

Original Research Article

Utilization of antenatal care services in tribal area of Madhya Pradesh: a community based cross sectional study

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ABSTRACT

Background: As part of the Sustainable Development Goal 3, the target is to reduce the global maternal mortality ratio to less than 70 per 100 000 live births globally by 2030. Antenatal care (ANC) is an important determinant of maternal mortality and ANC visit is an important component of maternal health care. This study was carried out to assess the utilization of antenatal care services and to understand the factors associated with utilization of antenatal care services in tribal area of Madhya Pradesh.

Methods: Community based cross-sectional study carried in tribal dominated district of Madhya Pradesh. A total of 210 mothers who delivered in last one year were selected for study by cluster sampling technique and mothers were interviewed using structured questionnaire after obtaining informed consent.

Results: Present study 94.8% antenatal mothers registered and received at least one antenatal check-up and 51.4% mother were registered during first trimester while only 43.4% mothers received four or more ANC visits. Completely utilization of ANC services was found in 39.5% mother. Education of the mother, occupation of mother, income, education of the husband, knowledge of mother about the needs of antenatal care and early ANC registration were found to be significant factors associated with full utilization of ANC services.

Conclusions: This study revealed that education of mother and knowledge of mother about the needs of ANC were important contributing factors associated with full utilization of ANC services in tribal area. The education is related with the economic status, awareness of mother about utilization health services, empowerment and decisions making capacity of mothers.

Keywords: Ante natal care, Early registration, Tribal, Utilization of antenatal care, Iron folic acid, Tetanus toxoid

INTRODUCTION

About 830 women die from pregnancy or childbirth related complications around the world every day.¹ The global maternal mortality ratio fell from 385 deaths per 100 000 live births in 1990, to 216 in 2015, corresponding to a relative decline of 43.9%. It was estimated that in 2015, roughly 303 000 women died during and following pregnancy and childbirth. Almost

all of these deaths occurred in low-resource settings, and most could have been prevented.² As part of the Sustainable Development Goal, the target is to reduce the global maternal mortality ratio to less than 70 per 100 000 live births globally by 2030, with no individual country having a maternal mortality ratio of more than 140 maternal deaths per 100 000 live births.³ Antenatal care (ANC) is an important contributing factor of maternal mortality and ANC visit is an important

component of maternal health care on which the health of mothers and new-borns depend.⁴

According to WHO, every pregnant woman should receive at least four ANC visit to the health institution during pregnancy.⁵ The antenatal visit during antenatal period provide an important opportunity for recognising threats to the mother and unborn baby's health, as well as for counselling of mothers on nutrition, birth preparedness, delivery care and family planning options after the birth.⁵⁻⁷ According to 2015-16, National Family Health Survey (NFHS-4), only 31.1% of pregnant females received full antenatal care in India.⁸ Utilization of antenatal care can be affected by large number of factors including socio-demographic factors and economic factors such as age of the woman, education, work status, parity, income, accessibility and availability of maternal and child health services etc.⁹⁻¹² Therefore, present study was conducted with the objectives to assess the utilization of antenatal care services and to understand the factors associated with utilization of antenatal care services in tribal area of Madhya Pradesh.

METHODS

This community-based cross-sectional study was carried out in the Nainpur block of Mandla district of Madhya Pradesh. Mandla is a tribal dominated district of east-central part of Madhya Pradesh. The study was carried out from 1st October, 2012 to 30th September, 2013 and study subject was 210 mothers of selected clusters, who had delivered within last one year, who was a resident of the study area. Multi-indicator cluster survey (MICS) was done with 30 clusters sampling method, proposed by the WHO, which is a standard method for rapid assessment of coverage evaluation.¹³

Sample size was calculated by using the formula $n = Z^2 pq/d^2$ (where $Z=1.96$ at 95% confidence; $p=ANC$ utilization; $q=1-p$; $d=$ absolute allowable error. For this study we presumed maximum variability. Taking design effect of two, the required sample size was 192. For a 30 cluster technique, number of subjects to be selected per cluster $192/30=6.4$. So we have to select 30 clusters, each with 7 mothers making a total sample size of $30 \times 7=210$.

