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FACTORS AFFECTING UTILIZATION OF ANTENATAL SERVICES IN RURAL BENGALURU

Dr. Ananya Girish
Postgraduate,
Department of Obstetrics and Gynecology, Vinayaka Mission's Kirupananda Variyar Medical College & Hospitals, Vinayaka Mission's Research Foundation, VMRF (DU), Salem, Tamil Nadu, India
Email: anigirish24@gmail.com
Orchid id: https://orcid.org/0000-0003-4384-0651

Dr Rajiv Kumar Saxena.
Designation: Professor & HOD.
Institution: The Oxford Medical College, Hospital & Research Centre, Bengaluru.
Orchid ID: 0000-0003-3623-1241.

Dr. Akshay Ganeshkumar
Senior Resident, Department of Neurosurgery
AIIMS, Delhi

Dr. Sahana Girish
Fellow,Department of Fetal Medicine, Bangalore Fetal Medicine Centre.

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ABSTRACT

Background: Booking early for antenatal care (ANC) and regular follow-up provides opportunities that can significantly improve the health of the mother and her baby. The aim of this study was to determine the socio demographic factors influencing utilization of ANC services.
Methods: This prospective, cross sectional study of 100 women, was conducted at MVJ Medical College in Rural Bengaluru, Karnataka. Women who were referred from a peripheral medical facility (MF) for pregnancy related complication, in their third trimester, or for neonatal care, were included in this study. A validated semi-structured questionnaire was administered during an interactive session with the participants.

Results: Younger age and education were strong determinants of 1st trimester ANC booking in our study. Parity and education were strong factors determining the total number of ANC contacts. The distance of MF from the place of residence was inversely related to the total number of ANC contacts (p=.03). Perception of the respondents, of the quality of services provided in their nearest MF was a statistically significant determinant of the timing of 1st ANC contact and the total number of ANC contacts. Early registration of ANC resulted in statistically lower perinatal morbidity and mortality. Less ANC contacts were associated with increased perinatal morbidity and mortality.
Conclusion: MF located at a distance of more than 5 km from the place of residence and the negative perception of the pregnant women, regarding the services offered at the medical facility are important barriers to utilization of ANC.

INTRODUCTION:

Antenatal care (ANC) is the care given to pregnant women which is used widely for the prevention, early diagnosis, and treatment of pregnancy related conditions [1].

Early ANC booking and regular follow-up provide opportunities for early recognition of modifiable medical health states. When a woman initiates ANC late in pregnancy or does not avail ANC at all, she becomes a victim of missed opportunities and this could potentially result in poor reproductive outcome [2, 3]. The goals of comprehensive ANC cannot be achieved unless we can address the common problems of low ANC coverage, late booking and fewer contacts during pregnancy, especially in resource-limited settings.

The aim of this study was to determine the socio demographic factors influencing utilization of ANC services, and to assess the perception of the women regarding the quality of services provided in their nearest medical facility (MF). It is based upon the experiences of women who were referred to a tertiary care hospital, located in rural Bengaluru, for pregnancy related complication in late pregnancy.

MATERIAL AND METHODS:

This prospective, cross sectional study of 100 women, was conducted at MVJ Medical College and Research Hospital, Hoskote, Rural Bengaluru, Karnataka. Pregnant women who were referred from a peripheral MF to our hospital for the management of pregnancy related complication, in their third trimester, or postnatal women who had delivered in a nearby government or private hospital, then referred to our hospital for management of intranatal complication or NICU care for the neonate, were included in the study. A validated semi-structured questionnaire was administered during an interactive session with the participants.

Sample size was calculated assuming the proportion of 'Less than 4 ANC contacts' as 29% as per the NFHS-4 Data.[5] The other parameters considered for sample size calculation were 6% absolute precision and 80% confidence level.

RESULTS:

The socio-demographic profile of the participants, such as their age, education, parity and income was tabulated along with their first ANC contact in Table1. Two multigravida who did not attend ANC were excluded from this table. Total number of ANC contacts in their MF was noted in Table2. 18 participants who had attended regular ANC, but did not mention the total number of contacts in the questionnaire were excluded from table.

