Birth preparedness and complication readiness in pregnant women attending urban tertiary care hospital

Vasundhara Kamineni, Anuradha D. Murki, Venkata Lakshmi Kota

Department of Obstetrics and Gynaecology, KAMS and RC, Hyderabad, Telangana, India

**Abstract**

**Background:** Birth preparedness and complication readiness (BP/CR) is a strategy to promote the timely use of skilled maternal and neonatal care and is based on the theory that preparing for childbirth and being ready for complications reduce delay in obtaining care. **Study Objective:** The objective of this study was to evaluate the incidence and predictors of birth preparedness, knowledge on danger signs, and emergency readiness among pregnant women attending outpatient clinic of a tertiary care hospital. **Patients and Methods:** Six hundred pregnant women attending the outpatient department of a tertiary care hospital for the first time in an urban setting were interviewed using a tool adapted from the “Monitoring BP/CR tools and indicators for maternal and newborn health” of the “JHPIEGO.” The outcomes of the study were birth preparedness, knowledge of severe illness, and emergency readiness. **Results:** Six hundred pregnant women were in the study. Mean age of respondents was 25.2 (±4) years. The mean gestation at enrolment was 18.7 ± 8 weeks. Among the women who participated in the survey, 20% were illiterate, 70% were homemakers and nearly 70% had a monthly family income >Rs. 15,197 (n = 405). Three hundred and sixteen mothers (52%) were primigravida. As defined in the study, 71.5% were birth prepared. However, 59 women (9.8%) did not identify a place of delivery, 102 (17%) had not started saving money, and 99 mothers (16.5%) were not aware of purchasing materials needed for delivery. The predictors of birth preparedness are multiparity (odds ratio [OR]: 2.2, 95% confidence interval [CI]: 1.4–3.1), registration in the antenatal clinic in the first trimester (OR: 3.7, 95% CI: 2.2–6.1), educational status of women (OR: 1.9, 95% CI: 1.2–3.0), and pregnancy supervision by a doctor (OR: 5, 95% CI: 2.8–6.6). One hundred and sixty-four women (27%) made no arrangements in the event of an emergency, 376 women (63%) were not aware of their blood group, and 89% (n = 531) did not identify any blood donor. Only 20% (n = 120), 15.8% (n = 95), and 12% (n = 73) of the respondents had knowledge of at least 3 danger signs of pregnancy, labor, and severe illness in newborn, respectively. **Conclusions:** Nearly three-fourth pregnant women attending a tertiary care hospital in an urban area are birth prepared. However, emergency readiness and awareness of danger signs are very poor. Maternal education and early booking have an independent association with birth preparedness.

**Keywords:** Birth preparedness, complication readiness, pregnancy

**Introduction**

Birth preparedness and complication readiness (BP/CR) is a strategy to promote the timely use of skilled maternal and neonatal care, especially during childbirth, based on the theory that preparing for childbirth and being ready for complications reduce delay in obtaining care. Thaddeus and Maine outlined three delays that influence the provision and use of obstetric services (a) delay in deciding to seek care when complication occurs; (b) delay in reaching facility; and (c) delay in receiving care. Women with more education and those aware of obstetric complication are more prepared for birth and complications if emerged then illiterate women. BP/CR is one intervention that addresses these delays by encouraging pregnant women, their families, and communities to effectively plan for births and deal with emergencies if they occur. At the basic level, the concept of BP/CR includes identifying a trained birth attendant for delivery, identifying a health facility for emergency, arranging for transport for reprints contact: reprints@medknow.com
Patients and Methods

All pregnant women attending the outpatient clinics for the first time at Kamineni Hospital, Hyderabad, during the study period from October 2012 to September 2014 were eligible for this study. After obtaining an informed consent, each of the mothers was recruited in the study. A semistructured, interviewer-administered questionnaire was used to obtain relevant study data from the recruited women. Trained assistants helped the women on vernacular translation of the keywords’ record keeping. The interview schedule was translated from English to Telugu/Hindi to improve the validity and reliability. The interviews were periodically evaluated and relevant modifications were carried out. The interview schedule was predominately adapted from the “Monitoring birth preparedness and complication readiness tools and indicators for maternal and newborn health” of the “JHPIEWHO.”

Data obtained from respondents included sociodemographic data and baseline variables, namely, age in completed years, religion, duration of formal education, occupation, total family income, place of residence, registration to antenatal care (ANC), period of gestation at outpatient clinic visit, knowledge of expected date of delivery and parity. Perception and practices regarding BP/CR of study subjects were assessed with a pilot-tested, semistructured questionnaire. Severe vaginal bleeding, swollen hands/face, and blurred vision were considered as key danger signs of pregnancy. Severe vaginal bleeding, prolonged labor, convulsions, and retained placenta were considered as key danger signs of labor. Key danger signs of neonates were convulsion, difficult/fast breathing, very small baby, lethargy/unconsciousness, and unable to suck/drink during first 7 days of life.