The list of villages in the Community Development Block with their population was obtained from the tehsil office of Nainpur Block. This study was carried out with the help of Aganwadi workers of ICDS project. The 30 clusters were selected on the basis of systematic random sampling from the probability of the cluster selection based on the population size of the cluster. In each cluster, first house was selected at central point in the cluster/village by tip of pen method, choose direction from that point, count the number of households between the central point and the edge of village in that direction, and select one of these houses at random to be the starting point. Then data collection was done with the help of Aganwadi workers on house to house basis till the

desired sample size was achieved. House to house data collection was continued till 7 mothers who delivered in last one year. If all 7 mothers who delivered within last one year were not found in that cluster/village the remaining mothers to be covered from next cluster/village.

A pretested structured questionnaire was used for interview mothers who delivered within last one year used to collect required information. Before starting study approval was obtained from the Institutional Ethics Committee and data were collected after obtaining informed consent from mother. The questionnaire consisted of two parts. First part recorded the socio demographic information including age of mother; education of mother, occupation of mother, type of family, family size, cast, family income, education of husband and occupation of husband. Second part of questionnaire was information about utilization of ANC services and reasons of non-utilization of services. The mother who had answered in the negative for utilization of ANC services was asked for their view on non-utilization. Full utilization of ANC services was considered, if the mother received at least four antenatal check-up visits to the health facility including early registration (ANC registration within 12 weeks/ first trimester of pregnancy), two doses/booster doses of tetanus toxoid (TT) injection and consumption of 100 or more iron folic acid (IFA) tablets during pregnancy.

Data collected was entered into MS Excel and then analysed using Statistical Package for Social Sciences (SPSS, version 20) software. Percentages, means, standard deviation (SD), chi-square (χ^2) tests and odds ratio (OR) were calculated with applying logistic regression model and $p<0.05$ was considered statistically significant.

RESULTS

A total of 210 mothers, who delivered in last one year were interviewed in the study. Out of 210 mothers, 76.7% mothers were belonged to 15-24 years of age with mean age of mothers was 23.46 ± 3.80 years. Majority of (87.1%) of the mothers had husbands involved in agriculture work or labour class, 40.5% of the mothers were illiterate and 56.7% of the mothers were house wives. The other socio demographic characteristics of antenatal mothers are shown in Table 1.

As shown in Table 2, in this study out of 210 mothers, who delivered in last one year, 199 (94.8%) antenatal mothers registered and received at least one antenatal check-up and 108 (51.4%) mother were registered during first trimester (early Registration) while only 91 (43.4%) mothers received four or more ANC visits recommended as per guidelines. Majority of (80.5%) mother received two doses/booster doses of tetanus toxoid (TT) injections. Most of (86.7%) mother received recommended number of 100 or more iron folic acid (IFA) tablets, but only

62.9% of the mother consumed all received ≥ 100 IFA tablets. In this study full utilization of ANC services (registered at their first trimester, four or more antenatal

visits with at least two doses/booster doses of tetanus toxoid (TT) injections and consumed 100 or more IFA tablets) was found in 83 (39.5%) mother.

Table 1: Socio demographic characteristics of mothers (n=210).

| Socio demographic profiles | Frequency | Percentage (%) | |
|----------------------------|-----------------------|----------------|------|
| Age of mothers (in years) | 15-24 | 161 | 76.7 |
| | 25-34 | 49 | 23.3 |
| Education of mother | Illiterate | 85 | 40.5 |
| | Up to primary level | 77 | 36.7 |
| | Up to middle level | 27 | 12.9 |
| | High school and above | 21 | 10.0 |
| Occupation of mother | House wife | 119 | 56.7 |
| | Labour/Agriculture | 70 | 33.3 |
| | Service | 14 | 6.7 |
| | Business | 7 | 3.3 |
| Type of family | Joint | 121 | 57.6 |
| | Nuclear | 89 | 42.4 |
| Family size | 3 | 23 | 11.0 |
| | 4-6 | 94 | 44.8 |
| | 7-10 | 71 | 33.8 |
| | >10 | 22 | 10.5 |
| Cast | General/Other | 73 | 34.8 |
| | SC | 12 | 5.7 |
| | ST | 125 | 59.5 |
| Income | >10,000 | 48 | 22.9 |
| | 10,000-5000 | 110 | 52.4 |
| | < 5000 | 52 | 24.8 |
| Education of husband | Illiterate | 39 | 18.6 |
| | Up to primary level | 57 | 27.1 |
| | Up to middle level | 68 | 32.4 |
| | High school and above | 46 | 21.9 |
| Occupation of husband | Labour/Agriculture | 183 | 87.1 |
| | Service | 15 | 7.1 |
| | Business | 12 | 5.7 |

