Original Research

A STUDY ON UTILIZATION OF ANTENATAL CARE SERVICES IN THE URBAN SLUMS OF BHOPAL, MADHYA PRADESH

Dr. Sumit Shrivastava[1]*, Dr. Prabhakar Hiwarkar[2], Dr. Garima Namdev[3]
[1*]Postgraduate 3rd Year, Department of Community Medicine, Chirayu Medical College and Hospital, Bhopal, Madhya Pradesh.
[2]Dean and Professor, Department of Community Medicine, Chirayu Medical College and Hospital, Bhopal, Madhya Pradesh.
[3]Professor and Head, Department of Community Medicine, Chirayu Medical College and Hospital, Bhopal, Madhya Pradesh.
Corresponding Author: Dr. Sumit Shrivastava
Postgraduate 3rd Year, Department of Community Medicine, Chirayu Medical College and Hospital, Bhopal, Madhya Pradesh.
Email: drsumitshrivastava@gmail.com

ABSTRACT

Background: Despite national gains in antenatal care (ANC) coverage, women in urban slums remain vulnerable to gaps in service utilization and quality. Slum-specific evidence from Bhopal has been scarce. This study assessed ANC utilization, its pattern, associated factors, and reasons for non-use among women in Bhopal's urban slums.

Methods: A community-based cross-sectional study was conducted over three months. A total of 410 married women aged 20 years and above who had delivered their last child within the previous one year and residing in the selected slums were interviewed. A structured, pre-tested questionnaire captured socio-demographic details, ANC visits, timing, and place of care, iron-folic acid (IFA) intake, Tetanus and Diphtheria (TD) immunisation, and barriers. Data were analysed using SPSS 20.0, with chi-square tests for associations.

Results: Almost all women (96.3%) had at least one ANC check-up; 63.5% made four or more visits and 74.2% booked in the first trimester. Government facilities were the main source of care (60.3%). IFA consumption for the recommended 100 or more days was only 44.4%, with forgetfulness and side effects as leading reasons. TT coverage was substantially higher (85.6% with two doses or booster). Maternal education was the sole factor significantly associated with adequate ANC (71% among women with secondary or higher education vs. 51% among those with less education; $p<0.001$). Among the 15 women who did not attend any ANC, lack of transport (40%) and lack of knowledge or perception that care was unnecessary (26.7% each) were the primary barriers.

Conclusion: While ANC contact coverage in Bhopal's slums now approaches national averages, the quality and continuity of care—particularly IFA supplementation—remain deficient. Maternal education is the strongest predictor of adequate utilisation. Efforts must shift from achieving first contact to ensuring each visit is informative and supportive, with targeted outreach to overcome transport and awareness gaps among the least educated.

INTRODUCTION

Pregnancy and childbirth are natural events, but they still carry risks—especially for women who cannot easily reach good healthcare.[1] Antenatal care (ANC) is one of the most basic and effective ways to protect both the mother and the baby.[2] It helps catch problems early, prevents complications, and keeps the mother healthy throughout pregnancy.[1]

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Over time, global understanding of what makes ANC effective has grown. In 2016, the World Health Organization updated its guidelines and began recommending at least eight antenatal contacts during pregnancy, moving beyond the older target of four visits. This change emphasized that care should be continuous, start early, and include quality counseling, not just a quick check-up.[1] India has worked hard to improve maternal health through programs like the National Health Mission.[3] The National Family Health Survey-5 (2019–21) showed that 92.6% of mothers received at least one antenatal check-up, 58.5% completed four or more visits, and 70.0% registered in the first three months of pregnancy. The latest NFHS-6 (2023–24), released in May 2026, brought even better news: coverage rose to 95.9%, four-or-more visits climbed

to 65.2%, and first-trimester registration reached 76.2%. These all-India numbers tell a story of steady improvement.[24] Yet, behind these national averages, there are stubborn gaps. Maternal deaths have not fallen evenly. The Sample Registration System (2020–22) reported India's maternal mortality ratio as 87 per 100,000 live births, but in Madhya Pradesh the figure was much higher—159 per 100,000 live births. This means that in states like Madhya Pradesh, the journey to safe motherhood is still difficult for many women.[2] within these states; the poorest city-dwellers carry a double burden. Nearly one-third of India's urban population lives in slums—overcrowded areas with poor sanitation, unsafe water, and limited space.[5]

