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Original Research Article

Assessment of Quality of Antenatal Care Services in Public Health Facilities Using Donabedian Model

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Abstract:

Background/Introduction: Using the Donabedian model (structure, process, outcome), evaluate the quality of antenatal care (ANC) services in a tertiary care public hospital in Bihar. Determine the obstetric and sociodemographic factors linked to the adequacy of ANC.

Materials and Methods: From February 15 to August 25, 2025, a cross-sectional study was carried out at Government Medical College in Bettiah, Bihar. Eighty pregnant or recently delivered women (within six weeks postpartum) who were either admitted to obstetric wards or attended the ANC clinic were enrolled one after the other. Mother and Child Protection cards, medical records, and a pre-tested semi-structured questionnaire based on the Donabedian framework and WHO ANC guidelines were used to gather data. Both process (number of visits, examinations, laboratory tests, counseling) and structural (staff, medications, vaccines, equipment) indicators were noted. Frequencies, percentages, means, and Chi-square tests were used to analyze the data using SPSS; $p<0.05$ was deemed significant.

Results: The majority of participants were multigravida (57.5%), from rural areas (65%), and between the ages of 20 and 24 (37.5%). IFA tablets (85%), TT vaccine (87.5%), and paramedical personnel (90%) were all readily available; 80% of respondents indicated that doctors were available. BP measurement (92.5%) and weight recording (87.5%) were the most common process indicators, whereas Hb estimation (72.5%), urine examination (65%), and counseling (60%) were less common. Just 52.5% had at least four ANC visits. Higher education ($p=0.02$) and living in an urban area ($p=0.04$) were substantially correlated with adequate ANC.

Conclusion: Important ANC process elements, such as laboratory testing, counseling, and the suggested number of visits, were subpar despite acceptable structural readiness. Two important factors that contributed to insufficient ANC were living in a rural area and having little education. Strengthening maternal health outcomes requires focused interventions to enhance process quality and lessen educational and rural disparities.

Keywords: Antenatal care quality, ANC utilization, maternal health services, health service delivery, and low- and middle-income countries.

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Introduction

Antenatal care (ANC) is a vital component of maternal healthcare that aims to provide the best possible health outcomes for both the mother and the fetus by detecting and managing pregnancy-related issues early.

Prenatal care services have become much more widely available in low- and middle-income countries (LMICs) during the past few decades. The potential influence on maternal and neonatal outcomes is limited, though, since mounting data indicates that more service usage does not always equate to better treatment quality. Disparities in prenatal care quality continue to be a significant public health issue on a global scale. While 87% of women received at least one ANC visit, only 73% received essential components like blood pressure measurement, urine testing, and blood testing, according to a multi-country analysis using data from 91 LMICs from the Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS).

In low-income countries, this percentage fell to 54%. Significant disparities in service delivery were also highlighted by the fact that women from the wealthiest families were almost four times more likely than those from the poorest households to get high-quality ANC [1]. In addition to differences in access, the care given during ANC visits is frequently insufficient. Even among women who started ANC early and finished four or more sessions, only 10–50% got all necessary components of treatment, including clinical tests and counseling services, according to research done in ten different countries. This result highlights the fact that the actual content of treatment provided is still subpar and that the number of visits is not a reliable predictor of quality [2].

Another important factor in determining the quality of prenatal care is the preparedness of the health system. Research from sub-Saharan Africa has demonstrated that although facility preparedness for basic treatments including tetanus toxoid immunization, intermittent preventative therapy, and iron supplementation was very high (about 80% or more), Only around 20% of people were prepared to screen for syphilis and manage hypertensive problems. Significant differences in contact coverage and effective coverage were also found when facility-level data and population-based questionnaires were linked, suggesting that many women who use services do not receive the proper treatment [3].

Poor maternity healthcare has serious repercussions. Improving prenatal, intrapartum, and postnatal care might lower maternal and newborn mortality by around 28% and stillbirths by 22% in a single year, according to modeling studies conducted across 81 LMICs. In order to make significant improvements in mother and child health outcomes, our findings highlight how crucial it is to enhance the quality of care within the current healthcare systems [4].