Composite variables derived from the responses to various questions were used to determine adequate knowledge of signs of severe illness, birth preparedness, and emergency readiness of the respondents. A woman had adequate knowledge of signs of severe illness if she was able to mention three or more of the signs of severe illness enumerated in the questionnaire spontaneously without prompting. A woman was classified as birth prepared if she had identified a place of delivery, had saved money toward delivery, and had commenced purchase of materials needed for delivery. A woman was classified as emergency ready if she was aware of her blood group, had identified a blood donor, and made adequate arrangements for transport in emergencies.

Outcomes

Birth preparedness, knowledge of severe illness, and emergency readiness are the primary outcomes of this study.

Statistics

Data collected were cleaned and edited manually and with the aid of the computer. Determinants of the birth preparedness were evaluated from a univariate analysis and independent association was derived from the logistic regression analysis for birth preparedness.

Results

A total of 600 women were included in the study [Figure 1]. Mean age of respondents was 25.2 (±4) years. Thirty-four pregnancies were teenage and 17 were elderly pregnancies. The mean gestation at enrolment was 18.7 ± 8 weeks. Nearly 35% and 50% of the respondents had first attended our outpatient clinic in the first and second trimester, respectively. Among the women who participated in the survey, 20% were illiterate, 44.5% had only primary education, and 35.5% were graduates. Seventy percent of the women were homemakers (n = 417) and nearly 70% of women had a monthly family income >Rs. 15,197 (n = 405) and were residing in urban area (n = 416). Majority of the mothers belonged to Hindu religion (n = 371). Three hundred and sixteen mothers were primigravida.

Birth preparedness

The mean gestational age at enrolment in the study was 18.6 ± 8 weeks. 84% of the respondents were registered in an antenatal clinic before 12 weeks of gestational age and...
77% (n = 462) were supervised by a qualified doctor before the visit to our hospital. Fifty-nine women did not identify a place of delivery, 102 had not started saving money, and 99 mothers were not aware of purchasing materials needed for delivery. However, as defined in the methods, 429 mothers (71.5%) were birth prepared. In the order of decreasing frequency, the decision on the place of delivery was made by parents (n = 261), husband (n = 212), in-laws (n = 94), and the respondent herself (n = 33).

On univariate analysis, the predictors of birth preparedness were primary education or graduation, working women, high monthly family income, early registration in ANC clinic, pregnancy supervision by a doctor, and multiparous status [Table 1]. However, on regression analysis, the predictors of birth preparedness were multiparity (Odds ratio [OR]: 2.2, 95% confidence interval [CI]: 1.4–3.1), registration in the antenatal clinic in the first trimester (OR: 3.7, 95% CI: 2.2–6.1), educational status of women (OR: 1.9, 95% CI: 1.2–3.0), and pregnancy supervision by a doctor (OR: 5, 95% CI: 2.8–6.6).

**Emergency readiness**

One hundred and sixty-four women (27%) made no arrangements in the event of an emergency, 376 women (63%) were not aware of their blood group, and 89% (n = 531) did not identify any blood donor in case of any emergency. Hence, majority of the mothers (n = 566, 94.3%) were not ready for any unexpected emergencies during pregnancy.

**Knowledge on signs of severe illness**

Twenty-nine percent, 42% and 48% of the respondents had no knowledge of the danger signs in pregnancy, signs of severe conditions in labor, and serious health problems that occur to newborns in the first 7 days of life, respectively. Only 20% (n = 120), 15.8% (n = 95), and 12% (n = 73) of the respondents had knowledge of at least 3 dangers signs of pregnancy, labor, and severe illness in newborn, respectively.

**Discussion**

In this study from an urban tertiary care referral center, birth preparedness is higher than that reported from other settings in India and other developing countries.[3-7,10] This finding is a reflection of the increased awareness for institutional delivery and national programs promoting safe delivery among the urban pregnant women.[18] Similar to other studies[9] on this issue, a significant proportion of the respondents was aware of purchasing of materials needed for delivery and were saving money.

In this study, among the three issues evaluated, women were more birth prepared than having knowledge on severe illness or emergency readiness. Majority (>90%) of the women were not emergency ready and many mothers were not aware of the severe illness during pregnancy, child birth, and postnatal period. This finding might be due to the fact that most pregnant women do not want to anticipate undesirable events in pregnancy and delivery; hence, they make no plans for emergencies, hoping and believing that everything will be normal. The inadequate knowledge on signs of severe illness is worrisome and this brings to the fore the content and quality of health education and counseling services provided by health-care workers during antenatal clinic sessions or may be the women are ignorant of the importance and benefits of the health education sessions and hence do not avail themselves the opportunity of participating in these sessions. Similar to our results, in the study from New Delhi, among the 417 pregnant women attending a primary health-care center, birth preparedness (48.9% saved money) was better than the emergency readiness (44% arranged transport) or awareness about danger signs during pregnancy or labor (28% knew of any danger signs in labor). Similar is the trend in other studies that report birth preparedness and emergency readiness in other parts of India[9] or from outside our country.[3-5,9]

Among the predictors for birth preparedness as expected educational status and parity would have a positive role as women with education and those with experience are more likely to be prepared for birth of a new baby. Early registration and supervision by a doctor may lead to exposure of these women to multiple counseling sessions in ANC clinics or better counseling by doctors in comparison to other health workers. However, high family income and working status did not affect the birth preparedness unlike some other studies. Family income and working status did not have an independent effect on the birth preparedness in our study. Most studies report maternal education, early booking, and prior antenatal visits as important predictors of birth preparedness as in our study.[6,8,10] However, unlike our study and that from Delhi, primiparous women were better birth prepared compared to multiparous women in the study from Madhya Pradesh.

