

Determinants of Home Delivery among Mothers in Urban and Rural Vadodara District, Gujarat, India

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Abstract

Background: Maternal health is severely affected by home deliveries because it contributes to maternal mortality, especially if home births are not made safer. **Objectives:** The present study aimed to assess the determinants of home delivery among mothers in urban and rural Vadodara district, Gujarat. **Materials and Methods:** This community-based, cross-sectional study was carried out during April 2017–July 2017. The mothers who delivered at home and hospital in urban and rural Vadodara district between April 15 and March 16 were included in the study. A semi-structured questionnaire was used for interviewing all the mothers. Information regarding sociodemographic and obstetrics characteristics of mothers was recorded. The study finding was presented in the form of frequencies and percentages, and the association was found with Chi-square test. $P \leq 0.05$ was considered statistically significant. **Results:** The present study was carried out among 138 mothers, of them, 71.7% were in the age group of 20–25 years. The mean age of mothers was 24.5 ± 4.4 years. The analysis of sociodemographic and obstetric factors revealed that mothers age more than 25 years, mothers from nuclear family, illiterate mothers, late antenatal care registration by mothers, mothers not registered in Janani Suraksha Yojna/Chiranjeevi Yojana scheme, and prior experience of home delivery by mothers were significantly associated with home delivery ($P < 0.05$ each). **Conclusions:** This study highlighted that several sociodemographic and obstetrics determinants related to mother were associated with home delivery in the study setting. Taking these findings into consideration, it is recommended that appropriate maternity services should be designed with a special focus on poor, uneducated, and multiparous women as well as it should ensure early registration of pregnancy for every pregnant woman. Institutional delivery should be encouraged and advocated among mothers having all previous deliveries at home.

Keywords: Determinants, Gujarat, home deliveries, mothers, Vadodara

INTRODUCTION

The estimated maternal mortality ratio (MMR) in 2015 at a global level was 216/100,000 live births, about 99% of these deaths occur in developing countries. India alone contributed to 19% of maternal death in the world.^[1] The target for Millennium Development Goal-5 is to reduce the MMR by three-quarter between 1990 and 2015.^[2] As per the recent Sustainable Development Goals, India is committed to reducing its MMR to <70 /lakh live births by 2030.^[3] The World Health Organization reported that the use of health-care facilities to deliver babies significantly decreases maternal mortality.^[4]

According to the District Level Household and Facility Survey-3, 2007–2008, in India, 52.3% of births take place at home, and of these, only 5.7% of births are attended by a

skilled person. This figure shows that the high proportion of births in the country is still being undertaken by an unskilled person.

To increase institutional delivery, the Government of India has introduced a conditional cash transfer scheme, the Janani Suraksha Yojna (JSY) under which women who choose institutional delivery may claim a cash entitlement.^[5]

On account of various program strategies, the decreasing trend of home deliveries was seen in India and Gujarat from 2008

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to 2011: in 2008, 29.3% home deliveries in India and 16.7% in Gujarat, and in 2011, 18.3% home deliveries in India and 6.3% in Gujarat.^[6] According to the National Family Health Survey-4, the percentage of institutional births in India and Gujarat was 78.9% and 88.5%, respectively, in 2015–2016.^[7]

Although intranatal period constitutes only a small fraction (0.5%) of the maternity cycle, it is the most crucial period. Quality intranatal care is critical to achieve the aim of healthy mother and healthy baby at the end of the pregnancy.^[8] Maternal health is severely affected by home deliveries because it contributes to maternal mortality, especially if home births take place with compromised hygiene and without skilled birth attendants.^[9]

The link between maternal and infant mortality and the place of delivery is well established, as the place of delivery primarily determines the quality of care received by the mother and her newborn child.^[10] It is well established that giving birth in a medical institution promotes child survival and reduces the risk of maternal mortality. Home delivery aggravates maternal complications like post-partum hemorrhage, septic shock, puerperal pyrexia.^[11]

Information about the determinants of home delivery is necessary for health-care planners to design appropriate maternity services to ensure 100% institutional deliveries. Very little studies have been done to explore the determinants of home deliveries in India. This particular study was carried out therefore to assess the sociodemographic and obstetric determinants of home deliveries among mothers who delivered at home during April 15–March 16 in urban and rural Vadodara district, Gujarat.