There are disparities in prenatal care quality both within nations and within healthcare sectors. According to a Brazilian research, women from wealthier homes had considerably higher mean quality scores for ANC services than women from poorer households, and women getting care in private facilities had higher mean quality scores than those receiving care in public facilities. Even after controlling for maternal variables, these gaps remained, indicating structural inequalities in the provision of services [5].

In this situation, finding gaps and enhancing maternal health outcomes require evaluating the quality of prenatal care services. A thorough framework for this kind of evaluation is provided by the Donabedian model, which assesses healthcare quality in terms of structure, procedure, and result. Thus, the current study was conducted to evaluate the standard of prenatal care services in a tertiary care setting using the Donabedian approach.

Materials and Methods

Study Design and Setting: This cross-sectional study, which was conducted in a hospital, used the Donabedian model to evaluate the quality of prenatal care (ANC) services.

The study was carried out at Government Medical College Bettiah, Bihar, a tertiary care facility that acts as a referral center for neighboring regions and serves a significant number of populations from both urban and rural areas.

The investigation was conducted from February 15, 2025, to August 25, 2025, a span of six months.

Study Population and Sample Size: Pregnant women who visited the prenatal outpatient department and women who had just given birth within six weeks of being admitted to the obstetrics wards during the research period made up the study population.

Sample Size: The research had 80 individuals in total. The length of the research period and feasibility issues were taken into account while determining the sample size.

Sampling Technique: All eligible women who attended the prenatal clinic or were hospitalized to the obstetrics wards throughout the research period were included one after the other until the target sample size of 80 participants was reached using a successive sampling procedure.

Study Variables: The quality of prenatal care services was the study's main outcome variable. In addition to obstetric parameters like parity and gravidity and health system-related factors like personnel, medication, and equipment availability, the independent variables included sociodemographic traits like age, education, place of residence, and socioeconomic status.

Investigations

Operational Definition: The Donabedian model, which consists of three elements: - structure, process, and outcome

This was used to evaluate the quality of prenatal care services. The availability of medical professionals, medications like iron and folic acid pills and tetanus toxoid, and necessary equipment were also considered structural components. The number of prenatal visits, clinical examinations (such as taking blood pressure, documenting weight, and examining the abdomen), laboratory tests, and counseling services were all part of the

process. Prenatal care services were evaluated for completeness and appropriateness.

Data Collection Tools and Technics: Data were collected using a pre-tested semi-structured questionnaire developed in accordance with WHO antenatal care guidelines and the Donabedian framework. Information was obtained through face-to-face interviews with the participants, and relevant details were verified using Mother and Child Protection (MCP) cards and available medical records wherever applicable.

Statistical Analysis: Microsoft Excel was used to enter the data, while SPSS (version XX) was used for analysis. Frequencies and percentages were used to represent categorical data, whereas mean ± SD was used to represent continuous variables. The student's t-test and the Chi-square test were employed for comparison. A trend analysis was conducted, and a p-value of less than 0.05 was deemed statistically significant.

Ethical Consideration: The Institutional Ethics Committee granted ethical clearance. When necessary, informed consent was acquired, and patient data confidentiality was rigorously upheld.

Results: The study, which was carried out at Government Medical College Bettiah, Bihar, had 80 subjects in total. The findings are shown below in terms of obstetric profile, sociodemographic traits, prenatal care service quality, and variables related to ANC adequacy.

Table 1: Socio-demographic characteristics of participants (N=80):

Variable	Category	Frequency (N)	Percentage (%)
Age (years)	<20	10	12.5
	20-24	30	37.5
	25-29	24	30.0
	≥30	16	20.0
Education	illiterate	18	22.5
	primary	20	25.0
	Secondary	26	32.5
	graduate and above	16	20.0
residence	rural	52	65.0
	urban	28	35.0

The age group of 20–24 years old made up the majority of participants (37.5%), followed by 25–29 years old (30%). The study population was primarily rural, as evidenced by the fact that 65% of the women came from rural regions. In terms of education, 22.5% were illiterate and 32.5% had completed secondary school.

Table 2: Obstetric profile of participants (N=80):

Variable	category	frequency	Percentage
gravidity	primigravida	34	42.5
	multigravida	46	57.5
parity	0	34	42. 5
	1-2	36	45.0
	≥3	10	12.5
Trimester	1st	18	22.5
	2nd	36	45.0
	3rd	26	32.5

Multigravida made up more than half of the participants (57.5%). At the time of the study, 45% of the women were in the second trimester. Parity between one and two was present in nearly half (45%).