On paper, urban health indicators look better than rural ones, but averages hide the deep inequality inside cities. Women in urban slums often use health services like antenatal care far less than the city-wide numbers suggest.[7] Researchers have studied ANC use in slums across different Indian cities over the past decade. Early studies from places like Aligarh found that barely half of the women had even one check-up.[8]

Later studies from Lucknow, Amritsar, and Ahmedabad showed improvement, but many women still did not complete the full schedule of visits, and the use of iron-folic acid tablets remained very low.[9,10,15] These studies made it clear that while simply getting women to attend once was becoming easier, ensuring early, continuous, and quality care was still a major challenge.[9]

In Bhopal, however, there has been very little recent information that focuses specifically on its urban slum population. This study was therefore planned to fill that gap .It set out to assess how women living in Bhopal's urban slums actually use antenatal care services, what personal and family factors shape their choices, and why some women still do not receive care at all.[6]

Aims and objectives

The aim of this study was to assess how women in Bhopal's urban slums used antenatal care (ANC) services and to identify the factors that influenced their use.

The objectives were to determine the proportion of women who utilized ANC services at least once during their last pregnancy; to describe the detailed pattern of ANC utilization, including the number of visits made, the timing of the first visit, the number of iron-folic acid (IFA) tablets consumed, and tetanus and diphtheria (TD) immunisation status; to identify the socio-demographic factors associated with adequate ANC utilization; and to explore the reasons given by women who either did not use ANC services at all or who used them incompletely.

METHODOLOGY

The present study was carried out as a community-based cross-sectional study over a period of three months in the urban slums of Bhopal.

The sample size was calculated using the formula $n = Z^2pq/d^2$, taking the proportion of women who attended four or more ANC visits as 59% (based on NFHS-5 data) [13], with an allowable error of 5% and a 95% confidence interval. This gave a minimum sample of 372, which was increased to 410 after adding 10% to account for possible non-response. Married women above 20 years of age who had delivered their most recent child in the past year, were residents of the selected slum area, and willingly gave consent were included. Women who could not be found at home even after three visits and those who were seriously ill or hospitalized were excluded.

Data were collected through face-to-face interviews using a structured, pre-tested questionnaire. All data were first entered into Microsoft Excel and then analysed using SPSS version 20.0. Ethical clearance was obtained from the Institutional Ethics Committee of Chirayu Medical College, Bhopal [CMCH/IEC2026/MAY/44], and informed written consent was taken from every participant before the interview.

RESULTS

Out of 410 women nearly half (48.0%) were in the 25–29 year age group, and another 25% were aged 21–24 years. Hindus constitute (74.9%) of the sample, while Muslims were the next largest group (18.0%). In terms of social background, nearly half belonged to the Other Backward Classes (45.1%), followed by Scheduled Castes (25.1%) and Scheduled Tribes (8.5%). Over half the women lived in nuclear families (57.6%). The 48% women had studied up to middle school or less, and only 7.3% were graduates or postgraduates. On the modified Kuppuswamy scale, more than half the women fell into the lower socioeconomic classes—37.1% in upper-lower (Class IV) and 19.8% in lower (Class V).

Table 1. Pattern of Antenatal Care Utilization (N=410)

Variable	Category	Number (N)	Percent (%)
Attended Any ANC Check-Up	Yes	395	96.3
	No	15	3.7
Number Of ANC Visits	One	49	12.4

	Two	95	24.1
	Four Or More	251	63.5
Timing Of First ANC Visit	First Trimester	293	74.2
	Second Trimester	91	23
	Third Trimester	11	2.8
Place Of ANC Check-Up	Govt. Hospital/CHC/UPHC	238	60.3
	Private Clinic	117	29.6
	ANM/ASHA/Subcenter	29	7.3
	NGO/Charitable	2	0.5
	Others	9	2.3
Main ANC Provider	Doctor	276	69.9
	ANM/Nurse	94	23.8
	ASHA/CHW	25	6.3

Almost all women (96.3%) had at least one antenatal check-up. However, only 63.5% made four or more visits; 74.2% visited for a checkup in the first trimester itself. The maximum times women used government facilities and visited a doctor was the main provider for about 70 percent of them.

