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**Original Research Article**

# Study to access the socio-demographic determinants and the reasons for preference of place of delivery in rural women of Paithan, Aurangabad (Maharashtra)

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## ABSTRACT

**Background:** Maternal health reflects the overall effectiveness of the health system of any country. One strategy for reducing maternal mortality and morbidity is ensuring that every baby is delivered in an institution. Government of India has launched various health schemes under the umbrella of National Rural Health Mission (NRHM) to promote institutional deliveries. Thus this study was conducted to study the socio-demographic determinants of place of delivery and the reasons for preference of place of delivery by rural women.
**Methods:** A community based cross-sectional study was conducted in the field practice area of rural health training center (RHTC), Paithan, Dist. Aurangabad during the period of 1st October 2015 to 31st March 2016. All the villages under two sub-centers of one PHC under the RHTC were selected for the study. All women above 18 years of age who delivered at least once between 1st January 2001 to 31st December 2015, were interviewed for their place of delivery and their socio-demographic profile.
**Results:** It was observed that 564 (80.46%) women were delivered in a hospital, of which 313 (44.65%) and 251 (35.81) were delivered in private and government institutions respectively, while 137 (19.54%) respondent women were delivered at home. Education of women, occupation of women, type of Family, education of husband, occupation of husband, parity, distance of hospital from the residence and women's age at marriage were the socio-demographic factors found to be significantly associated with place of delivery by the bivariate analysis. Reasons observed for home delivery were related to lack of knowledge about government healthcare facilities, about need for institutional delivery and inability to reach hospital on time.
**Conclusions:** The proportion of home deliveries in 2001-15 was 13.08% as against 35.80% of government institutional deliveries and 44.65% of private institutional deliveries. Education of women, education and occupation of husband were found to be significantly associated with place of delivery by multivariate analysis.

**Keywords:** Maternal health, Home deliveries

## INTRODUCTION

Maternal health reflects the overall effectiveness of the health system of any country. Poor maternal and child health due to child birth and its complications lead to a considerable amount of morbidity and mortality worldwide. Globally, 3,03,000 women were estimated to have lost their lives in 2015 from causes related to pregnancy and child birth, though this forms only the tip of the iceberg.[1] Along with maternal mortality, complications and disability leading to poor maternal and child health are also a matter of concern. The most tragic

truth about maternal deaths is that these are not caused by any disease but occurred during or after a natural process. Also, majority of these can be prevented if women have access to good quality antenatal, natal and post-natal care.[2]

Place of delivery is a crucial factor which affects the health and wellbeing of mother and newborn.[3] One globally recognized strategy for reducing maternal mortality and morbidity is ensuring institutional birth of every child.[3] Appropriate institutional setup for delivery services equipped with lifesaving equipments and hygienic conditions is important for maternal and child survival and welbeing.[4]

Proportion of deliveries conducted in government hospitals is still low, while care in private hospitals leads to high out-of-pocket expenditure. Taking this in view, Government of India and Maharashtra have launched various health schemes under the umbrella of National Rural Health Mission (NRHM) to promote institutional deliveries.[5–7] NRHM being implemented since 2005, focuses on expanding and strengthening of rural health services which is also an prerequisite for better natal care at government hospitals.[7]

The above mentioned health schemes along with better equipped health infrastructure under NRHM have led to increase in institutional deliveries, ultimately leading to lesser complications and maternal deaths. Various factors play a role in determining the place of delivery like maternal education and age, socioeconomic status, etc.[8] There is very limited research work to find out which factors affect the women's decision to choose place of delivery, especially the rural women.

Considering the above mentioned facts, this study aims at studying the socio-demographic factors determining the place of delivery and the reasons for preference of place of delivery in rural women.

### *Objective*

1. To know the socio-demographic factors determining place of delivery in rural women.
2. To study the reasons for preference of place of delivery (health institute and home) in rural women.

## METHODS

Present study was a community based cross-sectional study conducted in the field practice area of Rural Health and Training Center (RHTC) – Paithan of Government Medical College, Aurangabad (MS) from 1st July 2014 to 30st November 2016.

For the calculation of sample size, percentage of home deliveries in rural Maharashtra was taken as 13.3%.[9] Sample size was calculated by OpenEpi Software version 3. Thus the sample size derived was 304. Considering 10% of non-response rate, the sample size came to 334, which was further rounded off to 340.

### *Inclusion criteria*

1. All women of >18 years of age who had delivered at least once after 1st January 2001 to 31st December 2015.
2. Women who delivered at ≥28 weeks of gestation.

