

## Original Research Article

# Utilization of antenatal health care services and its impact on birth weight of newborn in rural area of Western Rajasthan, India

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## ABSTRACT

**Background:** Antenatal care is an important component of reproductive and child health but has not been utilized to the full extent in India. The study is aimed to assess the utilization of antenatal health care services by mothers and its impact on birth weight of their newborn.

**Methods:** A community based cross sectional study was conducted in a rural area of Jodhpur, Rajasthan. A total of 198 women of study area who have delivered between 1st July 2013 to 30th June 2014 (12 months period) were interviewed by pre-designed and semi-structured questionnaire by door to door approach.

**Results:** Present study showed that 100% of mothers registered their pregnancy in any health facility and 56.6% were registered in 2nd trimester. Only 32.8% mothers had received four or more antenatal visits. Only 26.26% mothers had utilized full antenatal care (minimum four antenatal visits, minimum one TT and minimum 100 IFA tablet taken) during pregnancy. The prevalence of low birth weight was 12.6%. Proportion of LBW babies was more (15.9%) in mothers who had not availed of full antenatal care. This difference was statistically significantly ( $P < 0.05$ ).

**Conclusions:** The important factors related to low utilization of Antenatal services were lower socioeconomic status, lower literacy of mothers, working mothers, parity and nuclear family. The findings of this study may be utilized by the health managers and health care providers to address the problem of low ANC coverage.

**Keywords:** Antenatal care, Full utilization, Low birth weight, Rural area

## INTRODUCTION

Motherhood is the basis of family life. Promoting women's health improves not only individual health but also the health of the family, community and the nation.<sup>1</sup>

Antenatal care (ANC) is a pivotal factor for safe motherhood. The primary aim of ANC is to achieve healthy mother and a healthy baby at the end of a

pregnancy. Mothers who had not received good quality ANC were found to be more at risk of having low birth weight babies.<sup>2,3</sup>

The World Health Organization (WHO) recommends a minimum of four antenatal visits, comprising interventions such as tetanus toxoid (TT) vaccination, screening and treatment for infections, and identification of warning signs during pregnancy. Only 64% of

pregnant women received the recommended minimum of four antenatal care visits or more, suggesting that large expansions in antenatal care coverage are still needed.<sup>4</sup>

The focus on maternal mortality was sharpened when reduction in maternal mortality included in development goals. Now the target for Sustainable Development Goals 3 was reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030.<sup>5</sup>

India has the dubious distinction of having the highest estimated number of maternal deaths (136000) in any country.<sup>6</sup> Maternal mortality is 167 and 244 per 100,000 live birth in India and Rajasthan respectively according to SRS 2013.<sup>7</sup> In addition to the number of deaths each year, over 50 million women suffer from maternal morbidity due to acute complications from pregnancy.<sup>8</sup> They seek to provide universal access to equitable, affordable and quality maternal health care, as well as to bring about an improvement in the health status of the pregnant women belonging to underprivileged sections of the society. In this perspective, the present study aimed to assess the utilization of antenatal care services by mothers and its impact on birth weight of newborn in rural area of western Rajasthan.

#### Aims and objectives

- To assess the utilization of Antenatal health care services by mothers and its impact on birth weight of their newborn.
- To know the factors influencing the utilization of Antenatal services.

#### METHODS

This community based cross sectional study was conducted at the Banar gram panchayat, a rural field practice area of Department of Community Medicine, Dr. S. N. Medical College, Jodhpur, Rajasthan. Banar gram panchayat covered five villages with a population of 8615<sup>[9]</sup>. The subjects for present study were married women which were residing in study area since one year and delivered during the time period of 1<sup>st</sup> July 2013 to 30<sup>th</sup> June 2014. A list of women, which were fulfilling above criteria, was prepared and obtained data by house to houses approach of subjects. In Study area (Population-8615), 198 married women delivered during 1<sup>st</sup> July 2013 to 30<sup>th</sup> June 2014.<sup>9</sup> All these women were included in the study. Tool of study was a pre-designed, pre-tested and semi-structured questionnaire. Data was entered in Microsoft excel version 2010 and analyzed by SPSS version 21. Chi square test and fisher exact test were applied to find statistical significance.

#### Ethical approval & consent

The subjects were assured before interview that information obtained from them will be kept confidential. There approval was sought before collection of data. The

study was approved by the Institutional Ethics Committee.