MATERIALS AND METHODS

This community-based, cross-sectional study was carried out during April 2017–July 2017. The mothers who delivered at home and hospital in urban and rural Vadodara districts between April 15 and March 16 were included in the study. The records of these mothers were obtained from Monthly Grading Report for deliveries from District Panchayat Vadodara. As per the above data, there were 08 talukas and 44 Primary Health Centers (40 rural and 04 urban) 40 in Vadodara district.

Sampling technique

Convenience sampling was adopted for the selection of samples.

Sample size for home deliveries in rural area

On a convenient basis, two Primary Health Centers (PHCs) having home deliveries from each taluka were selected. Hence, a total number of PHCs selected from 8 taluka were 16. As one taluka reported home deliveries from only one PHCs, the total number of PHCs actually studied was 15. Thereafter, three home deliveries from each PHC were selected. Hence, the total number of home deliveries to be studied was 45. As four PHCs had reported two home deliveries each and one

PHC showed single home delivery, the total number of home deliveries actually studied was 39.

Sample size for home deliveries in urban area

Of four urban Health Centers (UHCs), it was found that only two UHCs reported home deliveries and out of them, one UHC reported only one home delivery. Hence, mothers from one UHC that showed 30 home deliveries were studied.

The number of home deliveries to be studied finally was 69 (39 rural and 30 urban).

Sample size for institutional deliveries

An equal number of institutional deliveries and home deliveries were studied. A mother who delivered at the institution and residing nearest to the house of the mother who delivered at home was studied.

Hence, the total number of deliveries to be studied came out to be 138 (69 home and 69 institutional).

Study population

The Study population included mothers who had delivered at home and institution during April 15–March 16 at District Panchayat Vadodara.

Inclusion criteria

Mothers who had delivered at home and institution during April 15–March 16 and consenting to give the interview were included in the study.

Exclusion criteria

Mothers who were absent at the time of the home visit or migrated and not willing to participate in the study were excluded from the study.

Methodology

Necessary clearances and permission for the study were obtained from the concerned authorities including Institutional Ethics Committee for Human Research (IECHR) and Scientific Review Committee (SRC) of the Medical College Baroda and SSG Hospital Gujarat.

After obtaining informed verbal consent, semi-structured questionnaire was used for interviewing all the mothers through the house-to-house visits. Information regarding sociodemographic and obstetric variables such as mother's age, type of family, religion, educational status, socioeconomic status, parity, history of antenatal care (ANC), and registration in Janani Suraksha Yojana (JSY)/Chiranjeevi Yojana (CY) scheme and places of delivery in previous pregnancies was recorded in predesigned and pretested proforma.

Statistical analysis

The collected data were entered into Microsoft Excel worksheet 2007, and the analysis was done using Epi Info 7 is statistical software for epidemiology developed by Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia (US). Percentages and frequency were used to describe sociodemographic and obstetric information, and association of different variables with the place of delivery was found

using Chi-square test. $P \leq 0.05$ was considered statistically significant.

RESULTS

A total of 138 mothers (69 mothers delivered at home and 69 mothers delivered at the hospital) were interviewed, of them, 71.7% were in the age group of 20–25 years. The mean age of mothers was 24.5 ± 4.4 years. The analysis of sociodemographic and obstetric factors revealed that mothers age more than 25 years, mothers from nuclear family, illiterate mothers, late ANC registration by mothers, mothers not registered in JSY/CY scheme, and prior experience of home delivery by mothers were significantly associated with preferring home as a place of delivery over hospital ($P < 0.05$ each). Although Hindu mothers, multiparous mothers, and mothers from above poverty line (APL) socioeconomic status, and <3 ANC visit by mothers also prefer a home as a place of delivery over hospital, there was no statistically significant difference seen in the above-mentioned variables between mothers delivered at home and hospital ($P > 0.05$ each) [Table 1].

DISCUSSION

The present study was done to explore the factors which affect the home delivery, among mothers in urban and rural areas of Vadodara district, Gujarat. The study findings revealed that the main sociodemographic and obstetrics determinant factors associated with place of delivery were mother's age,

type of family, educational status, ANC registration during last pregnancy, registration in JSY/CY scheme during the last pregnancy, and place of delivery during previous pregnancies. Other factors such as religion, socioeconomic status, parity, and ANC visits during the last pregnancy had no significant role in deciding the place of delivery.

