Original Article

DOI: 10.7860/JCDR/2022/58290.16755

Community Section

Utilisation of Antenatal Care Services and its Determinants among Pregnant Women Attending Tertiary Care Hospital in Western India: A Cross-sectional Study

NITIN LODHA

ABSTRACT

Introduction: Good quality Antenatal Care (ANC) is not uniformly distributed in the community. A better ANC coverage not only ensures a safer outcome from pregnancy but also provides a platform for improving the health status of mother and baby.

Aim: To assess the utilisation of ANC services among the pregnant women and to study the associated factors related to utilisation of ANC.

Materials and Methods: This was a hospital-based cross-sectional study conducted among 250 full term pregnant women in tertiary care hospital in Vadnagar, Gujarat, India from June 2021 to August 2021. Systemic random sampling technique was adapted to select required participants. Women were interviewed, using predesigned and pretested semi-structured proforma, to assess the ANC received by them. Categorical variables were expressed as frequency and proportions, continuous variables as mean and standard deviation. Chi-square test was used to found association between comprehensive ANC and various determinants affecting it and logistic regressions were applied to find out the predictors.

Results: Mean age of the participants were 25.31±4.09 years. A total of 205 (82%) of participants were literate and 210 (84%) pregnant women were from rural area. About 69.2% participants belonged to joint family and 92.4% were housewife. Majority of the participants were from class IV (63.6%) and V (16%) socio-economic class. About 66% participants were multigravida. All study participants were registered. A 87.2% women had early registration of pregnancy (within 12 weeks), 93.6% had atleast four ANC visits, 98.4% had taken two doses or one booster dose of Tetnus Toxoid (TT) injections and 71.2% women had taken minimum 100 iron and folic acid tablets. Total 69.2% of the mothers had received the full ANC. Significant relation was found between utilisation of full ANC with age of women, residence area, education, socio-economic class and parity.

Conclusion: Full ANC utilisation was inadequate. Most of the indicators seemed better, only Iron Folic Acid (IFA) tablets consumption was poor. There is a need for intensified and targeted awareness programs for pregnant women on the importance of antenatal visits and utilisation of various services.

Keywords: Antenatal care visit, Early registration, Iron folic acid, Pregnancy

INTRODUCTION

Healthy newborn in any community depends mainly on ANC received by the mother during her pregnancy. Also, maternal mortality and neonatal mortality in a community is influenced by antenatal services provided and utilised in the community. The primary aim of ANC is to achieve at the end of pregnancy a healthy mother and a healthy baby by promoting, protecting and maintaining health of the mother during pregnancy, by identifying high risk cases and by foreseeing complications to prevent them early [1]. ANC can be defined as care provided by skilled healthcare professionals to pregnant women 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, health education and health promotion. ANC reduces maternal and perinatal morbidity and mortality both directly, through detections, and indirectly, through identification of women at increased risk of developing complications during labour and delivery, thus ensuring referral to an appropriate level of healthcare [2].

The country has been witnessing a progressive reduction in Maternal Mortality Ratio (MMR). MMR of India has declined over the years to 103 in 2017 to 2019 from 113 in 2016 to 2018, 122 in 2015 to 2017 and 130 in 2014 to 2016, as per Special Bulletin on MMR released by the Registrar General of India. With this persistent decline, India is on the verge of achieving National Health Policy-2017 target of 100/lakh live births by 2020 and certainly on track to achieve the sustainable development goals target of 70/lakh live births by 2030 [3]. Although the health status of women has improved over the years due to concentrated efforts of Government, it is still not at par with the international benchmark and is unacceptably high. Health outcome goals established in the 12th five-year plan are to reduce infant mortality rate to 25 per 1000 live births, to reduce MMR to 100 per 100,000 live births by 2017 but this goal of MMR is still not achieved, currently it is 103 per 100,000 live births [4]. In India, the results of a large-scale nationwide cross-sectional survey (2015-2016) revealed that full ANC was provided to only 21% women during their previous pregnancy [5]. Recently, a study done by Rustagi R et al., observed 53% participants had comprehensive ANC service utilisation [6].

