

## Original Research Article

# Study of utilization of antenatal care services and its determinants among pregnant women admitted in a tertiary care hospital in Mangaluru, Karnataka, India

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## ABSTRACT

**Background:** Globally only 64% of women receive antenatal (prenatal) care four or more times throughout their pregnancy. National family health survey (NFHS) -4, brings out that in India, 21% of pregnant women utilized full ANC, ranging from 2.3-65.9% across the states. Quality health care during pregnancy and childbirth can prevent many pregnancy related deaths. The objective of the present study was to examine utilization of antenatal care services among the study subjects and find out its determinants, including out of pocket expenditure incurred on management of the pregnancies.

**Methods:** The study was conducted in a tertiary care teaching hospital among full term pregnant mothers and those who had recently delivered. Purposive sampling method was used and sample size of 368 was calculated.

**Results:** The study brought out that 100% women had their registration, 75.5% of them within 12 weeks of pregnancy. Majority of the women (69.5%) preferred private health care facility clinic for antenatal check-up. However, the utilization of various government schemes in place for the benefit of pregnant mothers were underutilized (26.6%). The study also revealed that 16.0% of the families suffered catastrophic expenditure as the cost of treatment on antenatal care and treatment went beyond household budget and they had to borrow money for the treatment.

**Conclusions:** A significant association was found between number of antenatal visits and increasing age, higher socio-economic status, higher educational status, Hindu religion, place of residence (urban), nuclear type of family and early registration.

**Keywords:** Antenatal care, Catastrophic expenditure, Early registration, Pregnancy

## INTRODUCTION

Maternal mortality refers to deaths due to complications from pregnancy or childbirth. Though, the number of women and girls who died each year from complications of pregnancy has declined from 451,000 in 2000 to 295,000 in 2017, yet over 810 women are still dying every day, while for every woman who dies, approximately 20 others suffer serious injuries, infections or disabilities.<sup>1</sup> Further, 94% of all maternal deaths occur in low and lower middle-income countries. Two regions,

sub-Saharan Africa and South Asia, account for 86 per cent of all maternal deaths worldwide. The high number of maternal deaths in some areas of the world reflects inequities in access to health services, and highlights the gap between rich and poor.<sup>2</sup>

Though the maternal mortality ratio in India has dropped from 212 deaths per 100,000 live births in 2007 to 130 deaths in 2014-16, the decline is not enough to meet the sustainable development goal (SDG) target of 70 deaths per 1,00,000 live births, and only three states-Kerala,

Maharashtra and Tamil Nadu have been able to meet this target till date.<sup>3</sup> According to National Family Health Survey (NFHS-4), only 16.7% women in rural India and 31.1% women in urban India received Ante-natal care (ANC). Consequently, 50.3 percent pregnant women and 58.4 percent of children aged 6-59 months had iron-deficiency anemia - a major cause of maternal deaths, preterm births and mortality of infants.<sup>4</sup>

Pregnant mothers who do not receive good quality ante natal care (ANC) have been found to be more at risk of having low birth weight babies and there is clear association between peri-natal mortality rate, infant mortality rate and lack of or poor quality of ANC.<sup>5</sup> In India, the reproductive and child health programme (RCH) II, as well as National Health Mission (NHM) aim at providing quality ANC which includes minimum of 4 ANC visits, early registration, physical and abdominal examinations, hemoglobin percent estimation, urine investigation, two doses of tetanus toxoid (TT) immunization and consumption of iron folic acid (IFA) tablets for 100 days.

Interestingly, NLSF-4 reveals that in Karnataka, though the proportion of women who received four or more antenatal care visits has slightly increased but the percentage of women who had their first antenatal care visit in the first trimester of pregnancy for their last birth has decreased substantially in the 10 years since NFHS-3 (from 71% to 66%). Further, 84% of the pregnant mothers received iron and folic acid (IFA) supplements, but only 45% consumed them for the recommended 100 days.<sup>7,8</sup>

Studies bring out that demographic and socio-cultural factors influence the utilization of antenatal care, which include maternal age, education, place of residence, occupation, socioeconomic status, and religion etc. Therefore, there is a need to find out important factors which determine the utilization of ANC.