Details regarding the type of MF, its location, and the facilities provided in MF were recorded in Table3. The time taken and the expenditure incurred by the participants was directly related to the distance to MF. The time taken to reach the MF varied from 15 minutes to one hour, one way, and out of pocket expenditure for the participants varied from Rs 50 to Rs 500 for each contact. The perception of the women regarding the quality of services provided in the MF was noted as 'adequate' or 'inadequate'.

Table 4 gives an insight into the referral process from periphery to our hospital. 30% of participants were referred because staff was not available at the MF at the time of referral. Reasons for not utilizing the health services in the hospital, earlier in pregnancy, was also recorded.

The quality of services offered in the MF greatly influenced the perception of the parturient (Table5). Participants considered the services in MF as 'adequate' if they were seen by a doctor, there blood pressure recorded, blood tests done and if they received iron tablets from their MF.

Morbidity and mortality details were tabulated in Table6. In this study there was no maternal mortality recorded, due to the selection bias of the methodology. The study questionnaire was administered only after the participant recovered from the acute complication for which she was referred to the hospital. Maternal morbidity included cesarean delivery (n=54), postpartum haemorrhage (n=11), induced labour (n=6), assisted vaginal delivery (n=4) and two each for eclampsia, preterm labour, severe anaemia and ICU admissions (for jaundice and pulmonary oedema). The perinatal morbidity was categorised as no morbidity (n=53) or NICU admission (n=47). The perinatal mortality (n=10) included one case of anencephaly and two cases of intrauterine foetal death (one due to eclampsia and the other due to abruptio placenta). Some participants had more than one morbidity.

More number of ANC contacts resulted in lesser maternal morbidity. Early booking and more number of ANC contacts was statistically related to better perinatal outcome, as was the shorter distance to MF.

DISCUSSION

This study was a hospital based study to explore the factors that facilitate or prevent the pregnant women from availing comprehensive antenatal care in rural Bengaluru.

1st Antenatal Contact

In 2016, World Health Organization (WHO) changed their recommendation for ANC model to comprise of at least eight ANC contacts, with the first ANC contact before 12 weeks of gestation [4].

In our study 89% women started their ANC contacts in 1st trimester and only 9% of the respondents had their first ANC contact after 12 weeks of gestation. This would imply that women in rural Bangaluru are well aware of the benefits of early ANC booking. Most women (n=7) who reported late for their 1st ANC contact were not aware of their pregnancy till 2nd trimester. Others mentioned long distance to the MF as a barrier to early ANC contact.

The National Family Health Survey (NFHS)-4 (2015-16) data would suggest that in India, only 59% of women have their first ANC contact during the first trimester. In Karnataka state this figure was 65.9% [5].

A number of factors like age, education, income and parity affect the utilization of ANC services among pregnant women (Table1).

Age of the patient is a significant factor in determining the timing of their 1st ANC contact. The younger age women were more likely to come to hospital for early registration in 1st trimester, mainly to confirm their pregnancy. Similar findings were reported from Bihar, Chhattisgarh and Odisha where 63% of pregnant adolescents registered their pregnancy in the first trimester, as compared to only 51% of adult pregnant women reporting for first ANC contact in first trimester [6]. In our study all 10 participants (100%) below the age of 21 years, and 93.8% (n=45) of women aged between 21 and 25 years had registered during their 1st trimester of pregnancy. Whereas this figure was only 85% (n = 34) for women more than 25 years of age.

Educated women tend to come to the hospital early for ANC contact. In this study, the younger participants were better educated than the elders. 90% women, aged < 21 years had completed their primary schooling, whereas, only 81% of elders had completed their primary schooling. Similar findings were also reported by Fulpagare, and Tariku [6,7]. The two women who did not attend any ANC during the pregnancy had not received any formal education.