#### RESULTS

A total of 198 women had delivered during 1<sup>st</sup> July 2013 to 30<sup>th</sup> June 2014. All of these were included in the study. Out of 198 mothers, 64.14% of mothers were belonged to 15-24 years of age group with mean age of 23.70±3.17 years. 50.50% of mothers were illiterate. The other characteristics of mothers are shown in Table 1.

**Table 1: Socio-demographic characteristics of mothers (N=198).**

Particular		Number of mothers	%
Age group (In Years)	15-24	127	64.14
	25-34	69	34.85
	≥35	2	1.01
Occupation	Housewife	177	89.39
	Working	21	10.61
Religion	Hindu	180	90.91
	Muslim	18	9.09
	Others	0	0
Type of family	Joint	143	72.23
	Nuclear	55	27.78
Literacy Status	Illiterate	100	30.50
	Primary	23	11.62
	Middle	40	20.20
	Secondary & Higher	25	12.63
	Secondary		
	College	10	5.05
Socio-economic status	Class I	6	3.03
	Class II	85	42.93
	Class III	78	39.39
	Class IV	29	14.65
	Class V	0	0
Parity	I	71	35.86
	II	58	29.29
	III	35	17.68
	≥ IV	34	17.17
Place of delivery	Institution	175	88.38
	Home	23	11.62

Out of 198 mothers, only 75 (37.88%) mothers were registered their pregnancy in first trimester and 32.83% of mothers received 4 or more antenatal visit. The main reason behind not receiving 4 or more antenatal visit was that 72.93% of mothers say that it was not necessary. In present study, almost all (97.98%) mothers immunized with adequate dose of tetanus toxoid and only 37.37% of mothers taking 100 or more than 100 IFA tablets. The main reason of not receiving 100 or more IFA tablets was that side effect/ bad taste of tablets (Table 2).

In present study, only 26.26% of mothers had utilized full antenatal care (minimum four antenatal visits, minimum

one TT and minimum 100 IFA tablet taken) during pregnancy (Table 3).

**Table 2: Distribution of mothers according to different antenatal variable.**

Antenatal variable	Number of mothers	Percentage of mothers
Time of Antenatal registration (N=198)	1 <sup>st</sup> Trimester	75
	2 <sup>nd</sup> Trimester	112
	3 <sup>rd</sup> Trimester	11
Number of Antenatal visit (N=198)	1	14
	2	64
	3	55
	≥4	65
Reason for not receiving 4 or more antenatal visit (N=133)	Lack of knowledge	26
	Not accessible	7
	Fear of hospital	3
	Objection of family members	0
	Not necessary	97
Number of injection TT (N=198)	Nil	4
	1 or only booster	47
	2	147
Number of taking IFA Tablets (N=198)	< 100	124
	≥ 100	74
Reason of not taking 100 or more IFA Tablets (N=124)	Received less tablets	51
	Side effect/ Bad taste	59
	Objection of family members	2
	Fear of hospital	3
	Other (not necessary)	9
		7.26

**Table 3: Distribution of mothers according to utilization of antenatal care services (N=198).**

Antenatal care	Number of mothers	Percentage of mothers
Full utilization	52	26.26
Non/ Partial utilization	146	73.74
Total	198	100

The present study revealed that prevalence of low birth weight was 12.6%. Proportion of LBW babies was more

(15.9%) in mothers who had not availed of full antenatal care in comparison by mothers who had utilized full antenatal care (4.1%) and this difference was statistically significant ( $P < 0.05$ ) (Table 4).

In present study, proportion of full utilization of antenatal care decreased with decreasing in socioeconomic status and literacy level of mothers, working mothers, increased parity and nuclear type of family. Out of which only literacy of mother and type of family were significantly associated with utilization of antenatal care services. No significant association was found with socioeconomic status, parity and occupation of mothers (Table 5).