Table 3: Quality of antenatal care services (structure and process indicator):

Indicator	Available (N)	Percentage (%)
Availability of doctor	64	80
Availability of paramedical staff	72	90.0
Availability of IFA tablet	68	85.0
Availability of TT vaccine	70	87.5
≥4 ANC visits	42	52.5
BP measurement	74	92.5
Weight recording	70	87.5
Hb estimation	58	72.5
Urine Examination	52	65.0
Counselling Provided	48	60.0

The availability of TT vaccine (87.5%) and paramedical personnel (90%) was high among structural components, while the availability of necessary services like equipment and investigations was relatively low. In terms of process indicators, the majority of participants had their blood pressure measured (92.5%) and their weight recorded (87.5%), but only 60% of women received counseling services. Of the participants, only 52.5% had completed four or more ANC visits.

Table 4: Association of selected factors with adequacy of ANC services (N=80):

Variables	category	Adequate ANC	Inadequate ANC	Total	P- value
Education	Illiterate	6	12	18	
	Primary	8	12	20	
	Secondary	14	12	26	
	Graduate Plus	12	4	16	0.02
Residence	Rural	22	30	52	
	Urban	18	10	28	0.04

The adequacy of ANC services and educational status were found to be statistically significantly correlated ($p = 0.02$), with higher education being linked to better ANC utilization. In a similar vein, there was a significant correlation ($p = 0.04$) between residence and adequate ANC, with urban women being more likely than rural ones to receive it.

Discussion

Antenatal care (ANC) has both strengths and limitations, which are shown in this hospital-based research from Bettiah. These findings closely match trends observed in large, widely cited studies from low- and middle-income countries.

Just over half of the women in Bettiah completed at least four ANC visits (52.5%), with good rates of weight and blood pressure checks but inadequate coverage of counseling, urine tests, and hemoglobin testing. This is similar to multicountry studies where blood pressure is nearly always measured, but blood, urine, and counseling tests are far less reliable [6].

Contact frequently surpasses substance, as evidenced by the fact that only 10–50% of women in 10 countries got all essential components, even among those with ≥4 visits beginning early [7]. According to national Indian data, only around one-fifth of women obtain adequate-quality ANC, despite the fact that approximately 59% of women have at least four visits [8].

This tertiary facility's high personnel, IFA, and TT vaccine availability is consistent with results that many hospitals have adequate infrastructure for basic ANC inputs [9].Global evaluations, however, reveal that actual adherence to evidence-based treatment is little connected with structural preparedness; facilities with comparable resources might provide considerably different quality [10]. The coverage of ≥4 ANC visits in Bettiah is 52.5%, which is in line with the ~40–60% range reported globally [11,12]. Blood pressure measurement among ANC users is high at 92.5%, which is comparable to levels frequently exceeding 90% [6]. Urine testing coverage is within the commonly reported 40–80% range and continues to be one of the least consistently performed components [7]. Nevertheless, the proportion of women receiving adequate-quality ANC (all essential components) is low, which is consistent with evidence that only 10–50% of women with ≥4 visits receive full care [12].

According to this study, women who were more educated and lived in cities had far higher ANC adequacy. Higher maternal education, affluence, and urban residency highly predict completing recommended visits and obtaining high-quality ANC, according to large, pooled analyses from 69–91 countries [13]. Rich, educated, urban women who visit hospitals in Nepal and India are more likely to obtain all of the necessary ANC components [12]. As a result, the Bettiah results align with worldwide data about socio-demographic differences in quality.

Limitations

This study was limited to primary and community-level settings since it was a single-center, hospital-based study carried out at a tertiary care institution.

Causal conclusions between sociodemographic characteristics and ANC adequacy are limited by the cross-sectional approach.

Statistical power and representation may be diminished by the small sample size (n=80). Selection bias may be introduced by consecutive sampling. Maternal and perinatal outcomes were not thoroughly evaluated, and the use of self-reported data may result in memory bias.