Rana, Shekhawat and Verma in their study mention that women who did not attend ANC were either not aware of benefits of ANC or felt there was no need to go for ANC contacts during their pregnancy [8-10]. Formal education of the girl child about the benefits of ANC and early booking, starting with primary school textbooks, will improve the overall utilization of ANC services in the country. Educationists and experts could create age sensitive content for school children e.g. children could be sensitized to food items rich in iron and calcium, importance of balanced diet, personal hygiene, daily exercise and necessity of regular health check-ups. In senior classes children could be sensitised to the importance of looking after pregnant women and immunization, harmful effects of traditional practice of home delivery, putting ‘kajal’ for new-born, top feeds for neonates with feeding bottles etc.

Parity was not a determinant of 1st ANC booking in our study. Tariku also reported that past utilization of antenatal care service was not a predictor of timely booking in subsequent pregnancy [7].

The household income was not related to early registration of ANC, in our study. This was in contrast to studies which reported that the booking in the first trimester was highest among adolescents with higher income [11]. Similarly, the distance of MF from the place of residence was not a determinant for the early booking of ANC. As mentioned earlier, most women went for their first contact to confirm their pregnancy.

In our study, the figure of 89% women starting ANC in 1st trimester, is significantly higher than the

figures mentioned in other studies. This gap can be partially explained by the differences in the study population which was women who were referred to our tertiary care hospital, located in rural Bengaluru, for pregnancy related complications.

Number of ANC Contacts:

Earlier WHO recommended minimum four ANC visits. Thereafter some large studies revealed that more number of ANC contacts were associated with lower perinatal mortality and higher maternal satisfaction. Hence, the revised 2016 WHO ANC model now recommends at least eight ANC contacts for the pregnant women. Furthermore, no differences was noted in maternal or perinatal outcomes between ANC models that included at least eight contacts and ANC models that included more than 8 contacts [4].

In our study, 25.6% (n=21) of the respondents had less than 4 ANC contacts. This included the 2.4% (n=2) who did not attend any ANC at all. The rest 74.4% (n=61) women in this study had 4 or more ANC contacts, of these 20.7% (n=17) had 8 or more ANC contacts.

The NFHS-4 data indicates that in India, 16.6% pregnant women had no ANC contacts, 31.7% women had less than four ANC contacts and about half (51%) had four or more ANC contacts during their last pregnancy. Urban women were more likely to have four or more ANC contacts compared to rural women (66% and 45%, respectively). In Karnataka 70% pregnant women recorded 4 or more ANC contacts [5,12].

Higher educational status of our participants was positively related to the total number of ANC contacts. NFHS-4 data also suggests that the number of ANC contacts improved with improving educational status of the women [3]. Mumbare et al, reported that not only the educational status of the women, but also the educational status of their spouses was significantly associated with ANC services utilization [13]. The parity of the women, though not related to 1st ANC contact, was significantly related to the total number of ANC contacts. In our study, primigravida had many more ANC contacts compared to multigravida. This is in contrast to the study of NFHS-4 data by Kumar et al which suggests that higher birth order was associated with lower odds of full ANC utilisation [11]. Probably the multigravida view pregnancy as a natural process, and ANC is still considered to be a curative service, that is to be sought only when problems arise [14]. This misconceptions about antenatal care needs to be corrected urgently by directed health education programs.

The household income was not a factor in determining the number of ANC contacts in this study (p = .31). This is in contrast to the study of NFHS-4 data by Kumar et al, Rana et al and Ogbo et al, which would suggest that women in lower wealth quintile(s), were unlikely to utilize the full ANC services [3, 8, 11].

The distance of medical facility from the place of residence was definitely a determinant for the total number of ANC contacts, as it involves time and money. A distance of more than 5 km was a deterrent to ANC contacts. 20% of the participants reported that they experienced delay/ difficulty in arranging transport at the time of referral. 11% also mentioned the challenges related to arranging transport for routine care. Some of the problems mentioned by the mothers was difficulty in undertaking the long journey, the non-availability and high cost of hiring of private vehicles for transportation, which was a barrier to the frequent ANC check-ups.

