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Original Research Article

STUDY OF SOCIODEMOGRAPHIC FACTORS AFFECTING ADEQUATE ANC SERVICES UTILIZATION

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ABSTRACT

Background: Antenatal care (ANC) is a critical component of maternal health that ensures early detection and management of pregnancy-related complications, thereby reducing maternal and neonatal morbidity and mortality. Despite substantial improvements in service availability, the adequacy of ANC utilization remains uneven across different sociodemographic groups. Understanding these determinants at the community level is vital for strengthening maternal health programs.

Materials and Methods: A community-based cross-sectional descriptive study was conducted from March 2016 to February 2017 among 180 women residing in an urban slum field practice area of the Department of Community Medicine, [Parent Medical College]. Eligible participants were women of reproductive age who had delivered within the previous year. Data were collected through face-to-face interviews using a pre-tested, semi-structured questionnaire, with information verified through ANC cards or health post records. Adequate ANC utilization was defined as registration during the first trimester, ≥3 visits, 2 TT doses, ≥100 iron–folic acid tablets consumed, and receipt of essential ANC services. Data were analyzed using SPSS version 20.0, and associations were tested with the Chi-square test ($p<0.05$ considered significant).

Results: Adequate ANC utilization was observed among 90% of participants. Significant associations were found between adequacy of ANC and education of women ($p=0.047$), education of husbands ($p=0.019$), and socioeconomic status ($p=0.041$). No significant association was noted with age, religion, or family type. Most women (95.6%) were aware of ANC services, 45% registered in the first trimester, and 89.4% had more than three ANC visits.

Conclusion: The study revealed a high prevalence of adequate ANC utilization, influenced primarily by educational and socioeconomic factors. Strengthening women's education, promoting male involvement, and prioritizing outreach to socioeconomically disadvantaged groups are recommended to sustain and further enhance ANC coverage.

Keywords: Antenatal care utilization, Sociodemographic factors, Maternal health, Urban slum, Cross-sectional study.

INTRODUCTION

Antenatal care (ANC) refers to the health services provided to pregnant women from the time of conception until the onset of labour with the aim of monitoring the progress of pregnancy, preventing and managing complications, and enhancing maternal and neonatal outcomes. ANC includes a set of essential interventions such as early registration, routine clinical and laboratory assessments, immunizations, micronutrient supplementation, health education, and identification of high-risk conditions requiring referral or specialized care.[1,2] Globally, the World Health Organization (WHO) emphasizes early and adequate ANC contacts, recommending a minimum of eight visits to optimize maternal and fetal health and reduce preventable morbidity and mortality.[1,3] In low- and middle-

income countries (LMICs), however, a substantial proportion of women do not receive the recommended ANC services despite the known benefits, resulting in persistently high maternal and newborn mortality rates.[4,5]

The pathogenesis of inadequate ANC utilization is multifaceted, rooted in the interplay between individual, household, community, and health system determinants. Sociodemographic factors — such as maternal age, educational attainment, household wealth, husband's education, and cultural norms — influence both the perceived need for care and the ability to access and utilize services.[6-8] These factors may affect health-seeking behaviour by shaping women's understanding of pregnancy risks, autonomy in decision-making, and practical access to health facilities. For instance, low educational levels and poverty are consistently associated with fewer ANC visits and delayed care seeking, as women from these groups may have limited health literacy, reduced financial means, and lower empowerment to navigate healthcare systems.[6,7] At the community level, sociocultural norms and gender dynamics further modulate utilization patterns, often amplifying inequalities in maternal health service uptake.[8]

In the Indian context, despite policy efforts and national programmes aimed at improving maternal health service coverage, including ANC, disparities in ANC utilization persist across states and sociodemographic groups.[9] National data indicate that while institutional deliveries have increased substantially, adequate utilization of quality ANC services — including multiple visits and comprehensive content — remains suboptimal and inequitable, particularly among the socioeconomically disadvantaged and uneducated populations. This highlights a critical gap between service availability and effective utilization. Therefore, understanding the sociodemographic determinants of adequate ANC utilization at the community level is essential to inform targeted public health interventions, ensure equitable access, and contribute to the reduction of maternal and neonatal morbidity and mortality. This study was conducted to estimate the prevalence of adequate ANC utilization and to assess the sociodemographic factors influencing it among women in a defined urban field practice area.