Table 2: Iron-Folic Acid (Ifa) and Tetanus Toxoid (Tt) Uptake, With Reasons for Shortfall

Variable	Category	Number (N)	Percent (%)
Ifa Consumption	Yes, ≥100 Days	182	44.4
	Yes, <100 Days	164	40
	No	64	15.6
Reason For Ifa <100 Days	Side Effects	60	36.6
	Bad Taste	19	11.6
	Forgot To Take	55	33.5
	Given Less By Worker	16	9.8
	Not Available	10	6.1
	Others	4	2.4
Reason For No Ifa At All	Did Not Feel Need	24	37.5
	Fear Of Effects	13	20.3
	Did Not Receive	18	28.1
	Others	9	14.1
Tetanus Toxoid Received	Two Doses/Booster	351	85.6
	One Dose Only	30	7.3
	None	29	7.1
Reason For Incomplete Tt	Didn't Know Importance	14	23.7
	Lack Of Time	23	39
	Fear Of Side Effects	9	15.3
	Not Available	10	16.9

	Others	3	5.1

The weakest part of ANC was IFA consumption. Less than half of the women (44.4%) took iron-folic acid tablets for the recommended 100 days or more. The two main reasons were forgetfulness and side effects. Tetanus toxoid coverage was much better, with 85.6% receiving both doses or a booster. Among those who missed TT, lack of time and not understanding its importance were the leading reasons.

Table 3: Association between Socio-Demographic Factors and Adequate Anc (Four Or More Visits)

Factor	Category	Adequate Anc N (%)	Inadequate N (%)	X^2	P-Value
Maternal Age	<30 Years	184 (61%)	117 (39%)	0	1
	≥30 Years	67 (61%)	42 (39%)		
Maternal Education	Secondary & Above	151 (71%)	62 (29%)	16.63	0.000*
	Up To Middle	100 (51%)	97 (49%)		
Socioeconomic Status	Lower (Iv–V)	134 (58%)	99 (42%)	2.78	0.096
	Upper/Middle (I–Iii)	117 (66%)	60 (34%)		
Type Of Family	Joint / Three Generation	101 (58%)	73 (42%)	1.06	0.303
	Nuclear	150 (64%)	86 (36%)		
Religion	Hindu	187 (61%)	120 (39%)	0.01	0.917
	Non-Hindu	64 (62%)	39 (38%)		
Birth Order	1–2	234 (62%)	145 (38%)	0.32	0.571
	≥3	17 (55%)	14 (45%)		

*$p < 0.05$ considered statistically significant

Among all the factors studied, only maternal education showed a strong, statistically significant link with adequate ANC. Women who had studied up to secondary school or beyond were far more likely to make four or more visits (71%) compared to those with less education (51%).

Table 4: Reasons For Non-Utilization of Anc Among Women Who Attended No Check-Up (N = 15)

REASON	NUMBER (N)	PERCENT (%)
LACK OF KNOWLEDGE ABOUT ANC	4	26.67%
NEED NOT FELT / CONSIDERED NORMAL	4	26.67%
FINANCIAL CONSTRAINTS	0	0.00%
SERVICES NOT ACCEPTABLE	1	6.67%
NO TRANSPORT	6	40.00%
NO SUITABLE ESCORT	0	0.00%
TOO BUSY WITH HOUSEWORK	0	0.00%

OTHERS	0	0.00%
TOTAL	15	100.00%

Among the 15 women who did not attend any ANC check-up, the most common reason was lack of transport (40%), followed by lack of knowledge about ANC and the feeling that care was not needed (26.7% each).

DISCUSSION

The present study assessed the utilization of antenatal care services among women residing in the urban slums of Bhopal, generating a local evidence base in an area where such recent data were scarce.[6] The findings reveal both encouraging progress and areas that demand urgent programmatic attention. Our sample showed nearly universal contact with the health system during pregnancy: 96.3% of women attended at least one antenatal check-up.[24] This is a striking improvement over older slum-based studies, such as the one by Neyaz et al. in Aligarh, where only 49.5% of women had any ANC contact. The 12 year gap between that work and ours is a powerful illustration of how program efforts—including the National Health Mission—have extended the reach of maternal services even into disadvantaged urban pockets.[8]

The latest national figure, reported in NFHS-6 (2023-24), is 95.9% for any ANC, meaning the women in Bhopal's slums have now virtually matched the all India average.[24]

Coverage, however, must be measured not just by first contact but by continuity. In our study, 63.5% of attendees made four or more visits. This proportion is comparable to the 59.7% with four or more visits reported by Bahuguna et al. in Rishikesh and the roughly 64% adequate utilisation observed in Ahmedabad's slums. This suggests that a growing number of slum dwelling women are staying in the system, although more than a third still drop out before completing the recommended schedule. [14, 15]

Early registration is a cornerstone of quality ANC. Three-quarters of our respondents (74.2%) booked their first visit in the first trimester, just below the national NFHS-6 figure of 76.2%.

