparedness (well-prepared) decreased with increasing age at marriage. 27% of the women who were well-prepared for child birth were married when they were less than 20 years. It was found that most of the deliveries by caesarean section were reported by women who were less-prepared (53.8%). More women with secondary education reported being well-preparedness (23.5%) than women with primary education (14.3%). However, unemployed women had better levels of birth preparedness than their employed counterparts.

**Table 2. Percentage of women reporting of type of birth-preparedness and odd ratios by background characteristics in Mumbai**

Characteristics	Birth Preparedness <sup>#</sup>	$\chi^2$	OR (95% CI)	Less prepared	Well prepared
Age of women					
Less than 20 years	70.0	3.13***	1.00	50.0	20.0
20-24 years	81.0		0.10 (0.01-0.79)	55.5	25.5
25-29 years	62.0		0.13 (0.01-1.15)*	35.0	27.0
More than 30 years	39.6		0.16 (0.01-1.80)	26.4	13.2
Age at marriage					
Less than 20 years	68.2	0.65	1.00	41.2	27.1
20-25 years	66.4		2.92 (1.26-6.78)	45.1	21.3
More than 25 years	58.8		0.12 (0.73-4.16)*	52.9	5.9
Parity of women					
One	90.6	5.23***	1.00	65.6	25.0
Two	65.1		0.66 (0.19-4.86)**	39.0	26.1
Three and more	32.8		0.62 (0.85-5.40)***	17.2	15.6
Type of delivery					
Normal	66.6	6.06	1.00	42.9	23.7
C-section	76.9		2.15 (0.24-3.44)	53.8	23.1
Forceps	64.3		1.24 (0.37-4.10)	35.7	28.6
Women's education					
Primary	73.6	1.19**	1.00	64.3	14.3
Secondary	78.8		2.38 (0.51-10.91)*	50.3	23.5
Higher	75.9		2.09 (0.34-8.41)	62.1	13.8
Working status					
Working	80.0	0.79	1.00	60.0	20.0
Not working	66.6		2.69 (0.26-2.72)	42.8	23.8
Religion					
Hindu	73.1	5.81	1.00	49.4	23.8
Muslim	60.0		1.23 (0.61-2.49)	36.4	23.6
Any pregnancy complication					
Yes	66.8	1.01*	1.00	23.3	43.5
No	75.0		1.20 (0.75-2.44)*	37.5	37.5
Any delivery complication					
Yes	47.8	1.03*	1.00	30.4	17.4
No	70.5		2.19 (0.35-3.32)*	45.7	24.8
Total	67.0 (201)			43.3 (130)	23.7 (71)

Note: # Women who had at least some preparation; p values \*\*\*<0.01, \*\*<0.05, \*<0.10



**Fig. 1. Percentage distribution of women by arrangement of different components of birth preparedness in Mumbai**

By religion, Hindu women were more prepared than Muslim women, whereas there is a negligible difference in the category of well-prepared ( $\chi^2=6.78, p<0.05$ ).

Fig 2 shows the different levels of birth preparedness and its association with a pregnancy complication in the sample population.

It was found that a large proportion of women are in the category of 'less-prepared' and reported complications during pregnancy, which was more than what was found among the 'well-prepared'. This shows a higher probability of developing a health complication during pregnancy in women that were less-prepared for childbirth compared to women those were well-prepared. Analysis was also carried out to see the association between birth preparedness and complications at delivery (Fig 3).

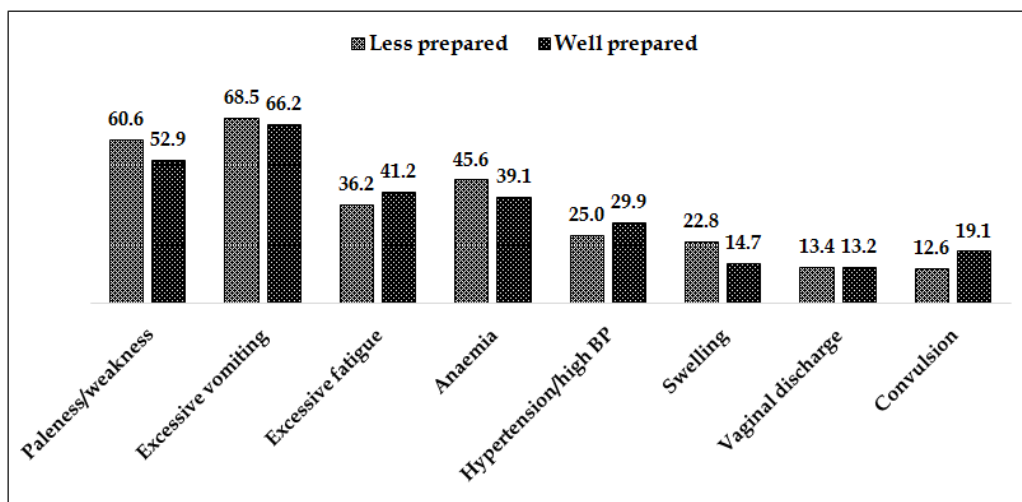


Fig. 2. Percentage of women reporting of type of birth-preparedness and pregnancy complications in Mumbai

