Status and determinants of birth preparedness and complication readiness in a rural block of Haryana

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Abstract

Introduction: Pregnancy and motherhood is a physiological phenomenon. However, approximately 830 women die from preventable causes related to pregnancy and childbirth every day. Birth preparedness and complication readiness (BPACR) improves preventive behavior and improves knowledge of mothers about danger signs. Objective: The objective of the study is to assess the status and sociodemographic determinants of BPACR among the women who have experienced motherhood recently. Materials and Methods: The study was carried out among 200 women in a rural block of Haryana over a period of 6 months. The tool used to collect data was adapted from survey tools of Johns Hopkins Program for International Education in Gynaecology and Obstetrics/Maternal and Neonatal Health Program. Results: BPACR index came out to be 66.93 and 58.5% women were well prepared for BPACR. Education and occupation of participants, education of participant’s husband, socioeconomic status, and caste were found to be significantly associated with BPACR. Conclusion: BPACR is a comprehensive strategy to ensure safer pregnancy and motherhood. Providing educational and skill acquisition opportunities for rural women for their empowerment and increasing their role in decision-making are imperative in order to improve BPACR and promote utilization of skilled attendants at every delivery.

Keywords: Education, empowerment, pregnancy, well prepared

Introduction

Pregnancy and motherhood is a physiological phenomenon and a positive experience. However, many women suffer morbidities and mortality during these phases. According to WHO, approximately 830 women die from preventable causes related to pregnancy and childbirth every day and 300 million women in the developing world suffer from short-term or long-term morbidities due to pregnancy and childbirth.¹,² About 99% of all maternal deaths occur in the developing countries.³ India makes one-fifth contribution to the total maternal deaths annually. India’s maternal mortality rate reduced from 212 deaths per 100,000 live births in 2007 to 178 deaths in 2012 and 167 in 2013.³,⁴ The advance is largely due to key government interventions such as the Janani Shishu Suraksha Karyakram (JSSK).⁵

Majority of maternal deaths occur during labor, delivery, and within 24 h post-partum. Apart from medical causes, there are numerous interrelated sociocultural factors which delay care-seeking and contribute to these deaths.⁶ Provision of a skilled care provider during pregnancy and childbirth has been identified as the single most intervention to lower down complications and mortality.⁷ Despite 85% deliveries in Haryana being attended by skilled personnel,⁸ the maternal mortality ratio stands at 127 per 100,000 live births.⁹

Thaddeus and Maine documented three delays, namely, (a) delay in deciding to seek care if complication occurs; (b) delay in reaching care; and (c) delay in receiving care that contribute to maternal mortality.¹⁰

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The Maternal and Neonatal Health (MNH) Program of Johns Hopkins Program for International Education in Gynaecology and Obstetrics (JHPIEGO) developed the birth preparedness and complication readiness (BPACR) matrix to address these three delays at the level of the pregnant woman, her family, her community, health providers, health facilities, and policy makers during pregnancy, childbirth, and the postpartum period.\textsuperscript{[10]}

BPACR entails identifying a skilled provider and a birth location, recognition of danger signs that may indicate life-threatening complications for the mother and baby, saving money and arranging for transportation, identifying a blood donor, identifying the nearest emergency obstetric services should pregnant women, their families and communities need to seek assistance in case of emergencies. In addition, BPACR requires health providers and facilities to be prepared to attend births and treat complications.\textsuperscript{[11]} BPACR improves preventive behaviors, improves knowledge of mothers about danger signs, and leads to improvement in care-seeking during obstetric emergency. Hence, this study was done with the objective to assess the status and various sociodemographic determinants of BPACR among the women who have experienced motherhood recently.

**Materials and Methods**

*Study area:* The study was carried out in a rural block of district Rohtak, Haryana. The blocks cater to more than a lakh population and have 20 subcenters.

*Study duration:* The study was carried out for a period of 6 months from January 2016 to June 2016.

*Sample size:* The sample size was calculated using the formula \(4pq/l^2\), where \(p\) is the prevalence, \(q\) is \((1 - q)\), and \(l\) is the allowable error. Taking 48% prevalence\textsuperscript{[12]} of more than average knowledge of BPACR and a relative allowable error of 15%, the sample came out to be 193, which was rounded off to 200.