The present study found that more than half (55.6%) of mothers up to age 25 years preferred hospital, while 64.1% of mothers more than 25 years preferred home as a place of delivery ($P = 0.03$). This could probably be due to the concern of younger mothers regarding their first pregnancy. However, in case older mothers, increasing parity with increased age has given them enough experience, so they may consider home delivery as an option. This finding was in agreement with other studies which showed that younger mothers were more likely to give birth in health institutions than older ones.^[12,13]

Type of family was another determinant factor found to be associated with home deliveries in the current study. Mothers from the nuclear family were more likely to prefer a home as a place of delivery as compared to the joint family (71.4% vs. 46.1%, $P = 0.03$). This could probably be due to less number of escorts available (to accompany pregnant mother) in a nuclear family. This finding was consistent with other studies which also found that home deliveries were more common in nuclear families than in the joint families.^[14-16]

As regards religion, the present study revealed that mothers from Hindu mothers were more likely to prefer a home as a place of delivery as compared to mothers from the Muslim

Table 1: Association of sociodemographic and obstetric variables with place of delivery among mothers having home deliveries and hospital deliveries

Variables	Category	Home delivery (n=69), n (%)	Hospital delivery (n=69), n (%)	Statistics (χ^2 , P)
Age group (years)	≤ 25	44 (44.4)	55 (55.6)	4.32, 0.03
	> 25	25 (64.1)	14 (35.9)	
Type of family	Joint family	54 (46.1)	63 (53.9)	4.54, 0.03
	Nuclear family	15 (71.4)	06 (28.6)	
Religion	Hindu	36 (57.1)	27 (42.9)	2.36, 0.12
	Muslim	33 (44)	42 (56)	
Educational status	Illiterate	31 (68.9)	14 (31.1)	9.52, 0.002
	Literate	38 (40.9)	55 (59.1)	
Socioeconomic status	BPL	47 (49.5)	48 (50.5)	0.03, 0.85
	APL	22 (51.2)	21 (48.8)	
Parity	Primipara	14 (36.8)	24 (63.2)	3.63, 0.06
	Multipara	55 (55)	45 (45)	
ANC registration during last pregnancy	Early*	48 (45.3)	58 (54.7)	4.06, 0.04
	Late [#]	21 (65.6)	11 (34.4)	
ANC received during last pregnancy	< 3 ANC visits	11 (55)	9 (45)	0.23, 0.62
	≥ 3 ANC visits	58 (49.2)	60 (50.8)	
Registration in JSY/CY scheme during last pregnancy	No	56 (57.1)	42 (42.9)	6.9, 0.008
	Yes	13 (32.5)	27 (67.5)	
Previous places of delivery	All deliveries at home	32 (94.1)	2 (5.9)	35.12, 0.000
	Any previous hospital delivery/no prior delivery	37 (35.6)	67 (64.4)	

*Early ANC registration: ANC registrations within first 3 months of pregnancy, [#]Late ANC registration: ANC registrations from 4th to 9th months of pregnancy. BPL: Below poverty line, APL: Above poverty line, ANC: Antenatal care, JSY/CY: Janani Suraksha Yojna/Chiranjeevi Yojana

community (57.1% vs. 44%), but this association was statistically not significant ($P = 0.12$). Hence, the religion was not a determining factor for home delivery in the present study. Similarly, a study by Pandey found no statistically significant association between the place of delivery and religion of the women.^[16]

Regarding the mother's education, it was observed that mothers who were illiterate were more likely to prefer a home as a place of delivery as compared to literates (68.9% vs. 40.9%, $P = 0.002$) in the current study. Hence, mother's education was also a determining factor of home delivery in the present study. Likewise in a study by Thind *et al.*, mothers who had primary or less education were delivered more in the home (55.9%) as compared to the public (28.8%) and private (15.3%) facilities.^[9] This finding was consistent with other studies that found that women who were illiterate were more likely to give birth at home.^[12,15,17-20] This could probably be due to the reason that illiterate mothers had a lack of adequate knowledge and importance of institutional deliveries and about the availability of JSY and CY facilities at government institutes. Hence, health education should be given to women with lower education about safe delivery and the use of health facility services for mothers.