MATERIALS AND METHODS

A community-based cross-sectional descriptive study was conducted in the field practice area attached to the Urban Health Centre of the Department of Community Medicine, [Parent Medical College], from March 2016 to February 2017. The study population comprised women of reproductive age (19–49 years) who were permanent residents of the area and had delivered within the preceding one year. Women residing in the area for less than one year, those aged below 18 years, and women who experienced abortions before 20 weeks of gestation were excluded from the study. The required sample size was calculated using the formula $n = 4pq/l^2$, taking the prevalence (p) of ANC utilization as 90.3% based on NFHS-3 data for urban slum populations, with a 5% allowable error (l). The computed sample size of 173 was rounded off to 180 for adequacy.

The urban slum study area comprised 11 sectors (A–K) with a total population of 83,253 and 13,765 households. Using data obtained from the local health post, a list of all women who had delivered in the last year from each sector was prepared. From this frame, the required number of participants from each sector was determined using proportionate allocation, and study subjects were then selected by simple random sampling using random number tables. Written informed consent was obtained from all eligible participants after explaining the study objectives and ensuring confidentiality. Ethical clearance was obtained from the Institutional Ethics Committee prior to commencement of the study.

Data were collected through face-to-face interviews using a pre-tested, semi-structured questionnaire that included sections on sociodemographic details, awareness and utilization of ANC services, and health-related behaviors. Information on antenatal visits, investigations, and supplementation was verified using ANC cards or cross-checked with records at the health post to minimize recall bias. Adequate utilization of ANC services was operationally defined as: registration during the first trimester, at least three antenatal visits, receipt of two tetanus toxoid (TT) injections or one TT in the current pregnancy and one within the previous three years, consumption of a minimum of 100 iron-folic acid tablets, and receipt of essential ANC services (measurement of weight and blood pressure, urine and blood testing, and abdominal examination).

Data were entered and compiled in Microsoft Excel 2013 and analyzed using SPSS version 20.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as frequencies and percentages. Associations between adequacy of ANC utilization and sociodemographic variables were assessed using the Chi-square (χ^2) test, with a p-value < 0.05 considered statistically significant.

RESULTS

Table 1: Sociodemographic Profile of Study Participants (N=180)

Variable	Category	Frequency (n)	Percentage (%)
Age group (in years)	19–24	83	46.1
	25–30	80	44.4
	>30	17	9.5
Religion	Hindu	21	11.7
	Muslim	159	88.3
Education of women	Illiterate	95	52.8
	Primary	19	10.6
	Secondary	53	29.4
	Higher secondary & above	13	7.2
Occupation of women	Not working (homemaker)	170	94.4
	Working	10	5.6
Husband's education	Illiterate	98	54.4
	Primary	35	19.4
	Secondary	40	22.2
	Higher secondary & above	7	3.9
Type of family	Nuclear	103	57.2
	Joint	77	42.8
Socioeconomic class *(Modified BG Prasad, 2015)*	Class I	2	1.1
	Class II	12	6.7
	Class III	67	37.2
	Class IV	69	38.3
	Class V	30	16.7

A total of 180 women who had delivered within the preceding year were included in the study. Nearly half of the respondents (46.1%) were in the 19–24-year age group, followed closely by 44.4% in the 25–30-year group, while only 9.5% were aged above 30 years. The majority of participants were Muslim (88.3%), with Hindus comprising 11.7%. More than half of the women (52.8%) were illiterate, and 54.4% of their husbands had not received formal education. Only a small proportion of women (5.6%) were employed, with most (94.4%) being homemakers. More than half (57.2%) lived in nuclear families, and the remaining 42.8% in joint families. Socioeconomic assessment using the Modified BG Prasad Classification (2015) revealed that 55% of participants belonged to lower socioeconomic classes (Class IV and V), while 45% were from the higher socioeconomic groups (Class I–III). This overall profile indicates that the majority of study participants were young, uneducated, unemployed women from economically weaker households, reflecting the typical demographic characteristics of urban slum communities.