*Sampling technique:* Twenty subcenters in the rural block were studied. Five subcenters were selected randomly. From these 5 subcenters, list of eligible study subjects was obtained and equal number of participants (40) were taken randomly on the replacement basis.

Participants who gave consent and had delivered a child in the last 6 months were included in the study.

A predesigned and pretested schedule containing both close and open-ended questions adapted from survey tools of JHPIEGO MNH Program was used to collect data.\textsuperscript{[8]} Data regarding sociodemographic profile, socioeconomic status using Uday Pareek Scale, parity, antenatal care (ANC), knowledge of danger signs during pregnancy, labor and 2 days after delivery, newborn danger signs, identification of place and personnel for delivery, plan of arranging transport, and money for delivery were obtained. The interview was carried out in the language the study participants understood.

BPACR index was calculated from the following indicators:
- Women who knew about >8 danger signs of pregnancy
- Women who knew about financial assistance provided by government in Janani Suraksha Yojana (JSY)
- Women who knew about transportation provided by government in JSSK
- Women who availed ANC in first trimester by skilled provider
- Women who identified skilled birth attendant for delivery
- Women who identified mode of transportation
- Women who saved money to pay for expenses.

BPACR index was calculated as \(\sum \text{Indicator}/7\).

The mothers who fulfilled at least four BPACR practices were considered as “well prepared” and the rest of them were “less prepared.”\textsuperscript{[13]}

The collected data were entered into an excel spreadsheet and analyzed using SPSS v 20 for Windows. Frequencies, percentages, Chi-square test, and regression analysis were carried out where appropriate.

**Results**

In our study, 200 mothers who had given birth in the last 6 months were taken. Majority of them were in the age group 23–27 years (60.5%), illiterate (31%), and unemployed (74.5%) [Table 1].

Majority of the participants belonged to lower middle socioeconomic status (51.5%) and had >5 family members (77%). Most of them belonged to other backward caste (36.5%) [Table 1].

It was seen that among the BPACR indicators, >8 danger signs were known only to 9.5% participants. Approximately 95% participants had identified skilled birth attendant for delivery [Table 2].

BPACR index came out to be 66.93.

Overall, 117 (58.5%) women were well prepared by fulfilling at least 4 indicators and the rest [83 (41.5%)] were less prepared.

It was observed that among the sociodemographic factors, participant’s education (\(P = 0.010\)), participant’s occupation (\(P = 0.002\)), socioeconomic status (\(P = 0.005\)), caste (\(P = 0.017\)), family members (\(P = 0.001\)), and husband’s education (\(P = 0.016\)) had a statistically significant association with BPACR [Table 3].

Table 4 represents the independent association of various factors to BPACR on applying binomial logistic regression. It was observed that with higher level of education among participant’s husband, the odds of BPACR increased. Among the
Discussion

BPACR is a strategy that advocates timely use of skilled maternal and neonatal health-care services, especially during the intrapartum period, as preparing for childbirth reduces delays in obtaining this care. Birth preparedness component motivates people to plan to have a skilled provider at every birth, which ensures that the woman will reach care before developing any potential complications during childbirth, thus avoiding delays. Complication readiness component aims at raising awareness and recognition of danger signs and reducing the delay in deciding to seek care.

In our study, BPACR index came out to be 66.93. More than half (58.5%) women were found to be well prepared by fulfilling at least four indicators. BPACR index of our study was higher than that observed by Patil et al.[7] (55.83%), Gupta et al.[8] (46.2%), Acharya et al.[9] (41%), Mazumdar et al.[10] (49.4%), and Mukhopadhyay et al.[11] (34.5%).

In the study by Rajesh et al.[12] and Agarwal et al.[13] only 35.5% and 47.8% women, respectively, were found to be well prepared, which is lower in comparison to our study. Our study finding corroborated with the findings of Mandal et al.,[14] who reported that 57% women were well prepared.