Choulagai B et al concluded from their study that <30 min distance to the nearest health facility was positively associated with higher coverage of ANC contact. The main reasons that women did not seek medical services included distance to a health facility (45%) and inadequate transportation (21%) [15].

Perception of quality of services in MF:

The perception of the respondents, of the quality of services provided at their nearest MF was an important determinant of the timing of 1st ANC contact and the total number of ANC contacts. In our study only 67% respondents felt that ANC care was adequate. Women who perceived the quality of services as 'adequate' were significantly more likely to avail the benefits of ANC services early in pregnancy and more frequently throughout their pregnancy (Table 5). That leaves 1/3rd (33%) of our population unsatisfied with ANC care for various reasons. Inadequate ANC care was a significant barrier to utilisation of ANC services.

Most women in rural areas seek care in government facility due to its availability, accessibility and affordability [16]. In our study, 50% of the women reported that their nearest medical facility was a small

government hospital, 28% went to private clinics while the rest had access to primary health centres (PHCs) or Sub-Centers (Table 3).

The perception of these women was largely based on the services offered to them during their visits to the MF. The participants were queried if they had received the basic ANC services, as prescribed by the government, during most of their ANC contacts. As evident from Table 3, 12% of respondents were not seen by the doctor, blood pressure was not recorded for 6% of women and 24% of women did not have a physical examination during ANC. 12% pregnant women did not receive IFA tablets and 14% did not have basic blood tests done during their ANC. The role of auxillary nurse midwife (ANM) or accredited social health activist (ASHA) health workers in providing home based care was miniscule. These deficiency in services significantly contributed to the perception of poor quality of care offered by the MF.

30% of our respondents were not aware of the limitations of their MF with respect to services not being available at night and their inability to manage more complicated cases, hence, they had to be referred to a tertiary care centre in an emergency.

NFHS-4 data for India and for Karnataka state also highlights these deficiencies of services during ANC [12].

If the quality of ANC is poor and the womens' experience of it is negative, evidence shows that women will not attend ANC, irrespective of any recommendation [1]. Unavailability of medicines and health care providers at MF, contributes a major share of 'out of pocket' expenses for the patient. Addressing these concerns by periodic training of staff, monitoring and audit of the quality of services offered in rural areas will go a long way in improving the perception of their clientele and thereby improve the ANC services utilization, and promote a positive pregnancy experience.

Maternal and perinatal outcome

The importance of ANC in improving maternal and perinatal outcomes is well established. In our study all the maternal outcomes were considered as a group i.e. 'No Morbidity' and 'Morbidity present'. The maternal morbidity was significantly associated with the total number of ANC contacts, i.e. as the number of ANC contacts increased, the maternal morbidity was significantly lowered.

The perinatal mortality and morbidity was significantly associated with the total number of ANC contacts, that is, less ANC contacts were associated with increased perinatal morbidity and mortality. Early registration of ANC resulted in statistically lower perinatal morbidity and mortality.

Another important factor influencing perinatal outcome was the distance to MF. As the distance to MF increased, the number of perinatal morbidity and mortality also increased.

LIMITATIONS OF THE STUDY

This is a an institution based cross-sectional study, hence, the findings cannot be generalized. Most of the participants were women who were referred to the hospital for the first time, due to an adverse pregnancy event. Hence, the women with normal pregnancy outcome, who were not referred to the hospital, were not represented in this study.

CONCLUSION:

MF located at a distance of more than 5 km from the place of residence and the negative perception of the pregnant women, regarding the services offered at the medical facility are important barriers to utilization of ANC. Educating the women regarding the benefits of ANC and improving the quality of ANC services will improve the overall utilization of ANC services in rural Bengaluru.