With this background, the present study was undertaken to evaluate the utilization of ANC services and its determinants among full term pregnant women and recently delivered women (RDW) admitted in a tertiary care hospital in Mangaluru.

### ***Aims and objectives***

Aims and objectives were to study the demographic characteristics of full term and recently delivered mothers admitted in tertiary care centre in Mangaluru, study the pattern of utilization of antenatal care services amongst the study subjects, to study various determinants and barriers which had an effect on utilization of antenatal care services and find their association and to find out of pocket expenditure incurred during pregnancy and childbirth by the respondents.

## **METHODS**

This is the hospital based, cross sectional, observational descriptive study with full-term ante natal women and recently delivered women (RDW) attending tertiary care teaching hospital. Conducted from 22<sup>nd</sup> August 2019 to 21<sup>st</sup> October 2019 at obstetric and gynecology ward of teaching hospital.

### ***Study tools***

A predesigned, pretested and validated structured questionnaire. All relevant patient records i.e. antenatal card, laboratory investigation reports and all available prescriptions from all doctors.

### ***Study technique***

#### ***Interview method***

All full-term women attending the obstetric OPD as well as those who were admitted in the obstetric ward in the hospital, were interviewed and their records were examined and the details were recorded in the questionnaire.

#### ***Inclusion criteria***

All full-term women attending OBG OPD as well as RDW, not seriously ill and willing to participate, and gave informed written consent.

#### ***Exclusion criteria***

Other admitted women, those critically ill, not-motivated, un-willing to participate.

#### ***Sampling technique***

Purposive sampling technique was used.

#### ***Sample size calculation***

All full term pregnant and RDW meeting the study criteria were included in the study. As the total number of deliveries conducted per month in present teaching hospital during 2018 was 230, while the period of data collection of proposed study was to be two months; the sample size of the study came out to be 460. Taking into account a non-response rate of 20%, the final sample size for the proposed study came out to be 368.

#### ***Data collection***

The informed written consent of the study population was obtained after explaining the purpose and nature of the study. They were assured about their confidentiality and anonymity. They were also told that their participation will be voluntary and not compulsory. Then the principal investigator conducted face-to-face interview to fill up the

questionnaire. Additional information was also noted after consulting the necessary records.

### Variables

Socio demographic profiles (age, religion, residence, type of family, parity, education, occupation, per capita monthly income converted to socio economic classification as per modified BG Prasad scale 2018) and numbers of antenatal check-up, timing of registration, TT immunization, consumption of IFA tablets, laboratory investigations done and counseling given.

### Statistical analysis

Data was entered into Microsoft excel and analyzed using the statistical package of social sciences (SPSS) version 22.0. The results have been presented with the help of tables/figures and bar diagrams. Frequency and percentage for categorical variables has been calculated. The Chi-square test has been used to compare between the participants who took at least four antenatal care visits and who did not.  $P < 0.05$  has been considered as significant.

### Operational definitions

#### Antenatal care

According to World Health Organization ante natal care is defined as "the care provided by skilled health-care professionals to pregnant women and adolescent girls in order to ensure the best health conditions for both mother and baby during pregnancy. The components of ANC include: risk identification; prevention and management of pregnancy-related or concurrent diseases; and health education and health promotion".

**Full term pregnancy:** The World Health Organization (WHO) defines normal term for delivery as from 37 completed weeks to less than 42 completed weeks (259-293 days) of gestation.

**RDW (recently delivered woman):** For the purpose of this study a post-natal woman who has delivered within 7 days of the data collection period, was considered as RDW.

**Utilization of antenatal care:** Having made at least one antenatal visit before delivery.

**Early registration of antenatal care:** Within the first trimester of pregnancy (during the first 12 weeks of pregnancy)

**Complete ante-natal care:** Complete ANC includes minimum of four visits to ANCs, early registration in first trimester along with physical and abdominal examinations, Hb estimation and urine investigation, two

doses of TT immunization and consumption of IFA tablets for 100 days.