The proportion of women who delayed care until the third trimester was negligible (2.8%) This pattern indicates that messages about early pregnancy registration are penetrating even into poor urban communities, although continued effort is needed to reach the remaining 25%.[24]

The most concerning gap in our study was iron-folic acid (IFA) consumption. Only 44.4% of women took IFA for the recommended 100 days or more. This is roughly double the 21.4% regular IFA intake observed by Gill and Devgun in Amritsar's slums, but it still means that more than half of our mothers did not receive adequate protection against anaemia.[10]

The reasons women gave—forgetting (33.5%) and side effects (36.6%)—were identical to those reported in Amritsar and later work in Delhi's slums.[10,23] These persistent complaints highlight a failure in counselling during antenatal contacts.[23]

Tetanus-diphtheria (TD) immunization coverage paints a much brighter picture. In our sample, 85.6% of women received two doses or a booster, which is close to the near-universal coverage reported nationally. The reasons for incomplete TD immunization were primarily lack of time (39.0%) and not knowing its importance (23.7%), again pointing to counseling gaps that are easier to close than those for IFA because TD requires only a couple of injections.[24]

Maternal education emerged as the single most powerful determinant of adequate care. Women who had studied up to the secondary level or beyond were significantly more likely to make four or more visits (71% versus 51%, χ^2=16.63, p<0.001). [18,19] Yadav et al., using count-data modelling of national survey data, confirmed that maternal education is one of the strongest predictors of ANC use, and Kumar et al., analyzing NFHS-4, demonstrated that education, along with wealth and residence, shapes "full" antenatal care. [18,19]

Our data therefore sit squarely within the established pattern: better-schooled women are more likely to understand the need for care, to negotiate household resources, and to navigate the health system.[18]

Socioeconomic status showed a trend 66% of women in higher classes completed four or more visits compared with 58% in lower classes—but this difference fell just short of statistical significance (p=0.096).

This is partly because the modified Kuppuswamy scale compresses a wide economic range into a few categories, but it also suggests that in Bhopal's slums, where almost everyone is poor, income gradients within the sample are less pronounced. Age, family type, religion, and birth order were not associated with adequate ANC in this study, diverging from earlier work in Lucknow where Sharma et al. found age and parity to be significant.[11] Such differences underline why local, context-specific data are essential for planning.[11]

Among the small group of 15 women who never attended any ANC, the most common reason was lack of transport (40%), followed by lack of knowledge about ANC and the feeling that care was not needed (26.7% each).[4] Financial constraints, long waiting times, and lack of an escort were not reported as main reasons in this group, although they have been prominent in other studies.[4,12]

The small number of non-attenders means these percentages must be read with caution, but the

message is still useful: even when services are free, reaching a facility can be an impossible obstacle if physical access is poor.[4] This finding reinforces the importance of doorstep services through ASHAs and mobile outreach.[4]

The reasons for incomplete ANC—particularly the high proportion of women who forget IFA or stop because of side effects—point to a quality of care deficit. Bajpai et al. had already cautioned that urban public services often fail to offer acceptable, respectful, and informative care.[12] Recent work on "adequate quality" antenatal care using NFHS-5 data showed that many women who receive the right number of visits still miss essential components such as IFA counselling and danger-sign education. The present study confirms that the same problem exists in Bhopal's slums: attendance is high, but the content of care is inconsistent.[17] The Janani Suraksha Yojana has boosted institutional deliveries and ANC contacts, but its benefits do not always reach the least educated and poorest women—the very group that needs intensive support. [20, 21]

Strengths and Limitations

The strengths of this study include its community-based design, a sample size that permits reasonable precision, and a structured questionnaire that separated reasons related to availability, awareness, and acceptability. ANC visits, IFA intake, and immunization were captured by maternal recall, which can introduce recall bias.

The cross-sectional nature of the study prevents causal inference.

The number of women who never sought care was very small, so the analysis of reasons is only indicative.

Despite these limitations, the study fills a critical local gap and provides actionable directions for urban maternal health programs in Bhopal.[6]

CONCLUSION

Antenatal coverage in the slums of Bhopal has reached encouraging levels—on par with national averages—but quality, continuity, and iron-folic acid supplementation remain weak.[24] Maternal education is the key factor that divides women who receive adequate care from those who do not.[18]

Programs must now shift their focus from simply registering women to ensuring that each antenatal contact is meaningful, informative, and supported by measures that remove transport and knowledge barriers.[4, 23]

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