**Table 4: Association of utilization of antenatal care with birth weight of the child (N=175).**

Antenatal care	Birth Weight		Total	
	Normal	LBW		
Full utilization	47 (95.9%)	2 (4.1%)	49 (100%)	$\chi^2 = 4.463$ , $P = 0.035$ , $df = 1$
Non/ Partial utilization	106 (84.1%)	20 (15.9%)	126 (100%)	
Total	153 (87.4%)	22 (12.6%)	175 (100%)	

**Table 5: Association of different socio-demographic factors of mothers with utilization of antenatal services.**

Socio-demographic factor		Full utilization	Partial/ Non utilization	Total	
Literacy of mother	Illiterate	18 (18%)	82 (82%)	100 (100%)	$\chi^2=17.578$ , df=4, P=0.001
	Primary	4 (17.4%)	19 (82.6%)	23 (100%)	
	Middle	13 (32.5%)	27 (67.5%)	40 (100%)	
	Sec. & High Sec.	10 (40%)	15 (60%)	25 (100%)	
	College	7 (70%)	3 (30%)	10 (100%)	
Socio-economic status of family	I	3 (50%)	3 (50%)	6 (100%)	Fisher exact = 3.136, P = 0.350, df = 3,
	II	22 (25.9%)	63 (74.1%)	85 (100%)	
	III	22 (28.2%)	56 (71.8%)	78 (100%)	
	IV	5 (17.2%)	24 (82.8%)	29 (100%)	
Occupation of mothers	Housewife	50 (28.2%)	127 (71.8%)	177 (100%)	$\chi^2=3.39$ , df=1, P=0.06
	Working	2 (9.5%)	19 (90.5%)	21 (100%)	
Type of family	Joint	45 (31.5%)	98 (68.5%)	143 (100%)	$\chi^2= 7.205$ , df=1, P=0.007
	Nuclear	7 (12.8%)	48 (87.2%)	55 (100%)	
Parity of mothers	1	23 (32.4%)	48 (67.6%)	71 (100%)	$\chi^2=4.86$ , df=3, P=0.18
	2	16 (27.6%)	42 (72.4%)	58 (100%)	
	3	9 (25%)	27 (75%)	36 (100%)	
	≥ 4	4 (12.1%)	29 (87.9%)	33 (100%)	

## DISCUSSION

For building a sound and healthy nation, protecting the health of expectant mother and her children is of prime importance. In this aspect, care of mother and child occupies a paramount place in health services delivery system. This could be achieved only by taking preventive measures to combat future complication through regular antenatal checkup, deliveries under medical supervision and proper postnatal health checkup.<sup>10</sup>

Despite being one of the first countries of the world to launch maternal health programme, India is still struggling with a high maternal mortality and morbidity due to low utilization of services.<sup>11</sup> The present study was an attempt to find the utilization of antenatal health care services, its impact on birth weight of newborn and the role of socio-economic and demographic factors in its utilization.

In the present study, 100% of pregnant women registered their pregnancy at any health facility for health check-up. However, the proportion of early registration was not quite impressive as only 37.88% of the mothers registered during the first trimester. This is similar to the findings of DLHS-3 (2007-08), Rajasthan and Jodhpur district in which 1<sup>st</sup> trimester registration was 32.7% and 31.7% respectively.<sup>12</sup> The significance of the finding lies in the fact that even after 5 years of DLHS-3 and the presence of Janani Suraksha Yojana the early registration of pregnancy has not improved as expected. This demands the needs of amendment in the Janani Suraksha Yojana to make provision of early registration of

pregnancy mandatory to avail benefits under the scheme. In the present study, only 5.56 % of the participants were registered in late pregnancy (3rd trimester). This means that, in 94.44% of the cases there is still good opportunity to provide maternal health care services and most importantly correction of anemia which is the most common and important factor in the health of the both mother and foetus.

In our study, about only one third of mothers (32.83%) had four or more antenatal visits. These results are greater than that reported in DLHS-3 (Rajasthan: 27.7% and Jodhpur Rural: 24.2%). These findings are also similar to that of AHS 2012-13 of rural area, Jodhpur district (39.5%), the difference in the percentage could be because the observation of the latter is for 3 or more antenatal visits.<sup>13</sup>

It was observed in the present study that in spite of 100% antenatal registration and 97.98% tetanus toxoid coverage, the proportion of mothers who had utilized full antenatal services (minimum 4 antenatal visits, minimum one TT and minimum 100 IFA tablets taken during pregnancy) remained low (26.26%). The main reason for sluggish full ANC utilization was the low performance in IFA consumption (only 37.37% of mothers taken 100 or more IFA tablets) and limited number of antenatal visits. However, these findings were better than AHS 2012-13[13] and DLHS-3, where full antenatal coverage was as low as 9.5% and 6.6% respectively for Rajasthan. Here too the main reason for this was the low percentage of IFA consumption (Rajasthan: 12.7% and Jodhpur Rural: 7.7%) and limited ANC visits.