**Parity:** The number of times that the woman has given birth to a foetus with a gestational age of 20 weeks or more, regardless of whether the child was born alive or stillborn.

**Catastrophic health expenditure (CHE):** Health expenditures that were greater than the 10% of total household expenditure.

## RESULTS

The results of the of the study after analyzing the data have been divided into three parts i.e. The demographic characters of the study subjects, the pattern of utilization of antenatal services and association between ante-natal visits (four visits or more) and certain selected socio demographic variables.

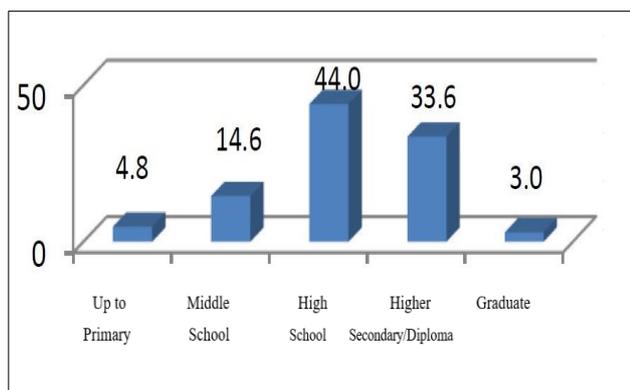
**Table 1: Socio demographic characteristics of the study population (n=368).**

Socio-demographic variable	Frequency	Percentage
<b>Age in years</b>		
<20	59	16.6
20-30	191	51.9
>30	118	32.0
<b>Occupation</b>		
House wives	315	85.5
Working	53	14.4
<b>Religion</b>		
Muslim	262	71.1
Hindu	106	28.8
<b>Type of family</b>		
Nuclear	182	49.4
Joint	186	50.5
<b>Place of residence</b>		
Urban	130	35.3
Rural	238	64.6
<b>BPL card</b>		
Yes	131	35.5
No	237	64.4
<b>Health insurance</b>		
Yes	32	8.6
No	336	91.3
<b>Member of any self-help group</b>		
Yes	15	4.0
No	353	95.9
<b>Parity</b>		
Primipara	121	32.8
Multipara	247	67.1

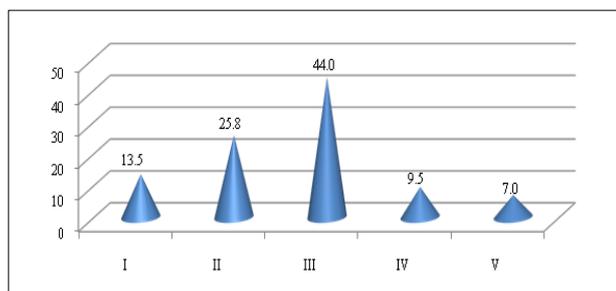
### Demographic characters of study population

The study brings out that 51.9% of the women under study belonged to 20-30 years age group, while 32.0%

and 16.6% of the women belonged to >30 years and <20 years age group respectively. Further, 85.5% of the women were housewives, while remaining 14.4% of them were engaged in some work or service. The study further reveals that 13.5% of them belonged to social class -I, 25.8% belonged to social class -II, 44.0% belonged to social class -III, 9.5% belonged to social class IV, while remaining 7.0% of them belonged to social class -V. The breakdown of educational status of the women under study showed that majority of them were high school i.e. 44.0%, 33.6% were higher secondary while 3.0 % were graduates. Kindly replace the highlighted sentences with above sentence only. The study further brings out that 71.1% of the women were Hindu, 28.8% were Muslim, 64.6% belonged to rural area, 35.5% belonged to urban area, 67.1% were multipara, 32.8% were primipara, 35.5% held Below poverty line (BPL) card and 50.5% of them belonged to joint families. It was further seen that only a small percentage (8.6%) of the women under study had made use of available government schemes and only 4.0% of them were member of some self-help group (Table 1, Figure 1 and 2).