### *Exclusion Criteria*

1. Women who were not permanent resident of that area.
2. Women who refused to participate in the study.

Multistage sampling technique was used for the study. In the 1st stage, the investigator randomly selected one PHC covering population of 45,437 from the 3 PHCs of the field practice area of Rural Health Training Center (RHTC) of the Government Medical College Aurangabad. In the 2nd stage, 2 subcenters with villages under their service area were randomly selected from the selected PHC. Thus, a total of 9 villages with a population of 15635 and around 3 thousand households were included in the study.

At the 3rd stage, Probability Proportionate to Size (PPS) sampling was used to identify number of houses to be interviewed from each village. All women of >18 years of age, fulfilling the inclusion criteria were interviewed. Survey was started from one side of the village from any prominent landmark of that village. First house was selected by simple random sampling. Next houses were selected by systematic random sampling. The sampling interval for systematic random sampling was calculated from the total number of households and the desired sample size. Accordingly, every 13th house was included in the study. Information was collected accordingly for each delivery from respondent women who had delivered for one or multiple times since 1st January 2001to 31st December 2015.

Appropriate data analysis was performed using the MS Excel 2010, Open Epi version 3.03 and SPSS version 23 softwares.

## RESULTS

Data included a total of 340 respondent women having one or more children constituting a total of 701 births since 1st January 2001 to 31st December 2015. The socio-demographic profile of the respondent women is as shown in Table 1.

Private institutional deliveries accounted for 313 (44.65%) of the deliveries, 251 (35.80%) were government institutional delivery and 137 (19.54%) were home deliveries (Figure 1).

**Table 1: Socio-demographic characteristics of the women.**

| Parameter | Number | Percentage (%) |
|---|---|---|
| **Age (n = 340)** | | |
| ≤20 | 13 | 03.82 |
| 21 – 25 | 108 | 31.76 |
| 26 – 30 | 133 | 39.12 |
| 31 – 35 | 68 | 20.00 |
| ≥36 | 18 | 05.29 |
| **Religion (n = 340)** | | |
| Hindu | 272 | 80.00 |
| Muslim | 52 | 15.29 |
| Buddhist | 12 | 03.52 |
| Others | 4 | 01.18 |
| **Education (n = 340)** | | |
| Illiterate | 56 | 16.47 |
| Primary | 53 | 15.59 |
| Middle | 151 | 44.41 |
| High school | 49 | 14.41 |
| Inter/Diploma | 25 | 07.35 |
| Graduate | 6 | 01.76 |
| Professional | 0 | 00.00 |
| **Type of family (n = 340)** | | |
| Nuclear | 134 | 39.41 |
| Three generation | 113 | 33.23 |
| Joint | 93 | 27.35 |
| **Occupation (n = 340)** | | |
| Unemployed | 144 | 42.35 |
| Unskilled worker | 91 | 26.76 |
| Semi-skilled Worker | 0 | 00.00 |
| Skilled worker | 60 | 17.64 |
| Clerical / Shop / Farm | 3 | 00.88 |
| Semi-professional | 51 | 15.00 |
| Professional | 1 | 0.00003 |
| **Socio-economic status (n = 340)** | | |
| Class I | 8 | 02.35 |
| Class II | 6 | 01.76 |
| Class III | 38 | 11.18 |
| Class IV | 141 | 41.47 |
| Class V | 147 | 43.23 |

Different Socio-demographic variables were studied, of which 8 variables viz. education of mother, occupation of mother, type of family, education of husband, occupation of husband, parity, age of marriage and distance of nearest health facility were found to be statistically significant in bivariate analysis (Table 2).

To know the independent association of the variables with the place of delivery, the 8 variables significant in bivariate analysis were further analyzed by multiple logistic regression. Out of these 8 variables, 3 variables viz. education of women, occupation and education of husband, were found to be significantly associated with the place of delivery by Multiple Logistic Regression analysis. The Adjusted Odds Ratio (AOR) was found to be the highest for the Education of mother (3.96) followed by that of occupation of husband (2.76) and education of husband (0.74) (Table 2).

It was observed that of all the reasons given by the respondents for home delivery, the most commonly given reason was 'time constrain' (48.17%), followed by 'not needed (as no complications in previous delivery)' (44.52%) and 'hospital delivery not affordable economically' (39.42%). The most commonly given reason for govt. hospital delivery was that the government institute was 'Economically affordable' (80.08%), followed by 'nearer' (62.15%) and 'private hospital not available' (48.60%). The reasons given for private hospital delivery were 'good facilities' (92.97%), followed by 'promoted by family member' (70.93%) and 'transport facility available' (62.62%) (Table 3).