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Table 1. SOCIO-DEMOGRAPHIC PROFILE AND FIRST ANC CONTACT					
	Within 8 wks	9-12 weeks	>12 weeks	Total	
A. Age*					
< 21	5	5	0	10	
21-25	23	22	3	48	
26-30	21	7	6	34	$p = .04$
>30	1	5	0	6	
Total	50	39	9	98*	
B. Education*					
No Formal Education	0	0	0	0	
Less than 10th std	4	10	3	17	
Completed 10th std	27	21	6	54	$p = .03$
Completed 12th std	15	8	0	23	
Degree courses	4	0	0	4	
Total	50	39	9	98*	
C. Parity*					
Primigravida	28	17	4	49	
Multigravida	22	22	5	49	$p = .47$
Total	50	39	9	98*	
D. Income (Rs)*					
< 5000	0	4	0	4	
5001 - 10000	20	11	2	33	
10001 – 15000	19	11	3	33	
15001 – 20000	10	11	4	25	$p = .23$
> 20000	1	2	0	3	
Total	50	39	9	98*	
E. Distance from MF*					
Upto 1 km	9	7	5	21	
>1 - 5 km	32	25	3	60	
>5 – 10 km	7	4	1	12	$p = .31$
>10 km	2	3	0	5	
Total	50	39	9	98*	
* 2 multi gravidas did not attend any ANC, hence not included.					

Table 2. SOCIO-DEMOGRAPHIC PROFILE AND TOTAL ANC CONTACTS					
	< 4 ANC contacts	4 – 7 ANC contacts	≥ 8 ANC contacts	Total	
A. Age*					
< 21	2	5	2	9	
21-25	12	19	8	39	
26-30	6	14	7	27	$p = .74$
>30	1	5	0	6	
Total	21	44	17	82*	
B. Education*					
No Formal Education	2	0	0	0	
Less than 10th std	4	5	3	12	
Completed 10th std	11	26	7	44	$p = .02$
Completed 12th std	1	12	8	21	
Degree courses	0	1	2	3	
Total	21	44	17	82*	
C. Parity*					
Primigravida	6	14	17	37	
Multigravida	12	30	3	45	$p = .001$
Total	16	44	20	82*	
D. Income (Rs)*					
< 5000	1	3	0	4	
5001 - 10000	7	17	4	28	
10001 – 15000	4	12	9	25	$p = .31$
15001 – 20000	5	12	5	22	
> 20000	1	0	2	3	
Total	16	44	20	82*	
E. Distance from MF*					
Upto 1 km	5	7	6	18	
>1 - 5 km	7	32	12	51	
>5 – 10 km	4	2	2	8	$p = .03$
>10 km	2	3	0	5	
Total	11	44	20	82*	
*18 participants attended ANC, but did not mention the number of ANC visits.					

TABLE 3: DETAILS OF NEAREST MEDICAL FACILITY (MF)		
Group	Frequency	Percentage (%)
A. Type of nearest MF		
Small Govt Hospital	50	50
PHC	3	3
Sub centre	6	6
Private hospital with beds	28	28
Private clinic	11	11
Medical store	2	2
B. Distance to nearest MF		
< 2 km	22	22
2 – 5 km	61	61
5 – 10 km	13	13
> 10 km	4	4
C. Facilities available in the MF*		
Only laboratory	11	11
Laboratory and dispensary	5	5
Facility for delivery	84	84
D. Senior Staff available in MF		
Doctor	88	88
ANM / Nurse	12	12
E. Services received at the MF**		
Inj Tetanus Toxoid	93	93
Iron Tablets	88	88
Blood Tests	87	87
Blood Pressure Measurement	95	95
Obstetric Examination	84	84
Home visit by ANM / ASHA worker	14	14
Seen by doctor	91	91
F. Perception of services offered in MF		
Adequate	67	67
Inadequate	33	33
* 5% reported that the services were not available after 2200h. ** Only 12% of the women had received all the mentioned services.		