Regarding the socioeconomic status, the present study found that more than two-third (68.8%) of the mothers were from below poverty line (BPL) families. In spite of the availability of free services at the hospital for the BPL class, almost half of the mothers (49.5%) from BPL socioeconomic class delivered at home. This finding indicates that there is a need to create awareness about free institutional delivery to these mothers and their families. The current study found that almost equal numbers of mothers among both APL and BPL class went to the hospital for delivery or preferred home delivery, and there was no statistically significant difference seen between socioeconomic status and place of delivery ($P = 0.85$). However, a study by Thind *et al.* found that mothers from a low household standard of living delivered more in the home (71.3%) as compared to the public (19%) and private (9.7%) facilities.^[9] Similarly, a study by Kotnis *et al.* also reported that 78.02% of the home deliveries were seen in social Class III and IV, while 8.79% were seen in social Class I.^[19]

Regarding the parity, the present study revealed that multiparous mothers (55%) were more likely to deliver at home as compared to primiparous mothers (36.8%), but there was no difference found between parity and place of delivery ($P = 0.06$). However, other studies found that multiparity was an important independent factor in determining the choice of home delivery.^[9,18,20,21]

Regarding the timing of ANC, the present study revealed that 76.8% of the mothers were registered early. Mothers who got registered late had preferred for home delivery as compared to mothers who got registered early (65.6% vs. 45.3%), and a significant difference was found between the time of ANC registration and mothers delivered at home

and hospital ($P = 0.04$). Mothers who were early registered preferred institutional (54.7%) over home deliveries (45.3%) in the current study. Consistent with the current study finding, other studies also found that mothers who were registered late were more likely to give birth at home as compared to mothers who were registered earlier.^[20,22,23] Early registration increases subsequent antenatal visits in mothers, so they get more chances to interact with the health professional at the health facility and know possible risks of pregnancy as well as aware of the importance of institutional delivery. Hence, early ANC registration should be encouraged by the sensitization of the community.

Regarding the ANC visits, the present study found that despite the high number (85.5%) of the mother who attended more than three ANC visits during the last pregnancy, a lot (49.5%) of mothers still preferred home delivery. Mothers with <3 ANC visits were more likely to deliver at home as compared to mothers with >3 ANC visits (55% vs. 49.2%), but no significant association was found between the number of ANC visits and mothers delivered at home and hospital ($P = 0.62$) in the current study. However, some studies found a significant association between availing the ANC services and planning the institutional delivery.^[12,17,20]

The present study finding revealed that mothers who were not registered in JSY/CY scheme were more likely to prefer a home as a place of delivery over hospital (57.1% vs. 42.9%, $P = 0.008$). This finding indicates that the registration in JSY/CY scheme had a large effect on the likelihood of giving birth in a health-care facility. This could probably be due to the mothers who were not registered in the JSY/CY scheme were less likely to know the benefits from JSY/CY scheme for being delivered in an institution. Hence, IEC activity about various maternity benefit schemes should be carried out regularly among illiterate and poor women.

The present study found that a previous place of delivery was the most important determining factor for the place of delivery. Mothers who had all previous home deliveries were more likely to prefer a home as a place of delivery as compared to mothers who had at least one previous hospital delivery or no prior delivery (94.1% vs. 35.6%), ($P = 0.000$). Consistent with this finding of the present study, other studies also found that mothers having all previous deliveries at home were more likely to prefer a home as a place of delivery over the hospital.^[13,20,24] Hence, prior experience of home delivery was the most important factor responsible for current home delivery in the present study. This study finding indicates that women's decision about the place of delivery was based on their past experience with previous deliveries. Mothers with previous good experience of home deliveries believed that they had enough experience with childbirth and they were not at risk of developing labor complications. Lack of awareness about the need and importance of institutional deliveries was an important reason for home deliveries. Thus, minimizing current home delivery will improve the institutional delivery

in future. Hence, optimum effort should be made to motivate all women to conduct delivery at the health-care facility.

CONCLUSIONS

This study highlighted that sociodemographic and obstetric determinants related to mother such as age more than 25 years, mothers from the nuclear family, illiterate mothers, late ANC registration, mothers not registered in JSY/CY scheme, and prior experience of home delivery by mothers were associated with home delivery in the study setting. Taking these findings into consideration, it is recommended that appropriate maternity services should be designed with a special focus on poor, uneducated, and multiparous women as well as it should ensure early registration of pregnancy for every pregnant woman. Institutional delivery should be encouraged and advocated among mothers having all previous deliveries at home. IEC activity about various maternity benefit schemes should be carried out regularly among illiterate and poor women. Emphasis should be given to increase female literacy to improve the rate of institutional delivery.

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Conflicts of interest

There are no conflicts of interest.

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