**Figure 1: Educational status of subject women (n=368).**



**Figure 2: Socio-economic status of subject women (n=368)\*.**

\*Modified BG Prasad classification of socio-economic status.

**Utilization of antenatal services**

It is seen from the study that 75.5% of the women had their registration done within 12 weeks of pregnancy while all of them (100%) had their health check-up done whenever they visited an antenatal clinic. The study also

reveals that in majority of the cases (68.75%) the doctor only carried out antenatal check-up, while in remaining 29.0% of the cases para-medical staff carried out the physical examination. It was also seen that 74.1% of the women under study had four or more visits to the antenatal clinics while remaining 25.8% of the women had three or a smaller number of visits.

**Table 2: Utilization of antenatal services by the study population (n=368).**

Utilization of antenatal services	Frequency	Percentage
<b>Early registration</b>		
<12 weeks	278	75.5
>12 weeks	90	24.4
<b>Did you receive health check-up during your every visit to ANC clinic?</b>		
Yes	368	100
No	Nil	NA
<b>Who examined you during the visit</b>		
Doctor	253	68.7
ANM	107	29.0
Others	08	2.1
<b>Number of antenatal visits</b>		
One to three	95	25.8
Four and above	273	74.1
<b>Tetanus toxoid due doses</b>		
Given	331	89.9
Not given	37	10.0
<b>IFA tablets were taken during pregnancy</b>		
Yes	313	85
No	55	14.9
<b>Facility of antenatal check-up done</b>		
Private clinic	256	69.5
Government hospital	112	30.4
<b>Reason for choosing private clinic (n=256)*</b>		
Behaviour of staff	210	82.0
Distance	119	46.4
Quality of service	221	86.3
Others	189	73.8
<b>Reason for choosing government hospital (n=112) *</b>		
Affordability	87	77.6
convenience	94	83.9
Other reasons	77	68.7
<b>Distance of clinic from home</b>		
<5 kilometres	190	51.6
>5 kilometres	178	48.3
<b>Out of packet expenditure on treatment</b>		
<10% of total household expenditure	309	83.9
>10% of total household expenditure	59	16.0
<b>Did you utilize any Government schemes like JSY /ICDS/PMMSY</b>		
Utilized	98	26.6
Not utilized	270	73.3

\*Multiple responses.

**Table 3: Association between antenatal visits (four visits or more) and socio-demographic variables (n=368).**

Demographic variables	Yes (n=273)		No (n=95)		Total (n=368)		P value
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
<b>Age (in years)</b>							
<20	45	16.4	14	14.7	59	16.6	<0.001
21-30	132	48.3	59	62.1	191	51.9	
>30	96	35.1	22	23.1	118	32.0	
<b>Educational status</b>							
Up to primary	11	4.0	7	7.3	18	4.8	<0.001
Middle school	38	13.9	16	16.8	54	14.6	
High school	97	35.5	23	24.2	120	32.6	
Higher secondary/ diploma	93	34.0	31	32.6	124	33.6	
Graduate and above	34	12.4	18	18.9	52	14.1	
<b>Place of residence</b>							
Urban	89	32.6	41	43.1	130	35.3	<0.001
Rural	184	67.3	54	56.8	238	64.6	
<b>Socio-economic status</b>							
I	39	14.2	11	11.5	50	13.5	<0.001
II	67	24.5	28	29.4	95	25.8	
III	129	47.2	33	34.7	162	44.0	
IV	21	7.6	14	14.7	35	9.5	
V	17	6.2	09	9.4	26	7.0	
<b>Time of registration</b>							
Early	197	72.1	81	85.2	278	75.5	<0.001
Late registration	76	27.8	14	14.7	90	24.4	
<b>Type of family</b>							
Nuclear	119	43.5	63	66.3	182	49.4	<0.001
Joint	154	56.4	32	33.6	186	50.5	
<b>Religion</b>							
Hindu	198	72.4	64	67.3	262	71.1	<0.001
Muslim	75	27.4	31	32.6	106	28.8	
<b>Occupation</b>							
House wife	234	85.7	81	85.2	315	85.5	<0.001
Service	39	14.2	14	14.7	53	14.4	