A lesser proportion of the respondents in our study were aware of their blood group and even fewer had made arrangement for blood donors, our findings are comparable to other studies done in India,[9,10] Nepal,[11] Ethiopia,[10] and Nigeria.[12] May be, most women think pregnancy is a normal condition and a critical situation such as blood transfusion is unlikely to occur during

| Table 1: Predictors of birth preparedness |
|----------------------------------------|
| Variable                               | Yes (n=429) | No (n=171) | P    |
| Primi                                  | 213 (49.7)  | 103 (60.2) | 0.02 |
| Homemaker                              | 283 (66)    | 134 (78)   | 0.01 |
| Illiterate                             | 63 (15)     | 56 (33)    | <0.001 |
| Income <Rs.15,197                      | 120 (28)    | 75 (44)    | <0.001 |
| Urban residence                        | 298 (70)    | 118 (69)   | 0.91 |
| ANC registered <12 weeks               | 383 (89)    | 123 (79)   | <0.001 |
| Supervised by a doctor                 | 370 (86)    | 92 (54)    | 0.001 |
| Self-decision on place of delivery     | 26 (6)      | 7 (4)      | 0.45 |

ANC: Antenatal care
pregnancy or labor. Although most Indian women are anemic, many are unaware of their hemoglobin status.

Knowledge of the signs of severe illness during pregnancy and labor enables women to take appropriate action to access emergency care. In this study, the knowledge on signs of severe illness is better than that reported from other studies. Differences in the educational status, socioeconomic status, urban setting, and timing of the interview may be reasons for the differences noted on this aspect of the study.

Conclusions

Nearly three-fourth pregnant women attending a tertiary care hospital in an urban area are birth prepared. However, emergency readiness and awareness of danger signs during pregnancy, labor, or neonatal period are very poor. Maternal education and early booking have an independent association with birth preparedness.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Thaddeus S, Maine D. Too far to walk: Maternal mortality in context. Soc Sci Med 1994;38:1091-110.
2. JHPIEGO. Maternal and Neonatal Health Program. Birth Preparedness and Complication Readiness: A Matrix of Shared Responsibilities. Baltimore: JHPIEGO; 2001.
3. Nawal D, Goli S. Birth preparedness and its effect on place of delivery and post-natal check-ups in Nepal. PLoS One 2013;8:e60957.
4. Moran AC, Sangli G, Dineen R, Rawlins B, Yaméogo M, Baya B. Birth-preparedness for maternal health: Findings from Koupéla District, Burkina Faso. J Health Popul Nutr 2006;24:489-97.
5. Belda SS, Gebremariam MB. Birth preparedness, complication readiness and other determinants of place of delivery among mothers in Goba District, Bale Zone, South East Ethiopia. BMC Pregnancy Childbirth 2016;16:73.
6. Gupta A, Malhotra S. Should birth preparedness and complication readiness (BPCR) interventions be scaled up in developing countries? Natl Med J India 2014;27:327-8.
7. 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;40:127-34.
8. Kushwah SS, Dubey D, Singh G, Shivdasani JP, Adhish V, Nandan D. Status of birth preparedness & complication readiness in Rewa District of Madhya Pradesh. Indian J Public Health 2009;53:128-32.
9. 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;28:383-91.
10. Gebre M, Gebremariam A, Abebe TA. Birth preparedness and complication readiness among pregnant women in Duguna Fango District, Wolayta Zone, Ethiopia. PLoS One 2015;10:e0137570.
11. Bintabara D, Mohamed MA, Mghamba J, Wasswa P, Mpembeni RN. Birth preparedness and complication readiness among recently delivered women in Chamwino District, central Tanzania: A cross sectional study. Reprod Health 2015;12:44.
12. Ekabua JE, Ekabua KJ, Oduesolu P, Agan TU, Iklaki CU, Etokidem AJ. Awareness of birth preparedness and complication readiness in Southeastern Nigeria. ISRN Obstet Gynecol 2011;2011:560641.
13. Vellakkal S, Gupta A, Khan Z, Stuckler D, Reeves A, Ebrahim S, et al. Has India’s national rural health mission reduced inequities in maternal health services? A pre-post repeated cross-sectional study. Health Policy Plan 2016. pii: czw100. [Epub ahead of print].
14. Mukhopadhyay DK, Mukhopadhyay S, Bhattacharjee S, Nayak S, Biswas AK, Biswas AB. Status of birth preparedness and complication readiness in Uttar Dinajpur District, West Bengal. Indian J Public Health 2013;57:147-54.
15. Toteja GS, Singh P, Dhillon BS, Saxena BN, Ahmed FU, Singh RP, et al. Prevalence of anemia among pregnant women and adolescent girls in 16 districts of India. Food Nutr Bull 2006;27:311-5.