A good quality ANC service is not uniformly distributed in society. There is a sharp distinction between states and between rural and urban areas. Full utilisation of ANC services is highest in Lakshadweep (65.88%), while it was lowest in Nagaland (2.36%). Similarly in rural area utilisation of ANC services was low as compared to urban area. In rural areas, early registration was 76.1%, minimum four ANC visits was 44.8%, TT vaccination coverage was 82.4% and IFA tablets consumption was 25.9% only, while in urban areas, early registration was 82.3%, minimum four ANC visits was 66.4%, TT vaccination was 84.4% and IFA tablets consumption was 40.8% [5,7]. This could be related to non utilisation or underutilisation of maternal healthcare services, especially amongst rural poor and urban slum due to inaccessibility, illiteracy, cultural factors which have significant relationship as a determinant of maternal and child

health in population [8,9]. Pregnant mothers who do not receive good quality ANC services have been found to be more at risk of having low birth weight babies and there is clear association between perinatal mortality rate, infant mortality rate and lack of or poor quality of ANC [10]. Better ANC service coverage not only ensures a safer outcome from pregnancy but also provides a platform for improving health status of mother and baby as both are considered as a single unit [11,12].

Successful implementation of all maternal health related programs depend on adequate awareness and understanding of determinants that affects the utilisation of ANC services during pregnancy. To improve maternal health, barriers that limit access to quality maternal health services must be identified and addressed at all levels of health system. With this background, the present study was conducted with an aim to assess utilisation of ANC services and various determinants that affects utilisation of ANC services among full term pregnant women and recently delivered women.

MATERIALS AND METHODS

This was a hospital-based cross-sectional study conducted among full term pregnant women in tertiary care hospital in Vadnagar, Gujarat, India. The study was carried out from June 2021 to August 2021. The study was approved by the Institutional Ethical Committee (IEC) of Medical College (IECHR/APPROVAL/2967/2021).

Inclusion criteria: Full term pregnant women who came for routine antenatal check-up in Obstetric Outpatient Department (OPD) and recently delivered women admitted in a tertiary care hospital were included in the study.

Exclusion criteria: Pregnant women who were severely ill, and not willing to participate in the study were excluded.

Sample size calculation: As per National Family Health Survey-4 (NFHS-4) data, the mothers who had comprehensive ANC care in Gujarat was 30.66%. Based on this prevalence and at 95% confidence interval, with a precision of 10%, the required calculated sample size was around 228 which were rounded off to 250 subjects [5]. Systemic random sampling technique was adapted to select recently delivered women and full term pregnant women who came for antenatal check-up.

Study Procedure

Before taking information, informed consent was obtained from study participants and they were assured of confidentiality and privacy of records. Full-term women attending the obstetric OPD as well as those who were admitted in the obstetric ward in the hospital were interviewed. Data collection was done through oral questionnaire method using predesigned and pretested semi-structured proforma, validated by an expert. The questionnaire contained two parts. Part 1 consisted of details regarding socio-demographic and obstetric profile of participants, while part 2 contained questions regarding ANC utilisation during current pregnancy. For ANC utilisation, information was recorded that included-registration of pregnancy, number of antenatal visits, tetanus vaccination, and IFA tablets consumption. Socio-economic status was assessed as per Modified BG Prasad Classification [13]. Mamta card of pregnant women was asked for recording required information [5].

Comprehensive ANC was defined as registration of pregnancy within 12 weeks, attending a healthcare facility for atleast four ANC visits, taking two doses of tetanus toxoid, and atleast 100 days of iron-folic acid tablet consumption [14-16].