The linkage of referral transport scheme with utilization of antenatal and intra-natal services along with lack of awareness might be the reason, especially among poor and marginalized women. Poor BPACR has the potential to negatively influence the maternal and child health outcomes, as women who are not well prepared are less likely to utilize skilled birth attendants at delivery or respond to complications in an appropriate or timely manner.

In our study, it was observed that only 9.5% women knew more than eight danger signs. This is more in comparison to the findings of Rajesh et al.[12] who reported that no woman had knowledge of at least eight danger signs. However, the findings of both studies are dismal as they suggest that many pregnant women may not understand the implications or severity of these signs, should they occur, to avoid delays that may arise if they need special care during pregnancy and delivery.

In our study, it was observed that the participants had a good knowledge about the components of the schemes – JSY (80%) and JSSK (83%) – run by the government. This is comparable to the knowledge about financial benefits (84.6%) among the study subjects in study by Saha et al.[15] In contrast, the knowledge...
about financial assistance was found to be low (37.2%) among study subjects in the study by Acharya et al.\[19\]. These findings indicate a need to scale up the information, education, and communication activities.

In our study, 77.5% of the participants availed ANC service in the first trimester. Our findings are closely similar to the findings of Mukhopadhyay et al.\[18\] and Gupta et al.\[19\]. However, in the study by Rajesh et al.,\[20\] 97% women had their ANC started in the first trimester. Early registration of pregnancy results likely in a safer pregnancy and positive outcome. Besides, ANC visits can be utilized as an opportunity to make women aware of BPACR and its importance.

Identification of a skilled attendant for delivery and identification of transport are vital to BPACR. In our study, 94.5% had identified a skilled attendant and 68% had made arrangements for transport to deal with any emergency. Fifty-two percent women saved money to meet out the expenses during labor and childbirth. Comparable findings were observed in the study of Patil et al.\[7\]. However in the study by Rajesh et al.\[20\] in Tumkur, Karnataka, it was observed that very few participants had arranged for transport and money beforehand, although 99% had identified a skilled attendant for childbirth. Despite picking out the skilled attendant for birth, lack of money and transport facility pose a challenge to seek care and reach health facility in time.

Among the sociodemographic factors, participant's education and occupation, socioeconomic status, number of family members, and the education of husband of the participant were found to be significantly associated with the practice of preparedness of BPACR [Table 3]. On ascertaining the independent association of these factors with BPACR, better BPACR practices were observed among those belonging to upper socioeconomic status, dominant caste, having more than five family members, and where the husband has a higher educational status [Table 4]. These factors were not found to have a significant association with BPACR in the study by Mandal et al.\[17\]. This variance can be attributed to the difference in sample size and the sociodemographic variables of the study population.

Overall, 58.5% women were found to be well prepared on the account of BPACR components in our study. This is higher as compared to the level of preparedness among participants in the study by Mandal et al.\[17\]. This difference may be due to poor knowledge of danger signs, followed by lack of awareness about transport assistance in JSY and poor savings.

The limitation of this study was that the relation of mass media exposure, women's autonomy/decision-making power, and male participation in pregnancy and childbirth with BPACR were not studied.

### Conclusion and Recommendations

BPACR is a comprehensive strategy to ensure safer pregnancy and motherhood. In our study, BPACR index came out to be 66.93. Providing educational and skill acquisition opportunities for rural women for their empowerment and increasing their role in decision-making are imperative in order to improve BPACR and promote utilization of skilled attendants at every delivery. In addition to spousal and family support, the community also has a crucial part to play in ensuring that pregnant women are well prepared and ready for any complications that may occur as BPACR is a shared responsibility. Community groups may be formed that could provide education, information, and counseling regarding

