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CLINICAL ARTICLE

Profile of pregnant women using delivery hut services of the Ballabgarh Health and Demographic Surveillance System in rural north India

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ABSTRACT

Objective: To describe women who attended two delivery huts in rural Haryana, India. *Methods:* The present observational study assessed routinely collected service provision data from two delivery huts located at primary health centers in the district of Faridabad. Data on sociodemographic characteristics, prenatal care, use of free transport services, and maternal and neonatal indicators at delivery were assessed for all pregnant women who used the delivery hut services from January 2012 to June 2014. *Results:* During the study period, 1796 deliveries occurred at the delivery huts. The mean age of the mothers was 23.3 ± 3.3 years (95% confidence interval 23.1–23.5). Of 1648 mothers for whom data were available, 1039 (63.0%) had travelled less than 5 km to the delivery hut. The proportion of mothers who belonged to a lower caste increased from 31.0% (193/622) in 2012 to 41.1% (162/394) in 2014. The proportion of mothers who were illiterate also increased, from 8.1% (53/651) in 2012 to 26.4% (104/394) in 2014. *Conclusion:* Belonging to a disadvantaged social group (in terms of caste or education) was not an obstacle to use of delivery hut services. The delivery huts might have satisfied some unmet needs of community members in rural India.

1. Introduction

Skilled attendance at birth is associated with reduced maternal mortality [1]. The decrease in the maternal mortality ratio associated with skilled attendance at birth is largely attributed to the timely identification and management of complications. Most complications occur during labor, delivery, or the first 24 hours after delivery [2], but it is difficult to predict which pregnant woman might develop them and when. Even with the best possible prenatal screening, any delivery could become complicated and therefore require emergency intervention. Thus, ensuring optimum intrapartum care is important. It could be achieved if delivery takes place in an institution, which can provide a safe and clean delivery environment along with early identification and management of complications.

The proportion of institutional deliveries—i.e. those occurring under the overall supervision of trained and competent health personnel in a medical institution where there are amenities available to monitor the situation and save the life of the mother and newborn if necessary—in rural India was 48% in 2005 [3], and only 42% in the state of Harayana [4]. To improve institutional delivery in Haryana, a delivery hut service was launched in 2005–2006 [5]. As part of this service, delivery rooms were established in rural areas with the objective of providing local and safe delivery services in a clean, hygienic, and woman-friendly environment. The key elements were free delivery services in a private patient-friendly environment, family welfare counseling and an immunization package for mother and newborn, early diagnosis of complications, and an arrangement for referral. The delivery huts aimed to provide all the components of basic essential obstetric care, along with standard protocols to monitor and manage labor.

In addition to medical care, a pregnant woman requires both emotional and physical support during childbirth. Women feel secure and safe in the vicinity of their own home [6]; therefore, the delivery huts were established within villages and had the facilities required for normal delivery and for referral arrangements.

To date, the beneficiaries of the delivery hut services have remained largely unknown. The aim of the present study was to describe the profile of women who have used two delivery huts in the district of Faridabad, Haryana.

2. Materials and methods

The present observational study assessed service provision data that were routinely collected at two delivery huts located at two primary health centers (PHCs) in rural Haryana, India, between January 1, 2012, and June 30, 2014. The PHCs were part of the Ballabgarh Health and Demographic Surveillance System (HDSS; also known as the Comprehensive Rural Health Services Project), Ballabgarh, north India,

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which was established in 1965 to develop a model for rural healthcare practice. Ethical approval was not required because the study was an analysis of service data. Personal identifiers were delinked from the final database before commencing analysis.

The Ballabgarh HDSS has two PHCs and one subdistrict level hospital at Ballabgarh. The two PHCs—Dayalpur and Chhainsa—are situated 10 and 20 km, respectively, from Ballabgarh. The PHCs provides comprehensive primary healthcare services to 28 villages, through a network of 12 subcenters. Medical officers and auxiliary nurse midwives of the HDSS reside within the campus of the PHCs. Four additional staff nurses from the State Government of Haryana became available exclusively for delivery hut services in 2011. As of December 2013, a population of approximately 93 000 was covered by the Ballabgarh HDSS. The Ballabgarh HDSS has been described in detail previously [7].

The present assessment included data for all pregnant women who used the services of delivery hut during the study period. Data were collected on sociodemographic characteristics, prenatal care, use of free transport services, maternal and neonatal indicators at delivery, and details of referral to higher centers.

In the Ballabgarh HDSS area, the predominant castes (social hierarchal groupings characteristic of India) are Rajputs and Pandits (upper caste), Jats, (middle caste), and Scheduled Castes or Scheduled Tribes (SC/ST; lower caste). For the present study, upper caste was classified as a "general" category and middle caste as "other backward classes" (OBC).

Data were analyzed in Stata version 12 (StataCorp, College Station, TX, USA). Frequency tables were generated, and a year-wise comparison of variables such as caste, literacy status of pregnant women, birth weight, length of pregnancy, hemoglobin level at time of delivery, and utilization of free ambulance services was performed using χ^2 test or one-way analysis of variance. $P<0.05$ was considered to be statistically significant.