STATISTICAL ANALYSIS

The data were analysed using MS excel 2010 version and Epi info version 7.2.5.0. Categorical variables were expressed as frequency and proportions, continuous variables as mean and standard deviation. Chi-square test was used to found association and logistic regressions were applied to find out the predictors. Results were expressed in terms of odds ratio and Confidence Interval (CI). The p-value ≤0.05 was considered statistically significant.

RESULTS

The total study participants were 250 pregnant women. The mean age of the participants were 25.31±4.09 years. Majority of the participants 204 (81.6%) were Hindu, 178 (71.2%) had education upto primary level, 210 (84%) were from rural area, and 173 (69.2%) belonged to joint family. Total of 63.6% participants were from the class IV socio-economic status. Most of the participants (92.4%) were housewives and around 60% of participant's husbands had education upto primary school. Majority (66%) were multigravida, and among them 72.1% had pregnancy interval ≤3 years [Table/Fig-1].

Variables	Categories	Frequency n (%)
Age (years)	≤20	28 (11.2)
	21-25	106 (42.4)
	26-30	93 (37.2)
	>30	23 (9.2)
Mean±SD	25.31±4.09 years	
Religion	Hinduism	204 (81.6)
	Islam	46 (18.4)
Education	Illiterate	45 (18)
	Upto primary	178 (71.2)
	Upto secondary	21 (8.4)
	Graduate	06 (2.4)
Locality	Rural	210 (84)
	Urban	40 (16)
Family type	Joint	173 (69.2)
	Nuclear	77 (30.8)
Social class	I	09 (3.6)
	II	10 (4)
	III	32 (12.8)
	IV	159 (63.6)
	V	40 (16)
Occupation	Housewife	231 (92.4)
	Employed	19 (7.6)
Husband's education	Illiterate	14 (5.6)
	Upto primary	150 (60)
	Upto secondary	76 (30.4)
	Graduate	10 (4)
Gravida	Primi	85 (34)
	Multi	165 (66)
Pregnancy interval (n=165)	≤3 years	119 (72.1)
	>3 years	46 (27.9)

[Table/Fig-1]: Socio-demographic and obstetric profile of study participants (N=250).

All study participants were registered and all women had their Mamta card. Total 218 (87.2%) women had early registration of pregnancy, and 12.8% women had pregnancy registration after first trimester. About 234 (93.6%) participants had atleast four ANC visits during this pregnancy. Most of the study participants (98.4%) had taken two doses or one booster dose of TT injections. About 178 (71.2%) women had taken minimum hundred IFA tablets during their antenatal period [Table/Fig-2]. About 173 (69.2%) of the mothers had received the full ANC (had early registration of pregnancy, minimum of four ANC visits, taken two doses or one booster dose of TT and taken 100 IFA tablets).

On comparison between profiles of the women who had utilisation of full ANC and who did not, significant difference was found with age, education, residence area, socio-economic class, parity and pregnancy interval [Table/Fig-3]. On simple logistic regression,

Variable	Categories	Frequency n (%)
Early registration	≤12 weeks	218 (87.2)
	>12 weeks	32 (12.8)
Antenatal visit	<4	16 (6.4)
	≥4	234 (93.6)
TT injection	Received	246 (98.4)
	Not received	4 (1.6)
IFA supplements	≥100 tablets	178 (71.2)
	<100 tablets	72 (28.8)

[Table/Fig-2]: Utilisation of antenatal services among study participants (N=250).

significant relation was found between utilisation of full ANC with age, residence area, education, socio-economic class and parity. Women with age >25 years, from rural area, higher education, socio-economic class, and high parity were found to be more likely to get full ANC services [Table/Fig-4].