Conclusion

While several structural aspects of prenatal care, such as the availability of paramedical personnel, IFA tablets, and TT vaccination, were generally acceptable at the tertiary care institution, significant process elements remained poor, according to the study employing the Donabedian model.

Only nearly half of the women completed at least four ANC sessions, and a significant part of them received insufficient counseling services, despite the fact that blood pressure and weight measurements were frequently carried out.

The adequacy of ANC was significantly correlated with both place of residence and educational status, meaning that women who lived in urban areas and had higher levels of education were more likely to obtain full ANC services. These results demonstrate ongoing disparities in ANC use and emphasize the necessity of improving ANC coverage and quality, especially for rural and less educated women. Improving outreach to underprivileged populations, maintaining continuity of treatment, and bolstering counseling should be top priority for enhancing maternal health outcomes.

References

1. Arsenault C, Jordan K, Lee D, et al. Equity in antenatal care quality: an analysis of 91 national household surveys. The Lancet. Global Health. 2018;6:e1186 - e1195. doi:10.1016/s2214-109x(18)30389-9
2. Benova L, Tunçalp Ö, Moran A, Campbell O. Not just a number: examining coverage and content of antenatal care in low-income and middle-income countries. BMJ Global Health. 2018;3. doi:10.1136/bmjgh-2018-000779
3. Kanyangarara M, Munos M, Walker N. Quality of antenatal care service provision in health facilities across sub–Saharan Africa: Evidence from nationally representative health facility assessments. Journal of Global Health. 2017;7. doi:10.7189/jogh.07.021101
4. Chou VB, Walker N, Kanyangarara M. Estimating the global impact of poor quality of care on maternal and neonatal outcomes in 81 low- and middle-income countries: A modeling study. PLoS Medicine. 2019;16. doi: 10.1371/journal.pmed.1002990
5. Victora C, Matijasevich A, Silveira MF, Santos I, Barros A, Barros F. Socio-economic and ethnic group inequities in antenatal care quality in the public and private sector in Brazil.. Health policy and planning. 2010;25 4:253-61. doi:10.1093/heapol/czp065
6. Arsenault C, Jordan K, Lee D, et al. Equity in antenatal care quality: an analysis of 91 national household surveys. The Lancet. Global Health. 2018;6:e1186 - e1195. doi:10.1016/s2214-109x(18)30389-9
7. Benova L, Tunçalp Ö, Moran A, Campbell O. Not just a number: examining coverage and content of antenatal care in low-income and middle-income countries. BMJ Global Health. 2018;3. doi:10.1136/bmjgh-2018-000779
8. Girotra S, Malik M, Roy S, Basu S. Utilization and determinants of adequate quality antenatal care services in India: evidence from the National Family Health Survey (NFHS-5) (2019-21). BMC Pregnancy and Childbirth. 2023;23. doi:10.1186/s12884-023-06117-z
9. Chou VB, Walker N, Kanyangarara M. Estimating the global impact of poor quality of care on maternal and neonatal outcomes in 81 low- and middle-income countries: A modeling study. PLoS Medicine. 2019;16. doi: 10.1371/journal.pmed.1002990
10. Leslie H, Sun Z, Kruk M. Association between infrastructure and observed quality of care in 4 healthcare services: A cross-sectional study of 4,300 facilities in 8 countries. PLoS Medicine. 2017;14. doi: 10.1371/journal.pmed.1002464
11. Kuhnt J, Vollmer S. Antenatal care services and its implications for vital and health outcomes of children: evidence from 193 surveys in 69 low-income and middle-income countries. BMJ Open. 2017;7. doi:10.1136/bmjopen-2017-017122
12. Joshi C, Torvaldsen S, Hodgson R, Hayen A. Factors associated with the use and quality of antenatal care in Nepal: a population-based study using the demographic and health survey data. BMC Pregnancy and Childbirth. 2014;14:94 - 94. doi:10.1186/1471-2393-14-94
13. 13. Tessema Z, Teshale AB, Tesema G, Tamirat K. Determinants of completing recommended antenatal care utilization in sub-Saharan from 2006 to 2018: evidence from 36 countries using Demographic and Health Surveys. BMC Pregnancy and Childbirth. 2021; 21. doi:10.1186/s12884-021-03669-w.