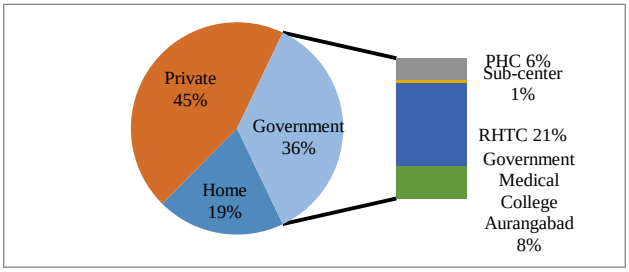


**Figure 1: Distribution of deliveries as per place of delivery.**

**Table 2: Socio-demographic characteristics and place of delivery of the women.**

| Socio-demographic variables | Private hospital delivery | Government hospital delivery | Home delivery | P-value | Multiple regression analysis | |
|---|---|---|---|---|---|---|
| | | | | | P-value | Adjusted odds ratio |
| **Socio-economic class** | | | | | | |
| Class I,II,III | 01 (20.00) | 04 (80.00) | 00 | 0.96 | -- | -- |
| Class IV | 08 (36.36) | 12 (54.55) | 02 (09.09) | | | |
| Class V | 17 (47.22) | 17 (47.22) | 02 (05.56) | | | |
| **Age of women at delivery** | | | | | | |
| 16-20 | 97 (48.02) | 59 (29.21) | 46 (22.77) | 0.1096 | -- | -- |
| 21-25 | 167 (45.63) | 135 (36.88) | 64 (17.49) | | | |
| 26-30 | 39 (34.51) | 48 (42.48) | 26 (23.01) | | | |
| >30 | 10 (50.00) | 09 (45.00) | 01 (05.00) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Religion** | | | | | | |
| Hindu | 230 (45.82) | 180 (35.86) | 92 (18.33) | 0.066 | -- | -- |
| Muslim | 57 (49.56) | 36 (31.30) | 22 (19.13) | | | |
| Buddhist & others | 26 (30.95) | 35 (41.67) | 23 (27.38) | | | |
| **Educational status of women** | | | | | | |
| Illiterate | 44 (33.59) | 43 (32.82) | 44 (33.59) | < 0.00001 | 0.001 | 3.96 (2.53-6.18) |
| Primary school | 35 (28.92) | 41 (33.88) | 45 (37.19) | | | |
| Middle school | 144 (47.21) | 123 (40.33) | 38 (12.46) | | | |
| High-school/ Graduate | 90 (62.5) | 44 (30.56) | 10 (6.94) | | | |
| **Occupation of women** | | | | | | |
| Housewife | 145 (50.17) | 111 (38.41) | 33 (11.42) | < 0.00001 | 0.806 | -- |
| Unskilled/ Semiskilled | 50 (27.47) | 80 (43.96) | 52 (28.57) | | | |
| Skilled/shop/farm | 47 (37.6) | 33 (26.4) | 45 (36) | | | |
| Professional | 71 (67.62) | 27 (25.71) | 7 (6.67) | | | |
| **Type of Family** | | | | | | |
| Nuclear | 118 (39.07) | 107 (35.43) | 77 (25.50) | 0.0016 | 0.307 | -- |
| Three Generation | 98 (44.75) | 82 (37.44) | 39 (17.81) | | | |
| Joint | 97 (53.89) | 62 (34.44) | 21 (11.67) | | | |
| **Educational status of Husband** | | | | | | |
| Illiterate | 21 (27.27) | 31 (40.26) | 25 (32.47) | < 0.00001 | 0.031 | 0.74 (0.46-1.21) |
| Primary school | 23 (24.73) | 45 (48.39) | 25 (26.88) | | | |
| Middle school | 101 (40.08) | 99 (39.28) | 52 (20.63) | | | |
| High school | 86 (55.84) | 44 (28.57) | 24 (15.58) | | | |
| Diploma/ Graduate/PG | 82 (65.6) | 32 (25.6) | 11 (8.8) | | | |
| **Occupation of Husband** | | | | | | |
| Unemployed | 03 (30.00) | 05 (50.00) | 02 (20.00) | < 0.00001 | 0.001 | 2.76 (1.73-4.38) |
| Unskilled work | 50 (26.31) | 86 (45.26) | 54 (28.42) | | | |
| Semiskilled work | 58 (36.02) | 56 (34.78) | 47 (29.19) | | | |
| Skilled work | 61 (46.92) | 48 (36.92) | 21 (16.15) | | | |
| Shop/farm/ others | 141 (67.14) | 56 (26.67) | 13 (6.19) | | | |
| **Birth Order** | | | | | | |
| 1 | 162 (52.77) | 97 (31.60) | 48 (15.63) | 0.0012 | 0.051 | -- |
| 2 | 104 (41.60) | 92 (36.80) | 54 (21.60) | | | |
| ≥3 | 47 (32.64) | 62 (43.05) | 35 (24.31) | | | |
| **Age of Marriage of women** | | | | | | |
| <18 | 57 (42.22) | 39 (28.89) | 39 (28.89) | 0.0048 | 0.467 | -- |
| 18-20 | 239 (45.78) | 188 (36.01) | 95 (18.20) | | | |
| >20 | 17 (38.64) | 24 (54.54) | 03 (06.82) | | | |
| **Distance of hospital** | | | | | | |
| <1 km | 73 (43.97) | 72 (43.37) | 21 (12.65) | 0.0007 | 0.307 | -- |
| 1–3 km | 106 (38.83) | 96 (35.16) | 71 (26.01) | | | |
| >3 km | 134 (51.14) | 83 (31.68) | 45 (17.17) | | | |