Variables	Categories	Full ANC utilisation		Total (%) (N=250)	Test statistics
		Yes n (%) (n=173)	No n (%) (n=77)		
Age (years)	≤20	16 (57.1)	12 (42.9)	28 (11.2)	χ^2(df)=10.625(9) p-value=0.013
	21-25	84 (79.2)	22 (20.8)	106 (42.4)	
	26-30	61 (65.6)	32 (34.4)	93 (37.2)	
	>30	12 (52.2)	11 (47.8)	23 (9.2)	
Religion	Hinduism	137 (67.2)	67 (32.8)	204 (81.6)	χ^2(df)=2.171(1) p-value=0.140
	Islam	36 (78.3)	10 (21.7)	46 (18.4)	
Education	≤8 years	149 (66.8)	74 (33.2)	223 (89.2)	χ^2(df)= 5.505(1) p-value=0.018
	>8 years	24 (88.9)	3 (11.1)	27 (10.8)	
Locality	Rural	156 (74.3)	54 (25.7)	210 (84)	χ^2(df)=15.927(1) p-value <0.05
	Urban	17 (42.5)	23 (57.5)	40 (16)	
Family type	Joint	116 (67.1)	57 (32.9)	173 (69.2)	χ^2(df)=1.215(1) p-value=0.270
	Nuclear	57 (74)	20 (26)	77 (30.8)	
Social class	High (Class I-III)	42 (82.4)	9 (17.6)	51 (20.4)	χ^2(df)=5.20(1) p-value <0.05
	Low (Class IV-V)	131 (65.8)	68 (34.2)	199 (79.6)	
Occupation	Housewife	163 (70.6)	68 (29.4)	231 (92.4)	χ^2(df)=2.972(1) p-value=0.084
	Employed	10 (52.6)	9 (47.4)	19 (7.6)	
Husband's education	Illiterate	118 (72)	46 (28)	164 (65.6)	χ^2(df)=1.693(1) p-value=0.193
	Graduate	55 (64)	31 (36)	86 (34.4)	
Gravida	Primi	48 (56.5)	37 (43.5)	85 (34)	χ^2(df)=9.791(1) p-value=0.001
	Multi	125 (75.8)	40 (24.2)	165 (66)	
Pregnancy interval (n=165)	≤3 years	96 (80.7)	23 (19.3)	119 (72.1)	χ^2(df)=5.613(1) p-value=0.017
	>3 years	29 (63)	17 (37)	46 (27.9)	

[Table/Fig-3]: Comparison of the profile of women based on full ANC utilisation. p-value <0.05 considered significant

Determinant		Total	Comprehensive ANC not received (n=77) n (%)	OR (95% CI)	p-value
Age (years)	≤25	134	34 (25.4)	0.57 (0.33-0.99)	0.046
	≥26	116	43 (37.1)	1	
Locality	Rural	210	54 (25.7)	0.25 (0.12-0.51)	0.0001
	Urban	40	23 (57.5)	1	
Education (years)	≤8 years	223	74 (33.2)	3.97 (1.15-13.62)	0.028
	>8 years	27	3 (11.1)	1	
Working status	Housewife	231	68 (29.4)	0.46 (0.18-1.19)	0.110
	Employed	19	9 (47.4)	1	
SEC	High (Class I-III)	51	9 (17.6)	0.41 (0.18-0.89)	0.025
	Low (Class IV-V)	199	68 (34.2)	1	
Husband's education	≤8 years	164	46 (28)	0.69 (0.39-1.20)	0.194
	>8 years	86	31 (36)	1	
Family type	Joint	173	57 (32.9)	1.40 (0.76-2.55)	0.271
	Nuclear	77	20 (26)	1	
Gravida	Primi	85	37 (43.5)	2.40 (1.37-4.20)	0.002
	Multi	165	40 (24.2)	1	
Pregnancy interval (n=165)	≤3 years	119	26 (21.8)	0.99 (0.43-2.27)	0.991
	>3 years	46	10 (21.7)	1	

[Table/Fig-4]: Logistic regression analyses for the predictors of full antenatal coverage. p-value <0.05 considered significant