Table 4. REFERAL TO HOSPITAL		
	Frequency	Percentage (%)
A. Availability of staff at MF at time of referral		
Staff available in MF	70	70
Staff not available in MF	30	30
B. Mode of reaching the hospital		
Private transport	34	34
Public transport (Bus)	19	19
108 Ambulance service	23	23
Auto or taxi services	24	24
C. Timing of referral to hospital		
Antenatal period (for pregnancy complication)	46	46
Intranatal period (for dystocia or foetal distress)	49	49
Postnatal period (after delivery for care of neonate)	5	5
D. Time taken to reach the hospital*		
Upto 30 minutes	73	73
30 minutes to one hour	22	22
More than one hour	5	5
E. Reason for not utilizing the health services in the hospital earlier		
Not aware of the limitations of the medical facility	15	15
Long distance/ lack of adequate travel facilities	11	11
Not aware of the seriousness warranted by her health condition	21	21
Lack of knowledge on the various benefits and facilities provided by tertiary care centre.	25	25
Monetary difficulties thereby choosing the closest and cheapest health facility.	15	15
Familiarity with the medical facility and scared of big hospitals	13	13
* 20% experienced problems in arranging for transport to the hospital		

Table 5. PERCEPTION OF SERVICES OFFERED BY MF				
	Adequate	Inadequate	Total	
A. 1st ANC visit (Only multigravidas)				
Within 8 weeks	19	3	22	$p < .05$
9-12 weeks	10	12	22	
>12 weeks	2	3	5	
Total	31	18	49*	
B. Total number of antenatal contacts				
<4 ANC contacts	6	12	16	$p < .001$
4-7 ANC contacts	14	30	44	
>7 ANC contacts	17	3	20	
Total	37	45	82**	
C. Maternal morbidity				
Nil	22	45	67	$p = .21$
Morbidity	45	18	33	
Mortality	0	0	0	
Total	47	10	100	
D. Perinatal morbidity and mortality				
Nil	37	6	43	$p < .001$
Morbidity	27	20	47	
Mortality	3	7	10	
Total	67	33	100	
E. Perception of quality of individual services offered in MF				
	Adequate (n=67)	Inadequate (n=33)	Total (n=100)	*Chi-Square or Fisher Exact Test*
Inj Tetanus toxoid	64	29	93	$p = .15$
Iron Tablets	62	26	88	$p = .04$
Blood tests	63	23	86	$p < .001$
Record Blood pressure	67	27	94	$p < .001$
Physical Examination	54	22	76	$p = .12$
Home visit by ANM / ASHA	6	7	13	$p = .08$
Seen by doctor	67	21	88	$p < .001$
* Calculated only for multigravida (Primigravida excluded)				

Table 6. MATERNAL & PERINATAL MORBIDITY & MORTALITY

	No Morbidity	Morbidity	Mortality	Total	
1) MATERNAL MORBIDITY & MORTALITY					
A. 1st ANC visit					
Within 8 weeks	19	31	0	50	$p = .95$
9-12 weeks	15	24	0	39	
>12 weeks	3	6	0	9	
Total	37	61	0	98*	
B. Total number of antenatal contacts					
<4 ANC contacts	11	10	0	21	$p = .03$
4-7 ANC contacts	12	32	0	44	
>7 ANC contacts	10	7	0	17	
Total	33	49	0	82**	
C. Distance to MF					
Upto 1 km	10	11	0	21	$p = .32$
>1 - 5 km	19	43	0	62	
>5 – 10 km	5	7	0	12	
>10 km	3	2	0	5	
Total	37	63	0	100	
2) PERINATAL MORBIDITY & MORTALITY					
D. 1st ANC visit					
Within 8 weeks	28	19	3	50	$p < .001$
9-12 weeks	13	25	1	39	
>12 weeks	2	3	4	9	
Total	43	47	8	98*	
E. Total number of antenatal contacts					
<4 ANC contacts	3	11	7	21	$p < .001$
4-7 ANC contacts	21	22	1	44	
>7 ANC contacts	11	6	0	17	
Total	35	39	8	82**	
F. Distance to MF					
Upto 1 km	13	5	3	21	$p = .05$
>1 - 5 km	27	29	6	62	
>5 – 10 km	3	8	1	12	
>10 km	0	5	0	5	
Total	43	47	10	100	

* 2 multigravidas did not attend any ANC, hence not included. (Both the neonates died in NICU)
**18 participants attended ANC, but did not mention the number of ANC visits