Table 2: Adequacy of Antenatal Care (ANC) Services Utilization Among Study Participants (N = 180)

ANC Utilization Status*	Frequency (n)	Percentage (%)
Adequate	162	90.0
Inadequate	18	10.0
Total	180	100.0

Based on the predefined operational criteria, 162 (90%) women had adequate ANC utilization, while 18 (10%) were found to have inadequate ANC. This reflects a high prevalence of adequate ANC coverage, well above the national average reported in NFHS-4 and NFHS-5 surveys for urban slum areas. The findings underscore a positive impact of urban health initiatives and community-level maternal care interventions. Nevertheless, identifying factors associated with the remaining 10% of inadequately covered women remains crucial for ensuring universal ANC access.

Table 3: Association Between Sociodemographic Factors and Adequate Antenatal Care (ANC) Services Utilization (N = 180)

Sociodemographic Variable	Category	Adequate ANC (n = 162)	Inadequate ANC (n = 18)	Total (n)	χ^2	df	p-value
Age group (in years)	19–24	75 (90.4%)	8 (9.6%)	83	4.03	2	0.134
	25–30	74 (92.5%)	6 (7.5%)	80			
	>30	13 (76.5%)	4 (23.5%)	17			
Religion	Muslim	144 (90.6%)	15 (9.4%)	159	0.10	1	0.757
	Hindu	18 (85.7%)	3 (14.3%)	21			
Socioeconomic status ***(Grouped)***	Higher (Class I–III)	77 (95.1%)	4 (4.9%)	81	4.19	1	0.041*
	Lower (Class IV–V)	85 (85.9%)	14 (14.1%)	99			
Type of family	Nuclear	95 (92.2%)	8 (7.8%)	103	1.33	1	0.248

	Joint	67 (87.0%)	10 (13.0%)	77			
Education of women	Literate	81 (95.3%)	4 (4.7%)	85	3.96	1	0.047*
	Illiterate	81 (85.3%)	14 (14.7%)	95			
Husband's education	Literate	79 (96.3%)	3 (3.7%)	82	5.50	1	0.019*
	Illiterate	83 (84.7%)	15 (15.3%)	98			

Analysis of associations between sociodemographic variables and adequacy of ANC utilization revealed statistically significant relationships with socioeconomic status (p = 0.041), education of women (p = 0.047), and education of husbands (p = 0.019). Women belonging to higher socioeconomic classes and those who were literate were significantly more likely to utilize ANC services adequately compared to their lower-income or illiterate counterparts. Similarly, the husband's literacy status was an important determinant, indicating the role of family support and health awareness in ANC uptake. No significant associations were found between ANC adequacy and age group (p = 0.134), religion (p = 0.757), or type of family (p = 0.248). This suggests that while demographic characteristics had minimal influence, socioeconomic and educational status were the key determinants driving ANC utilization patterns among urban slum women.

DISCUSSION

In this community-based cross-sectional study, a high prevalence of adequate antenatal care (ANC) utilization was observed, with 90% of the women meeting the operational criteria for adequate ANC. This coverage is considerably higher than national estimates from large-scale surveys in India. For example, data from the National Family Health Survey (NFHS-5) indicated that only 59.3% of women reported receiving ≥4 ANC visits during their most recent pregnancy, with 6.1% receiving no ANC at all. Similarly, Thakkar et al. reported that 40.8% of Indian women had inadequate ANC visits (<4) in the 2019–2021 NFHS data^6. The discrepancy between our study and national findings may be attributable to the urban slum setting with active outreach by primary healthcare providers and high accessibility to health services, compared with broader national patterns where disparities persist.