DISCUSSION

Antenatal Care (ANC) is the care of woman during her pregnancy. ANC is one of the most effective health interventions for preventing maternal mortality and morbidity. ANC provides a unique opportunity for screening and diagnosis, health promotion and disease prevention among the pregnant women. Also, utilisation of ANC services and institutional delivery are dependent on so many factors like social, cultural and administrative factors. Present study was intended at exploring the utilisation of ANC services and to find out its determinants among women. Analysis of data brings out that majority of the participants were from 21-30 years of age group. Majority of them were literates with only 18% were illiterate. Majority of participants were from rural area. This information is required to understand the target audience. Majority of the participants belonged to lower socio-economic class. Most of them lived in joint family. Most of the women were housewife. Around one third of women were primigravida and in those women who were multigravida, majority of women had pregnancy interval less than 3 years. Similar demographic characteristic were also reported by Kumar H et al., Roy MP et al., and Sruthi MV and Bablu R in their studies [17-19].

The study found that all the studied participants got themselves registered and all had Mamta card. The extent of registration was in accordance with finding of previous studies done by Chethana K et al., and Madhu K et al., [20,21]. Early registration of pregnancy was seen in 87.2% participants. Tellis SB et al., recorded early registration was 78.3% which was lower than present study finding [22]. Early registration has very much impact on outcome of pregnancy in term of health of both mother as well as her baby. Early registration provide a good opportunity to provide package of antenatal service in early phase of pregnancy, in this study it is around 87.2% which needs to improve and reached upto 100%. Current study revealed that 93.6% participants had the minimum four antenatal visits, which was similar to the results obtained by Chethana K et al., where 91.5% had completed minimum four antenatal visits [20]. Swetha NB et al., reported 98.6% had minimum four antenatal visits, which higher than current study [23]. TT immunisation among participants was 98.4%. This finding was in accordance with finding of Chethana K et al., in which they reported 98.6% coverage [20]. However Kumar H et al., observed 89.8% coverage which was lower than finding of current study [17]. Adequate IFA supplementation was received by 71.2% of the women, which was similar to the finding of Swetha NB et al., and Poornima C and Ranganath TS [23,24]. On further investigation, present study found that the reasons for incomplete or partial consumption of IFA tablets said by women were the side-effects of tablets, forgetfulness and very few reported limited supply.

In connection with the objective of study, it was found that comprehensive ANC utilisation was seen among 69.2% participants and it was lacking in nearly one third of the participants. This finding was consistence with finding of Mumbare SS and Rege R who observed 64.76% adequate utilisation of ANC services [25]. Similar study done by Rustagi R et al., observed 53% participants receiving comprehensive ANC [6]. The most potential reason for not receiving comprehensive ANC was found to be lack of awareness about full ANC package, other reasons was fear of side-effects of TT injections and IFA tablets. On comparison with similar other few studies that done in last decade, it was seen that early registration was highest in present study and Kakati R et al., observed lowest (53%) finding [26]. Similarly ≥4 antenatal visit among participant

Variable	Kakati R et al., [26]	Chethana K et al., [20]	Swetha NB et al., [23]	Kumar H et al., [17]	Mohanty S et al., [27]	Rustagi R et al., [6]	Present study
	2015	2020	2021	2020	2021	2021	2022
	Assam	Karnataka	Karnataka	Mangaluru	Odisha	Delhi	Gujarat
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Mean age of participants (years) (mean±SD)	-	24.6±4.0	-	-	26±4.02	25.6±3.9	25.31±4.09
Early registration (in first trimester)	159 (53)	112 (78.9)	86 (68.5)	278 (75.5)	157 (78.5)	131 (69.3)	218 (87.2)
≥4 antenatal visit	203 (68.7)	130 (91.5)	123 (98.6)	273 (74.1)	145 (72.5)	170 (85)	234 (93.6)
TT Vaccination received	294 (98)	140 (98.6)	121 (96.4)	331 (89.9)	197 (98.5)	195 (97.5)	246 (98.4)
≥100 IFA tablets supplements	215 (71.6)	118 (83.1)	86 (68.6)	313 (85)	181 (90.5)	172 (86)	178 (71.2)
Full ANC utilisation availed	-	115 (81)	-	-	-	107 (53)	173 (69.2)