(Figures in the parenthesis indicate percentages)

**Table 3: Reasons for preference for the place of delivery.**

| Reasons for home delivery | | Reasons for Govt. hospital delivery | | Reasons for private hospital delivery | |
|---|---|---|---|---|---|
| **Reasons** | **Number (%)** | **Reasons** | **Number (%)** | **Reasons** | **Number (%)** |
| **Hospital delivery not affordable economically** | 54 (39.42) | Promoted by family member | 111 (44.22) | Good facilities | 291 (92.97) |
| **Not needed (as no complications in previous delivery)** | 61 (44.52) | Promoted by health worker | 79 (31.47) | Promoted by family member | 222 (70.93) |

| | | | | | |
|---|---|---|---|---|---|
| **No transport facility** | 45 (32.85) | Transport facility available | 51 (20.31) | Transport facility available | 196 (62.62) |
| **Time constraint (labor too quick to reach hospital)** | 66 (48.17) | Nearer | 156 (62.15) | Nearer | 112 (35.78) |
| **Hospital far apart** | 30 (21.90) | Economically affordable | 201 (80.08) | Private facility affordable economically | 142 (45.37) |
| **Night time** | 15 (10.95) | Good facilities | 82 (32.25) | Negligence from government staff | 159 (50.80) |
| **Negligence from hospital staff in previous delivery** | 19 (13.87) | Private facility not affordable economically | 122 (48.60) | No facilities at government hospital | 101 (32.27) |
| **No road facility** | 09 (06.57) | | | Other | 59 (18.85) |
| **Other** | 13 (09.49) | | | | |

(Figures in the parenthesis indicate percentages)

## DISCUSSION

The present study has been carried out to study the association of place of delivery with various socio-demographic factors among rural women and the reasons for their home or institutional deliveries.

It was observed that 313 (44.65%), 251 (35.80%) & 137 (19.54%) were private institutional, government institutional and home deliveries respectively. Our study findings were consistent other studies by Ansari et al and others.[10–12] Other studies from Maharashtra like that by Thind et al and Khatib et al found proportion of home deliveries higher than that of our study.[13,14] These inconsistencies may be attributed to different socio-demographic study settings in these studies. The study performed by Mumbare et al also found more percentage of home delivery as the study was performed in tribal population.[15]

Inverse and statistically significant relationship was found between home deliveries and education level of mother in our study. Studies performed in rural Maharashtra by Mumbare et al and Nakel et al showed similar results.[11,15] Studies from rural areas of other states by Anita et al and some other studies also showed findings consistent with our study.[3,16–19]

It was noted that home deliveries were significantly more frequent among women engaged in skilled (36.97%) and unskilled work (28.57%). Pandey, Nakel et al and Ravi et al also observed home deliveries to be predominantly more in women performing labour work or agricultural work.[11,19,20]

In our study, the home deliveries were observed to be significantly more in nuclear families (25.05%) than in the joint families (11.67%). Findings consistent with our study were found in a studies by Pandey et al and Nakel et al.[11,20]