### Table 3: Association of sociodemographic factors and level of preparedness of BPACR

| Characteristic           | Well prepared | Total (%) | Test result |
|--------------------------|---------------|-----------|-------------|
| Participants' education  |               |           |             |
| Illiterate               | 26 (41.9)     | 36 (58.1) | χ²=15.130   |
| Primary                  | 10 (33.3)     | 20 (66.7) | α=5         |
| Middle                   | 13 (56.5)     | 10 (43.5) | P=0.010     |
| Secondary                | 36 (65.5)     | 19 (34.5) |             |
| Higher secondary         | 15 (75)       | 5 (25)    |             |
| Graduate and above       | 5 (50)        | 5 (50)    |             |
| Occupation of participant|               |           |             |
| Unemployed               | 69 (46.3)     | 80 (53.7) | χ²=14.425   |
| Laborer                  | 24 (61.5)     | 15 (38.5) | χ²=4.19     |
| Cultivation              | 6 (100)       | 0 (0)     |             |
| Service                  | 6 (100)       | 0 (0)     |             |
| Husband's occupation     |               |           |             |
| Unemployed               | 11 (35.5)     | 20 (64.5) | χ²=8.137    |
| Laborer                  | 46 (49.5)     | 47 (50.5) | χ²=0.90     |
| Caste occupation         | 11 (55)       | 9 (45)    |             |
| Cultivation              | 19 (65.5)     | 10 (34.5) |             |
| Service                  | 18 (66.7)     | 9 (33.3)  |             |
| Socioeconomic status     |               |           |             |
| Lower                    | 13 (33.3)     | 26 (66.7) | χ²=13.018   |
| Lower middle             | 52 (50.5)     | 51 (49.5) |            |
| Middle                   | 38 (67.9)     | 18 (32.1) | P=0.005     |
| Upper middle             | 2 (100)       | 0 (0)     |             |
| Caste                    |               |           |             |
| SC                       | 33 (50.8)     | 32 (49.2) | χ²=10.208   |
| OBC                      | 33 (45.2)     | 40 (54.8) | D=5         |
| Prestige caste           | 23 (79.3)     | 6 (20.7)  | P=0.017     |
| Dominant caste           | 16 (48.5)     | 17 (51.5) |             |
| Family members           |               |           |             |
| <5                       | 34 (73.9)     | 12 (26.1) | χ²=10.984   |
| >5                       | 71 (46.1)     | 83 (53.9) |             |
| Husband's education      |               |           |             |
| Illiterate               | 10 (21)       | 21 (79)   | χ²=13.963   |
| Primary                  | 6 (11)        | 17 (89)   |             |
| Middle                   | 23 (9)        | 32 (91)   | P=0.016     |
| Secondary                | 30 (26)       | 56 (74)   |             |
| Higher secondary         | 16 (7)        | 33 (93)   |             |
| Graduate and above       | 20 (11)       | 31 (89)   |             |

Figures in parenthesis represent percentages. SC: Scheduled caste; OBC: Other backward caste.
Table 4: Independent association of factors associated with BPACR

| Variable               | df | Sig  | Adjusted Odd's Ratio |
|------------------------|----|------|----------------------|
| Husband's education    |    |      |                      |
| Illiterate*            | 5  | 0.011|                      |
| Primary                | 1  | 0.286| 0.37                 |
| Middle                 | 1  | 0.825| 0.81                 |
| Secondary              | 1  | 0.041| 5.42                 |
| Higher secondary       | 1  | 0.954| 1.1                  |
| Graduate and above     | 1  | 0.625| 0.72                 |
| Socioeconomic status   |    |      |                      |
| Lower*                 | 3  | 0.194|                      |
| Lower middle           | 1  | 0.102| 2.5                  |
| Middle                 | 1  | 0.032| 5.2                  |
| Upper middle           | 1  | 0.019| 12.4                 |
| Family members         |    |      |                      |
| <5*                    | 1  | 0.001| 6                    |
| >5                     | 1  | 0.008| 7.6                  |
| Caste                  |    |      |                      |
| SC*                    | 3  | 0.010|                      |
| OBC                    | 1  | 0.279| 2                    |
| Prestige caste         | 1  | 0.018| 8                    |
| Dominant caste         | 1  | 0.018| 8                    |

*Reference category: SC: Scheduled caste; OBC: Other backward caste

BPACR and financial assistance. Each ANC visit must be utilized to counsel on BPACR components.

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Conflicts of interest
There are no conflicts of interest.

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