[Table/Fig-5]: Comparison of ANC services utilisation with similar other studies.

also better in current study as compared to other study except study done by Swetha NB et al., in which they reported 98.6% participant had ≥4 antenatal visit [23]. TT vaccination was very high and nearly same in all mentioned study. There was wide variation seen among participants regarding IFA consumption, Mohanty S et al., reported highest IFA consumption status, while present study reported only 71.2% IFA consumption [27]. Full ANC utilisation was seen in 69.2% participants which was higher (53%), than the finding of Rustagi R et al., but lower (81%) than those of Chethana K et al., [Table/Fig-5] [6,17,20,23,26,27].

Statistically significant association was found between full ANC with age, education, residence area, socio-economic class, parity and pregnancy interval. Roy MP et al., also found significant association between ANC utilisation with education and socio-economic class [18]. Education of women has very much impact in increasing ANC services utilisation, by increasing awareness among women regarding available health services we can improve ANC utilisation. In rural area utilisation of ANC services were better as compared to urban area, this was mainly because in urban most of women were working and they had no enough time for ANC check-up. Similarly ANC utilisation was seen more in multigravida women as compared to primigravida, which may be because multigravida women had adequate awareness about ANC services and also they had enough experience of ANC care during previous pregnancy. On simple logistic regression, significant relation was found between utilisation of full ANC with age, residence area, education, socio-economic class and parity. Women with age ≥26 years, women from rural area, higher education, socio-economic class, and high parity were found to be more likely to get full ANC services. Chethana K et al., also found significant association of full ANC usage with education of women [17]. Lower maternal education correlated with suboptimal ANC utilisation. Though the comprehensive ANC utilisation was 69.2% in current study it need to improve and to achieve the goal of healthy mother and health baby it must be reach upto 100%.

Limitation(s)

The present study was hospital-based study in which pregnant females who came to tertiary care government hospital were included, pregnant female who attend private hospitals were not included hence the findings cannot be considered as true representation of the community. Further, recall bias was problem because there were questions regarding their pregnancy and ANC services utilisation. Lack of information regarding pregnancy with adverse outcome like abortion, miscarriage etc., cannot be commented on utilisation of ANC in pregnancies with adverse outcome.

CONCLUSION(S)

The present study reports that only 69.2% participants availed the full ANC services, but as compared to other studies done in the recent past, the service utilisation has improved. Although around one third of the participants did not receive full ANC services, utilisation of ANC services like early registration, four or more antenatal visit and TT immunisation was good. Women with higher age, rural area, higher education, socio-economic class, and high parity were found to be more likely to get full ANC services. This emphasises importance of female literacy and its positive effect on women and child health.

The study brings out the need for intensified and targeted awareness programs for pregnant women on the importance of antenatal visits and utilisation of various services. Immediate steps need to be taken to educate females about maternal and child health programmes and motivate them to utilise ANC services. Taking into consideration the factors that associated with low and inequitable utilisation, it is imperative to develop strategies to address the inadequacies and inequitable distribution of healthcare services, in order to achieve the World Health Organisation (WHO) recommendations at the earliest.

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PARTICULARS OF CONTRIBUTORS:
1. Associate Professor, Department of Community Medicine, Shantabaa Medical College, Amreli, Gujarat, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Nitin Lodha,
14, Jagdish Park Society Part 1, Behrampura, Ahmedabad-380022, Gujarat, India.
E-mail: nitinlodha17@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Jun 15, 2022
- Manual Googling: Jun 22, 2022
- iThenticate Software: Jul 05, 2022 (21%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **Jun 10, 2022**
Date of Peer Review: **Jun 20, 2022**
Date of Acceptance: **Jun 23, 2022**
Date of Publishing: **Aug 01, 2022**