We observed statistically significant inverse relationship between education of the husband and prevalence of home deliveries in our study. The studies conducted in India by Thind et al and others showed findings consistent with our study.[13,16,21,22]

The present study findings concluded that the proportion of home deliveries was more when the husbands had semiskilled (29.19%) and unskilled (28.42%) work as their occupation and this association was also statistically significant ($p<0.00001$). Similar findings were observed in studies by Idris et al and Pandey.[20,23] Studies by Dey et al and others also found results consistent with our study.[21,24,25]

In the present study, it was noted that the home deliveries increased with the increase in parity from 15.63% in birth order 1 to 24.31% in birth order ≥3. This association was found to be statistically significant in bivariate analysis ($p=0.0012$). Our study findings were consistent with studies by Thind A. et al and other.[11,13,19,26–28]

A statistically significant inverse relationship between home deliveries and the age of marriage of the women was observed in our study. Studies by Wagale R.R. et al and others observed that the proportion of home deliveries to decrease with increase maternal age of marriage as was observed in our study.[17,19,26,29]

Our study observed a statistically significant inverse relationship between government institutional deliveries and the distance of home from the health center. However, no definite trend with respect to the distance from government hospital was observed in home deliveries. Results consistent with our study were reported by Kumari et al and others.[19,30,31]

Our study observed no statistically significant association between place of delivery and factors like age of mother at delivery, religion and socio-economic status of the women. These findings were consistent with that of study performed by Pandey et al.[20]

In the multiple regression analysis of the 8 factors, only 3 factors were found to be independently significant, namely, Education of women, Occupation of husband and education of husband. The Adjusted Odds Ratio (AOR) of these variables revealed that Educational status of women is the strongest predictor of place of delivery (AOR=3.96), followed by Occupation of husband (AOR=2.76). Similar findings were observed by Nakel et al in their study.[11] Sahoo et al in their study found Education of women (AOR=1.438) and occupation of the spouse (AOR=1.102) to be significant in MLR, which was consistent with our study.[21] Results of study by Das et al and Sharma et al were inconsistent with our study findings.[24,26] The reason for these differences might be due to differences in the study settings.

When we questioned the study participants about the reasons for preference of home delivery, multiple responses were given by most of them. The most frequently given answer was 'time constrain' (48.17%), followed by 'not needed (as no complications in previous delivery)' (44.52%) and 'hospital delivery not affordable' (39.42%). These reasons highlight the lack of adequate knowledge about importance of institutional deliveries and about the availability of JSY and JSSK facilities at government institutes.

The most commonly given reasons by mothers for government hospital delivery were that the government facility was 'affordable' (80.08%), 'near to residence' (62.15%) and 'private facility not available' (48.60%). From this it was evident that the main reasons for preferring government hospital for delivery was its affordability and accessibility.

The most frequently given reasons for private hospital delivery were 'good facilities' (92.97%), followed by 'promoted by family member' (70.93%) and 'transport facility available' (62.62%). Thus most of the reasons for preference of private health facility for delivery were the perceived quality of good care at these facilities.

Findings consistent with our results were observed by Tuladhar and Ansari et al.[10,32] Studies performed by Kotnis et al and others observed results differing from our study.[20,26,33,34] All these studies gave custom, traditions and taboos as one of the common reasons encountered for non-institutional deliveries. This difference observed could be due to the fact that our study did not include any tribal, migratory or nomadic population which was the case in these studies.

## CONCLUSION

The proportion of home deliveries in 2001-15 was 13.08% as against 35.80% of government institutional deliveries and 44.65% of private institutional deliveries. Education of women, Occupation & Education of husband have emerged as significant independent risk factors for the home delivery in multivariate analysis.

Education of the women was found to be the strongest predictor of place of delivery in our study. Inverse relationship was observed between education of the women and proportion of home deliveries. Thus improving the overall educational level of the women will definitely improve the scenario. Occupation of the husband was also seen to be strongly associated with place of delivery as it is mostly linked with the economic paying capacity of the family. Education of the husband was also seen as a significant predictor of place of delivery. But the strength of association was found to be weaker than other factors.

Lack of awareness about need and importance of institutional deliveries was an important reason for home deliveries. The women, who prefer the government institutes for delivery, do so mostly due to the easy accessibility and economic affordability of those institutes, whereas private institutes were preferred because of the perceived good quality of care at these hospitals.

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