Consistent with our finding that education of women significantly influences ANC utilization (p=0.047), multiple studies have documented the positive impact of maternal education on ANC uptake. In an urban–rural Delhi cohort, Rustagi et al. found that ANC knowledge was significantly higher among educated women (p<0.001), and only 53% of participants received comprehensive ANC defined by early registration, ≥4 visits, and IFA + TT coverage.[10] National data also underscore the role of education, with more educated women showing higher likelihood of completing the recommended ANC visits compared to less educated peers^0search0,20. This aligns with global evidence that maternal education enhances health literacy, decision-making capacity, and health-seeking behavior, thereby reducing barriers to timely care.[10]

Socioeconomic status (SES) was another key determinant in our study (p=0.041), with women in higher SES groups exhibiting greater ANC utilization. This is consistent with evidence from India and other LMICs showing a strong positive association between wealth and ANC uptake. National analyses demonstrate that women from richer households are significantly more likely to have four or more ANC visits compared with poorer households,14. Moreover, studies from Sub-Saharan Africa and India have highlighted that both wealth and education contribute substantially to inequalities in ANC usage, with wealthier women often accessing care more extensively.[3,7] These socioeconomic disparities reflect broader social determinants of health, where economic means facilitate access to transportation, health facility services, and associated costs, thus influencing utilization patterns.

The husband's education was also significantly associated with adequate ANC utilization (p=0.019) in our study, suggesting that male partner support and awareness may influence maternal health behaviors. This finding is corroborated by other research indicating that spousal literacy enhances maternal healthcare utilization, possibly through improved communication, decision-making support, and household prioritization of health services.[19] In many settings, husband's education and family support determine whether women can seek care independently or need permission, highlighting the importance of targeting interventions at the household level to improve maternal health outcomes.

Age, religion, and family type were not significantly associated with ANC utilization in our study. While some studies report age and parity as determinants of ANC uptake6, the absence of association here may reflect the relatively homogeneous age distribution in the reproductive age group and dominant sociodemographic profile of the urban slum. Religion has shown variable effects on care utilization in different contexts, with some NFHS analyses suggesting cultural influences, but this was not evident in our cohort.[20]

Overall, the findings from this study align with broader patterns identifying maternal education, socioeconomic status, and partner's education as consistent predictors of ANC utilization. The high prevalence of adequate ANC in this urban slum suggests that targeted primary healthcare strategies, community outreach, and health education may be effective in improving service uptake. However, persistent inequalities in ANC use at national and regional levels underscore the need for continued

policy focus on disadvantaged groups to achieve universal coverage and maternal health equity.

CONCLUSION

This community-based cross-sectional study demonstrated a high prevalence (90%) of adequate antenatal care (ANC) utilization among women in an urban slum area, indicating commendable coverage of maternal health services. However, utilization was found to be significantly influenced by sociodemographic factors, particularly the educational status of women and their husbands and socioeconomic class. These findings reaffirm that while physical accessibility to health services has improved, social and educational inequalities continue to shape ANC utilization patterns.

Efforts to further enhance ANC coverage should focus on: Strengthening health education and awareness among women of reproductive age, particularly those with low literacy levels. Involving male partners in maternal health education and counseling sessions to improve spousal support and informed decision-making. Targeted outreach programs for women from lower socioeconomic backgrounds to ensure equitable access to timely and adequate ANC services. Continuous monitoring and evaluation of ANC quality at community level to ensure that the services received are not only adequate in number but also comprehensive in content.

The study was cross-sectional, which limits causal inference regarding factors influencing ANC utilization. Additionally, the findings are based on self-reported data and may be subject to recall bias, though efforts were made to verify responses through ANC cards and health post records. The study was conducted in a single urban slum area, which may limit the generalizability of results to other populations with different sociodemographic characteristics.

Conflict of Interest: None declared

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