Table 2: Pattern of utilisation of ANC services by the mothers during pregnancy (n=210).

| Antenatal care services | No of mothers | Percentage (%) |
|--|---------------|----------------|
| Antenatal mother registered and received at least one Antenatal check up | 199 | 94.8 |
| Early registration | 108 | 51.4 |
| Received at least four antenatal visits | 91 | 43.4 |
| Received 2 doses/booster TT injections | 169 | 80.5 |
| Received ≥ 100 iron folic acid tablets | 182 | 86.7 |
| Consumed all received ≥ 100 iron folic acid tablets | 132 | 62.9 |
| Fully utilized ANC | 83 | 39.5 |

Education of the mother, occupation of mother, cast, income, education of the husband, knowledge of mother know about the needs of antenatal care, early ANC registration during first trimester were found to be significant factors associated with utilization of ANC services (Table 3). It was observed that, education of mothers ($p=0.006$) and occupation of mother ($p=0.47$) was an important contributing factors for utilization of

ANC. Educated women were 2.272 times (95% CI: 1.261-4.093) more likely to receive ANC service than those who had no schooling, and women who were house wife were 1.776 times (95% CI: 1.005-3.140) more likely to receive ANC service than those who were agriculture /labour/service/business. Mothers who belonged to general, SC and other cast utilized ANC service 2.176 times more (95%CI: 1.233-3.837) then ST ($p=0.007$).

Similarly women whose husband were educated were 5.703 times (95%CI: 2.128-15.285) more likely to use the service than those who had no schooling. The study also showed that husbands education was important (p=0.000) significant relationship with utilization of ANC services by their wife. The mother who knew about the need of ANC services during antenatal period, utilized ANC

services 2.372 times more (95%CI: 1.310-4.295) than who did not knew and it was significant (p=0.004). Mother who were registered during first trimester (early registration) 2.991 times (95% CI: 1.676-5.341) more likely to utilized ANC service than those who registered late in antenatal period and significant factor (p=0.000) for utilization of ANC services.

Table 3: Factors affecting antenatal care (ANC) services utilization.