In the present study birth weight was recorded in 88.38% of the newborns (birth weight was not recorded in deliveries conducted at home) among these low birth weight (LBW) was observed in 12.57% of the newborns. These findings are quite encouraging when compared to the data of AHS 2012-13 according to which 36.3% and 25.4% of newborns had birth weight less than 2.5kg in Rajasthan and Jodhpur district respectively.<sup>13</sup> It is a reflection of the fact that maternal health and antenatal care play an important role in deciding baby's weight. The present study revealed that proportion of LBW babies was more (15.9%) in mothers who had not availed of full antenatal care in comparison by mothers who had utilized full antenatal care (4.1%) and this difference was statistically significant ( $P < 0.05$ ). Joshi HS also showed that birth weight was significantly associated with level of utilization of antenatal care.<sup>14</sup> He found that proportion of LBW babies was more (51.40%) in mothers who had not availed of proper antenatal care in comparison by mothers who had utilized proper antenatal care (22.15%).

In the present study it was seen that proportion of mothers who utilized full antenatal care services were significantly increased as the literacy status of the mother increased, it was 18% among illiterate mothers and 70% in graduated mothers ( $P = 0.001$ ). This observation was similar to studies done by Mumbare et al (2011) and Metgud C S et al in which utilization of full antenatal care services increased significantly with the literacy of mother.<sup>15,16</sup> Similar result was also found in NFHS-3 India.<sup>17</sup> This association is probably because the level of education of mothers has a greater effect on the awareness and utilization of health care services by them. Study by Chauhan A et al also found that women with 11 or more years of schooling had a ten times more likelihood for getting full ANC as compared to illiterate mothers.<sup>18</sup> Education by imparting awareness and autonomy to the women encourages utilization of maternal services and leads to demand for maternal health care services.

It was also observed in the present study that 42.9% of mothers of class I utilized full ANC compared to 17.2% of mothers belonging to class IV, this difference was not statistically significant ( $P = 0.350$ ). Similarly, rural middle class and rich mothers were found more likely to attend ANC than their poor counterparts according to a study by Md Rahman M regarding ANC service utilization (Bangladesh, 2004).<sup>19</sup> Similar to the present study; study by Chauhan A et al observed that the mothers living with richest wealth index had more likelihood to receive full ANC coverage as compared to their poor counterparts.<sup>18</sup> Studies done by Mumbre et al and Metgud CS et al were found a significant association between SES and full ANC coverage.<sup>15,16</sup> The reasons of this finding could be because, women of higher SES are in a better position as compared to lower SES to pay for the transport to the health facility where ANC services are being provided and have not to bear the problem of loss of daily wages on the day of ANC checkup.

Utilization of full ANC was more among housewives (28.2%) compared to working mothers (9.5%) but this association was not statistically significant ( $P = 0.06$ ). This difference can also be explained on the basis of problem of loss of daily wages on the part of working mothers.

In the present study, the proportion of mothers who related to joint families were significantly more utilized full antenatal care services (31.5%) compared to mothers of nuclear families (12.8%) ( $P = 0.007$ ). This could be because in joint families even if the husband is not able to accompany the pregnant women, any other member of the family can take her to visit the nearest health facility.

In the present study revealed that full utilization of antenatal services decreased with increase in parity but difference was statistically insignificant. Similarly, study by Bhattacharjee S et al observed that mothers with lower birth order had better odds of utilizing antenatal care services as compared to their counterparts.<sup>20</sup> Study by Sharma V et al also observed a statistically significant association between utilization of ANC services and parity.<sup>21</sup> Women of parity one or two were found to be the maximum utilizers of antenatal care services. This may be because women of higher parity are usually less anxious about their pregnancy as they had children before and do not pay heed towards the importance of antenatal care.

## CONCLUSION

The present study revealed low utilization of full antenatal care services among the rural area of Rajasthan and its directly affect the birth weight of newborn. Main reasons for partial/ non utilization of ANC services were unawareness about ANC services and financial. Awareness of women is the key to improve antenatal care of pregnant women. To improve effective utilization of ANC services, we need to create awareness by IEC activities and behavior change communication, improve the quality of service delivery, along with effective monitoring and evaluation. The findings of this study may be utilized by the health managers and health care providers to address the problem of low ANC coverage.

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