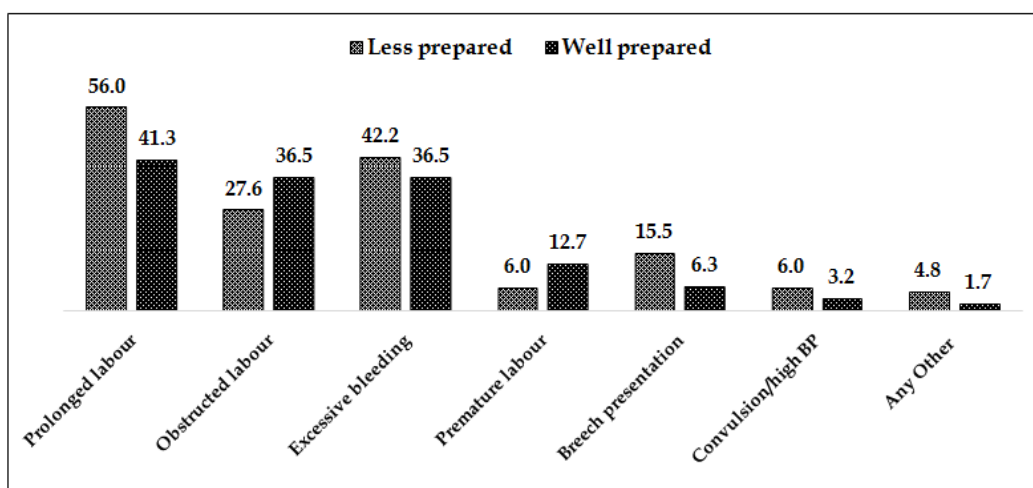


Fig. 3. Percentage of women reporting of type of birth-preparedness and delivery complications in Mumbai

The result revealed that women who experienced specific complications like prolonged labour (56.0%), excessive bleeding (42.2%), breech presentation (15.5%) and convulsion/ high-blood pressure (6.0%) during delivery were found to belong to the category of less-prepared

## DISCUSSION

This study assessed the birth preparedness among women and its association with health complications during pregnancy and delivery. Of the different components of birthpreparednessit was found that women were preparedwith receiving ANC at a fixed place, choosing to deliver at a hospital and choice of hospital. However, only a small proportion of women had set aside money for transportation and emergency care. Arranging for transportation is not difficult in Mumbai, but saving money for an emergency is important, especially for women from lower socio-economic groups (Pradhan, *et al.* 2009). A study by Moran *et al.* found that planning to save money for childbirth was also associated with services of a skilled provider at delivery.

A study carried out in Madhya Pradesh revealed a similar situation: a very small percentage of women save money for emergency purposes, but arranged for transportation (Kushawa *et al.*, 2009). The educational level of women has a positive impact on the birth preparedness of women in the lower socio-economic strata. This is because an educated woman can take decisions that concern her health, unlike her less educated counterpart (Mpembeni *et al.*, 2007). A study by Nawal and Goli (2013) showedthat birth- preparedness helps reduce the delays in accessing care when women experience obstetric complications (identifying the complication,deciding to seek care, reaching the appropriate care facility, etc.). The results of the study showed that women who were prepared suffered fewer complications and had safe deliveries than the women who were not. The findings of this study reveal a pattern of birthpreparedness among women in Mumbai from the lower socio-economic groups. More than three-fifths of the women had some degree of birthpreparedness, were not well-prepared. The level of birthpreparedness has varied with women's socio-demographic and economic factors. It was found that the level of birthpreparednesswas high among women in the younger and middle-age groups, with first and second parity, and among employed women.

Birth-preparedness of any kind was found to be higher among women who did not have any pregnancy complication. It may be concluded that women, who prepare for the birth of their children have lesser chances of developing obstetric complications during and after pregnancy. The study, which was carried out on women who delivered their children at the hospital, found one-third of the interviewed women were not birth-prepared except opting for institutional delivery. Studies carried out in slums in India (Agarwal *et al.*, 2007; Pandey *et al.*, 2007) show a trend of home deliveries among women who were not birth-prepared. Safe motherhood programmes are scaling up birth-preparedness and complication-readiness interventions to address the first two of the three delays of birth-preparedness, although there are studies that looked at the impact of birth-preparedness and complication-readiness on the use of skilled providers at delivery (Moran *et al.*, 2006).

Transportation in an emergency was not found to be an important issue. However, this largely depends on the local situation, and there could be occasions when transportation can become a critically important. Hence, programmes need to tailor their birth-preparedness messages for the context they are operating (Agarwal *et al.*, 2010). The study findings clearly show that a large proportion of women has birth-preparedness, but very few of them were well-prepared. There is evidence from earlier research that pregnant women receiving their first check-up in the first trimester followed by four or more antenatal checks were more likely to have a favourable outcome (Villar *et al.*, 2001; GOI, 2010).

## Conclusion

The present study highlights the need to encourage women, mainly from the lower socio-economic strata, to benefit from the facilities provided by the government and receive the necessary care during prenatal and post-natal period. There is also a need to empower women and their families to take their decision in the planning and implementation of birth-preparedness practices for better health outcomes.

## Competing interest

The authors have no competing interest.

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