Further, 89.9% of the women had received two doses of Tetanus Toxoid as well as iron and folic acid tablets during their pregnancy. The study further reveals that 69.5% of the women visited private clinic for antenatal check-up while remaining 30.4% preferred government hospitals. Behaviour of the staff and quality of service were cited as the main reasons for choosing a private facility by 82.0% and 86.3% of the women respectively. The main reasons for choosing government hospital were affordability (77.6%) and convenience (83.9%). It was further seen that 48.3% of the women had to travel more >5 kilometers to visit an antenatal clinic; while 16.0% of the families had to arrange money for treatment and delivery by taking loans; which caused them financial hardships. The study also brought that only 26.6% of the women utilized the various government schemes which are in place meant for antenatal women (Table 2).

One of the objectives of this study was to find out if antenatal visits are significantly associated with any particular demographic characters i.e. age, educational status of the pregnant women, their socio-economic

status, type of family, occupation, religion, place of residence and finally the time of registration etc. Accordingly, two hypotheses were formed as under.

## DISCUSSION

The first time a new-born is placed in her mother's arms is a moment of joy - a joy that every mother should have the right to experience. Without the right care, becoming a mother can be a stressful and, in the worst cases, a tragic, event. The World Health Organization (WHO) envisions a world where "every pregnant woman and new-born receives quality care throughout the pregnancy, childbirth and the postnatal period" Women's positive experiences during ANC and childbirth can create the foundations for healthy motherhood. World Health Organization in its recommendation "antenatal care for a positive pregnancy experience - 2016, brings out that early registration is very crucial for quality ante-natal care and a positive pregnancy experience, as it will not only help in early detection of all existing health problems but also predict those which are likely to come up during

pregnancy and thereby enable us treat and prevent them.<sup>10</sup> Present study was intended at exploring the utilization of ante natal services and to find out its determinants among women attending a tertiary care hospital in southern part of the country.<sup>9,10</sup>

Analysis of data in present study brings out that majority of the respondents (51.9%) were in the age group 20-30 years, 85.5% were house wives, 71.1% were Hindu by religion, 50.5% belonged to joint families, 35.5% possessed a BPL card, 64.6% came from rural background and only 8.6% of them utilized various schemes like Pradhan Mantri Matru Vandana Yojana (PMMVY), Pradhan Mantri Matru Vandana Yojana (PMMVY), Janani Suraksha Yojana (JSY), ICDS etc. Educational status of these women was also found to be good as 84.6% of them were educated up to high school or above. Further 69.8% of this study women belonged to social class II/III.

In a similar study in Gujarat in 2017, Jogia et al, observed that 81.54% of the pregnant women were in the age group of 20-30 years, 82.31% were house wives, 87.7% were Hindu by religion while 72.46% belonged to rural area. Similar demographic characteristics were also reported by Jogia et al, from western India, Roy et al, in their study at Lucknow, Dorji et al, in Bhutan et al and Shruthi et al from Kerala.<sup>11-14</sup>

Present study brought out 100% registration of pregnancy among study subjects, out of which 75.5% were registered within 12 weeks, -100% of them received antenatal check-up, 68.7% were examined by doctors, 89.9% of the women received injection tetanus toxoid and iron therapy, while 74.1% of the respondents made four or more visits to ante natal clinics. The location of clinics was found to be <5 km in 51.6% cases, while 16.0% of the families had to arrange for the cost of treatment by taking loans from friends and relatives and were subjected to financial hardships.