| Variables | Antenatal care service | | Chi-square (χ^2) | OR | 95% CI | P value | |
|-----------------------------|---------------------------------------|-------------------------------------|-------------------------|--------|--------|--------------|-------|
| | Full utilization (n=83) | Inadequate/ Non utilization (n=127) | | | | | |
| Age of mothers (years) | < 25 | 68 (42.2) | 93 (57.8) | 2.124 | 1.657 | 0.837-3.282 | 0.145 |
| | ≥ 25 | 15 (30.6) | 34 (69.4) | | | | |
| Education of mother | Some schooling | 59 (47.2) | 66 (52.8) | 7.613 | 2.272 | 1.261-4.093 | 0.006 |
| | No schooling | 24 (28.2) | 61 (71.8) | | | | |
| Occupation of mother | House wife | 54 (45.4) | 65 (54.6) | 3.938 | 1.776 | 1.005-3.140 | 0.047 |
| | Agriculture/labour/ service/ business | 29 (31.9) | 62 (68.1) | | | | |
| Types of family | Joint | 45 (37.2) | 76 (62.8) | 0.651 | 0.795 | 0.454-1.390 | 0.420 |
| | Nuclear | 38 (42.7) | 51 (57.3) | | | | |
| Family size | Large | 73 (39.0) | 114 (61.0) | 0.169 | 0.832 | 0.347-1.997 | 0.681 |
| | Small | 10 (43.5) | 13 (56.5) | | | | |
| Cast | General/SC/other | 43 (50.6) | 42 (49.4) | 7.314 | 2.176 | 1.233-3.837 | 0.007 |
| | ST | 40 (32.0) | 85 (68.0) | | | | |
| Income | < 5000 | 29 (55.8) | 23 (44.2) | 7.631 | 2.428 | 1.282-4.598 | 0.006 |
| | ≥ 5000 | 54 (34.2) | 104 (65.8) | | | | |
| Education of husband | Some schooling | 78 (45.6) | 93 (54.4) | 14.288 | 5.703 | 2.128-15.285 | 0.000 |
| | No schooling | 5 (12.8) | 34 (87.2) | | | | |
| Occupation of husband | Agriculture/Labour | 69 (37.7) | 114 (62.3) | 1.970 | 0.562 | 0.250-1.266 | 0.160 |
| | Service/business | 14 (51.9) | 13 (48.1) | | | | |
| Live birth | Two or more | 55 (41.7) | 77 (58.3) | 0.683 | 1.276 | 0.716-2.273 | 0.409 |
| | One | 28 (35.9) | 50 (64.1) | | | | |
| Mother know the need of ANC | Yes | 36 (53.7) | 31 (46.3) | 8.309 | 2.372 | 1.310-4.295 | 0.004 |
| | No | 47 (32.9) | 96 (67.1) | | | | |
| Early ANC registration | Yes | 56 (51.9) | 52 (48.1) | 14.138 | 2.991 | 1.676-5.341 | 0.000 |
| | No | 27 (26.5) | 75 (73.5) | | | | |

Table 4: Reason for inadequate/ non utilization of ANC services (n=127).

| Reason | Number | Percentage (%) |
|--|--------|----------------|
| Unaware about ANC services | 59 | 46.4 |
| Due to high cost | 34 | 26.7 |
| Free service was too far | 13 | 10.3 |
| Provider was not there or provider asked to come back other time | 9 | 7.1 |
| Tradition | 7 | 5.6 |
| Other | 5 | 3.9 |

No significant association of utilization of ANC services was found with age of mother, type of family, family size, occupation of husband and number of live birth.

Main reasons for inadequate utilization of ANC services were unawareness about ANC services, high cost of services, availability of free service was too far, provider

was not there or provider asked to come back other time, etc. (Table 4).

DISCUSSION

This study carried out of 210 mothers with the objectives is to assess the utilization of antenatal care services and to understand the factors associated with utilization of

antenatal care services in the tribal district of Madhya Pradesh.

In the present study early registration within 12 week of their pregnancy was found in 51.4% mothers. The findings were similar to study of Parineeta et al, 50.9%, Roy et al, 53.7%, Gundbowdi et al, 53.8% and Mumbare et al, 63.81% mothers were registered within 12 weeks of pregnancy.¹⁴⁻¹⁷ However, study conducted by Birmeta et al, at Ethiopia, and Zhao et al., at Shanghai, early registration within 12 week of was only 42% and 19.7% respectively which is less than present study.^{18,19} NFHS-4 shows slightly higher percentage of mothers registered in first trimester which was 58.6% and 53.1% according to national, Madhya Pradesh respectively.⁸

Present study showed that 43.4% mothers received four or more antenatal visits which were less than NFHS-4 national, shows that 51.2% but more than NFHS-4 MP state, and shows that 35.7% pregnant women had at least 4 antenatal visit.⁸ Previous studies record three or more antenatal visits as adequate visits. Findings of present study were quite less than that of Roy et al, Joshi et al, Panja et al, and Haridas et al who found it 85.5%, 90%, 91% and 67.75% respectively, but higher than that reported by Singh et al, who found that 37.1%, pregnant women had three or more antenatal check-ups.^{15,20-23}

In present study, it was seen that 86.7% women received recommended number of 100 or more iron folic acid (IFA) tablets, but only 62.9% of the women consumed all received ≥ 100 IFA tablets which is comparable to study conducted at Karnataka, and Kakati, where 65.6% and 48.4% mothers consumed at least 100 IFA tablets respectively.^{24,25} Moreover NFHS-4, national fact sheet, Madhya Pradesh fact sheet revealed that only 30.3% and 23.6% mothers respectively consumed iron folic acid for 100 days or more when they were pregnant.⁸