3. Results

During the study period, 1796 pregnant women used the delivery services at the delivery huts of the two PHCs. Table 1 shows their characteristics. The total number of deliveries at the two delivery huts gradually increased over the study period (Table 1).

Table 1
Service provision data and characteristics of women using the delivery hut services.[a]

Variable	Value (n = 1796)
Deliveries	
2012	651 (36.2)
2013	751 (41.8)
2014 (Jan–Jun)	394 (21.9)
Caste	
General	931 (51.8)
OBC	208 (11.6)
SC/ST	622 (34.6)
Not recorded	35 (1.9)
Distance of residence from delivery hut, km (n = 1648)	
<5	1039 (63.0)
5–10	551 (33.4)
>10	58 (3.5)
Belonged to HDSS	
Yes	1419 (79.0)
No	377 (21.0)
Maternal age, y	23.3 ± 3.3 (23.1–23.5)
General caste	23.2 ± 3.2 (23.0–23.4)
OBC	23.2 ± 3.5 (22.7–23.6)
SC/ST	23.5 ± 3.4 (23.2–23.8)
Monthly income, Indian rupees	5246.1 ± 3964.2 [b]
Mode of transport to primary health center (n = 934)	
Ambulance	663 (71.0)
Own vehicle	271 (29.0)
Mode of transport to home (n = 934)	
Ambulance	932 (99.8)
Own vehicle	2 (0.2)

Abbreviations: OBC, other backward classes; SC/ST Schedule Castes or Scheduled Tribes; HDSS, Health and Demographic Surveillance System.
[a] Values are given as number (percentage) or mean ± SD (95% confidence interval).
[b] Mean value corresponds to approximately US$78.

More than three-quarters of the pregnant women who had used the delivery hut services (79.0%) resided in the Ballabgarh HDSS area (Table 1). To reach the delivery hut, the women had travelled a mean distance of 3.8 ± 3.5 km (95% confidence interval [CI] 3.6–3.9). Most women had come from within a 5-km radius of the delivery hut (Table 1). The mean distance between residence and delivery hut was 3.6 ± 3.6 km (95% CI 3.4–3.9), 3.8 ± 3.3 km (95% CI 3.4–4.3), and 3.8 ± 3.3 km (95% CI 3.6–4.1) for women in the general, OBC, and SC categories, respectively.

The proportion of pregnant women in each caste varied significantly by year ($P=0.004$) (Table 2). The proportion of women who were illiterate among all pregnant women utilizing the delivery hut services increased significantly over the 3-year study period ($P<0.001$) (Table 2). The mean family income of the pregnant women increased from 4261.4 Indian rupees (INR) in 2012, to INR5340.4 in 2013, and INR5804.6 in 2014. The proportion of women with a family income of INR5000 or more increased significantly between 2012 and 2014 ($P<0.001$) (Table 2). Use of free ambulance transport also improved significantly ($P<0.001$) (Table 2).

Over the 3-year study period, pregnant women living further away began to use the services as was evident from the increase in mean distance covered to reach the delivery hut ($P=0.0011$) (Table 2).

Both an improvement in clinical variables, such as hemoglobin level at the time of delivery, and a reduction in the proportion of preterm deliveries were observed over the study period, but the changes were not significant (Table 3). The proportion of neonates of low birth weight did decrease significantly in the 3 years ($P=0.008$) (Table 3).

4. Discussion

The present study has described the profile of pregnant women who delivered at two delivery huts in rural north India. Over the 3-year study period, there was a sustained increase in the number of deliveries at the two delivery huts. The services successfully reached pregnant women belonging to disadvantaged caste groups, in addition to those from higher castes. There was also a significant increase in the proportion of women attending the huts who were illiterate over the study period.

A literature search did not yield any published data on the profile of women using delivery huts even though the service has been functional in India since 2007. Thus, the present study provides early information on the characteristics of pregnant women who are using the delivery huts.

Although the gradual increase in numbers of women utilizing services at these delivery huts is encouraging, it is important to interpret the data carefully. It is possible that these women did not have any other alternative option for institutional delivery, and hence were forced to choose the delivery hut services. If that is the case, then it is heartening that the availability of delivery hut services has widened the choices available to women who have no other options. This would be particularly beneficial for the weaker sections of the society. Thus, it might be reasonably concluded that the availability of delivery huts at these PHCs has met the previously unmet needs of the some community members.

Pregnant women with no viable delivery options could be forced to accept care of a less than satisfactory quality. At present, however, it is not possible to comment on perceived quality of care. The number as well as the overall proportion of women with a high monthly income who used delivery hut services increased during the study period. These women are likely to have had the option to access private healthcare facilities. Thus, economic constraints alone might not have been a deciding factor in choosing the delivery hut services, which were provided free of cost. As a result, it could be concluded that the perceived quality of care provided at the delivery huts must have met their expectations.

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