In a similar study by Mausumi et al, in Kolkata, they found that 100% participants were registered, 65.26% of them had early registration, 91.05% had three ANC visits and all of them had had received Tetanus Toxoid and iron and folic acid therapy. Similar findings were also reported by Banerjee et al, at Kolkata, Javali et al, in Karnataka and Roy et al, at Lucknow.<sup>12,15-17</sup>

In present study, 69.5% of the women visited private clinics for ante natal care and the reason cited were mainly the behavior of the doctors and quality of services. A smaller percentage (30.4%) of the women who visited government facility cited mainly the financial reasons for priority for visiting public health hospitals or clinics. In contrast to study findings, Sugumaran et al, in their study, titled, "pattern of utilization of antenatal care services in a rural area of Tamil Nadu: a community based cross-sectional study" observed utilization of private clinics by the respondents to be only 5.3%. In another study by

Ghosh-Jerath, et al, titled, "ante natal care (ANC) utilization, dietary practices and nutritional outcomes in pregnant and recently delivered women in urban slums of Delhi, India: an exploratory cross-sectional study" it was observed that 75% women availed ANC from a public health facility which is in contrast to this study. Jallow et al, in their study at Gambia reported that pregnant women attending either public or private clinics differed significantly in their preferred type of provider and generally showed a high level of in this regard, more women (20.1%) in the public clinics were dissatisfied than their counter parts in the private clinics (2.1%).<sup>18-20</sup>

In this study, expectedly the utilization of various government benefit schemes meant for pregnant mothers like JSY/ICDS/PMMSY etc. was found to be very low (26.6%) among the study subjects. In contrast to this findings in a study by Angadi et al, in Karnataka, 57% of the mothers had utilized Janani Suraksha Yojana, 29% of mothers had utilized Prasuthi Araiike Yojana, 65% of mothers had utilized Madilu Yojana but none of mothers had utilized Thaiy Bhagya schemes. The major source of information was health care workers. Major reason for non-utilization of maternity benefit schemes was lack of awareness.<sup>21</sup>

Four or more antenatal visits during pregnancy, is considered a good indicator of quality of antenatal care. In this study, an effort was made to find an association between four (or more) antenatal visits with certain selected demographic variables; and it was observed that women who made four (or more) antenatal visits during pregnancy were significantly associated with higher age, higher educational status, higher SES, early registration of pregnancy, urban place of residence, nuclear families, Hindu religion and working (occupation) women. Similar findings were reported in their study by Basu et al, from Kolkata who found that increased age was associated with a greater number of antenatal visits. These findings have also been supported by studies by Birmeta et al, from Ethiopia and Zhao Q et al, from Shanghai.

Further, a study by Roy et al, brings out only age and timings of registration as main predictors of antenatal care visits, while John et al in their study found literacy ( $p=0.04$ ), birth order ( $p<0.001$ ), Janani Suraksha Yojana beneficiaries ( $p=0.048$ ), and availability of health infrastructure, staff, and services ( $p=0.023$ ) as the main determinants of utilization of antenatal care. In another study by Kakati et al, in Assam, utilization of antenatal care services was found to be significantly associated with the age of the women, religion, caste, socioeconomic class, place of delivery, mode of delivery and parity ( $p<0.05$ ).<sup>12,15,22-25</sup>

The study had the limitation which are inherent to all cross-sectional studies as no follow up of these cases as undertaken. Further, it was institution based, hence the findings cannot be considered as true representation of the community. Finally, information bias cannot be ruled

out in this study as many women for reasons of privacy or other considerations may not have revealed the information in its complete form.

## CONCLUSION

Present study brings out that all the women under study were educated, and all of them had registered. Further, majority of them (three-fourth) made four or more visits to antenatal clinics, which are the current recommendations of our national RCH-II programme. Majority of them had also undergone routine investigations and received Tetanus toxoid and iron and folic acid therapy. The utilization of government facility was found to be sub-optimal. A significant association was observed between antenatal visits (four or more) and higher educational levels, higher socio-economic status, type of family, religion, place of residence and occupation of women. The study also brings out gross under-utilization of government schemes meant to benefit pregnant mothers. Needless to say that improving the socio-economic status of women would improve the utilization of antenatal care.

## Recommendations

The study brings out the need for intensified and targeted awareness programs for pregnant women - firstly on the importance of antenatal visits and utilization of various services, and secondly on various governmental schemes in place, run by central as well as state government for the benefit of pregnant mothers. The study also brings out poor utilization of government clinics/hospitals by the study subjects, which perhaps re-emphasizes the need for introspection and take remedial measures by higher authorities.

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