In this study 80.5% mothers received two doses/booster doses of tetanus toxoid (TT) injections and were protected against neonatal tetanus this corresponds with NFHS-4 national fact sheet, Madhya Pradesh fact sheet which reported 89.0% and 89.8% of mothers respectively whose last birth was protected against neonatal tetanus.⁸ Findings of present study are also comparable with that of Parineeta et al, Mumbare et al, Haridas et al, and Singh et al.^{14,17,22,26}

In this study full utilization of ANC services was found in 39.5% mothers. NFHS-4 national fact sheet and Madhya Pradesh fact sheet was reported full utilization of ANC services 21.0% and 11.4% respectively which is less than reported in our study.⁸ Study conducted by Singh et al,²³ and Rahman et al, who observed that 24.7% and 19% pregnant females received full antenatal care.^{23,27} According to Banerjee, 86%, Javali, 62.6% and Singh et al, 52.5% mother received full ANC services in their study which is higher than that seen in present study.^{24,28,29} The difference in utilization of ANC services

may be due to variation in awareness health in mothers, availability of health services and health care seeking behaviour of pregnant women.

In this study, education of the mother ($p=0.006$) and knowledge of mother know about the needs of antenatal care ($p=0.004$) were found to be significantly associated with utilization of full ANC services. Study conducted by Jat et al reported that higher education levels of mother's were significant factor for the use of maternal health services.³⁰ Other studies also reported the positive relationship between level of maternal education and use of maternal health care services; the better educated women are, more aware about their own health, know more about accessibility of maternal health care services and use this awareness and information in accessing the health care services.^{12,29,31} Knowledge of mother know about the needs of antenatal care were found to be significantly associated with utilization of ANC services which was consistence with the report from India, Ethiopia, Japan and Indonesia.³²⁻³⁴

In our study literacy of husbands was significantly ($p=0.000$) related with utilization of full ANC services by their wife which is consistence with the reports of other studies carried out in India and abroad.^{17,32,33} So husband education might be playing a significant role in supporting the antenatal mother to access the antenatal and other health services. Higher use of ANC service by educated groups could be due to the impact of education on awareness, better the understanding of information and better the knowledge about importance of the services.

In this study, housewife antenatal mothers significantly ($p=0.047$) utilized full antenatal care compared to working women. Similar finding were reported in other studies.^{35,36} The poor utilization of antenatal care by working women might be due to the fact that they couldn't afford to lose their wages.

In this study, income was found to be ($p=0.006$) significantly associated with utilization of full ANC services. Jat et al have reported socioeconomic status and mother's education as the factors associated with the use of ANC services.³⁰ Previous other studies also reported that economic status is an important determinant of ANC utilization by mothers.^{15,17,24,32,37}

In this study early ANC Registration during first trimester were found to be ($p=0.000$) significant factors associated with full utilization of ANC services than those who registered late in antenatal period. This was consistent with finding of studies conducted by Roy et al and Kushwaha et al.^{15,38} Encouraging early registration will ensure better maternal health in a long run.

However, this study revealed that variables like age of mother, type of family, family size, live birth and occupation of husband were not significantly associated

with the full utilization of the ANC services in the tribal area of MP.

CONCLUSION

This study revealed that that early ANC registration during first trimester and knowledge of mother about the needs of antenatal care were found to be significant factors associated with full utilization of ANC services by pregnant mothers. Therefore counselling of mother about early registration during first trimester, importance of full ANC services at individual level and also at community level by public awareness and behavioural change communication will support to encourage to full ANC service utilization. Present study revealed, that education of the mother, education of the husband, occupation of mother, income, were found to be significant factors associated with full utilization of ANC services. Female education is related with the economic status of mothers, awareness of mother about utilization health services, empowerment of mothers and independent decisions making capacity of mothers. Therefore, in the present study, it was concluded that the role of education, especially of female education in tribal area, is important contributing factor associated with utilization of ANC services.

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