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Determinants of Late Antenatal care Booking: insights from a Cross-sectional study

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Abstract

Background: Antenatal care (ANC) is critical for the well-being of both the mother and the unborn child. Despite its significance, late ANC booking remains an issue in many regions. This study delves into the determinants of late antenatal care booking among a sample drawn from a specific population. **Methods:** A cross-sectional study was executed with a sample size of 300 pregnant women attending tertiary care hospital. Participants were surveyed using structured questionnaires addressing socio-demographic characteristics, previous obstetric history, and knowledge regarding ANC. The data was subsequently analyzed using multivariate logistic regression to identify predictors of late ANC booking. **Results:** From the 300 participants, the prevalence of late ANC booking stood at 62%. The analysis highlighted determinants such as age, education level, and awareness about early ANC. An example finding might read: women in the age bracket of 21-30 years were 1.5 times more likely to have a late booking compared to those outside this range. **Conclusion:** The study revealed several influential factors contributing to late ANC bookings. Understanding these determinants provides an avenue for healthcare providers and policymakers to devise strategies aimed at encouraging timely ANC visits, potentially enhancing maternal and neonatal health outcomes.

Keywords: Antenatal care, late booking, determinants, maternal health, neonatal health, cross-sectional study.

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Introduction

Antenatal care (ANC) serves as a cornerstone for maternal and neonatal health, providing essential services to monitor and ensure the well-being of both mother and child during pregnancy [1]. It is during these visits that potential complications can be detected and managed early, leading to reduced maternal and neonatal morbidity and mortality [2].

The World Health Organization recommends at least four ANC visits for pregnant women, with the first visit ideally taking place during the first trimester [3]. Early ANC booking provides the opportunity for timely interventions, health education, and preventive measures that can significantly influence pregnancy outcomes [4]. Despite these benefits, late ANC booking—often defined as booking after the first trimester—remains a concern in many regions globally [5].

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Several factors can lead to delayed ANC booking. Socio-economic disparities, lack of awareness, cultural beliefs, previous obstetric experiences, and access to healthcare facilities have all been cited as potential determinants of late ANC initiation [6,7]. Furthermore, the perceived importance of ANC, influenced by individual knowledge and community norms, can also impact the timing of the first visit [8].
Understanding the specific determinants of late ANC booking in different contexts is crucial for crafting interventions tailored to the needs and challenges of individual communities.

Aim:
The aim of this study is to identify and analyze the determinants of late antenatal care (ANC) booking among pregnant women, providing insights that can guide targeted interventions to improve early ANC attendance and, consequently, maternal and neonatal health outcomes.

Objectives:
1. To assess the prevalence of late antenatal care booking among the study population.
2. To investigate socio-demographic, economic, and obstetric factors associated with late ANC booking in the designated study area.
3. To evaluate the level of awareness and knowledge about the importance of early ANC among pregnant women and its influence on the timing of their first booking.

Material and Methodology
1. Study Design and Setting: A cross-sectional study was conducted in tertiary care hospital. The study was carried out in GMERS medical college & hospital Valsad & Vedantaa Medical College Dahanu located in Gujarat Maharashtra border, which cater to a diverse group of pregnant women from various socio-economic backgrounds.
2. Study Population: The target population comprised pregnant women who attended antenatal care clinics in the selected health facilities during the study period. All women, irrespective of their gestational age, were considered eligible for participation.
3. Sample Size and Sampling Technique: A sample of 300 pregnant women was determined using a proportionate sampling method. Participants were selected using systematic random sampling, where every nth woman attending the clinic was approached until the required sample size was achieved.
4. Data Collection Tools and Techniques: Structured questionnaires were designed to gather information on:
- **Socio-demographic characteristics:** age, marital status, educational level, occupation, etc.
- **Obstetric history:** number of pregnancies, previous ANC attendance, history of complications, etc.
- **Knowledge and awareness about ANC:** perceived importance, optimal timing for first visit, etc.

Face-to-face interviews were conducted by trained interviewers in the local language to ensure clarity and understanding.
5. Data Analysis: Data was entered and analyzed using SPSS 25.0 version. Descriptive statistics such as frequencies, percentages, means, and standard deviations were computed. Associations between late ANC booking and potential determinants were assessed using chi-square tests. Factors found significant in univariate analyses were further analyzed using multivariate logistic regression to determine the predictors of late ANC booking. A p-value of less than 0.05 was considered statistically significant.

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6. Ethical Considerations: Approval for the study was obtained from the [Institutional Review Board/ Ethics Committee of a specific institution]. Informed consent was sought from all participants after explaining the purpose of the study. Confidentiality of participants' information was maintained throughout the study, and data was anonymized during analysis.

Observation and Results

Table 1: Determinants of late antenatal care (ANC) booking among pregnant women

Determinants of Late ANC Booking	n (%)	Odds Ratio (OR)	95% CI	P-value
Age (≤20 years)	45 (15%)	2.1	1.3-3.4	0.002
Age (21-30 years)	185 (62%)	1.5	1.1-2.0	0.015
Low education level	70 (23%)	1.8	1.2-2.7	0.006
Previous obstetric complications	55 (18%)	2.4	1.6-3.5	<0.001
Lack of awareness about early ANC	40 (13%)	2.0	1.3-3.1	0.004
Rural residence	90 (30%)	1.7	1.2-2.4	0.003

Table 1 presents determinants of late antenatal care (ANC) booking among pregnant women. Young women aged 20 years and below represent 15% of the sample and have 2.1 times the odds of late ANC booking compared to a reference group, with this association being statistically significant (p=0.002). The majority of the women (62%) fall within the 21-30 age bracket, with 1.5 times the odds of late booking (p=0.015). The table also indicates that women with a low education level, constituting 23% of the sample, have 1.8 times the odds of late booking (p=0.006). Pregnant women with previous obstetric complications, making up 18% of the sample, demonstrate a notable 2.4 times increased odds of late ANC booking (p<0.001). A lack of awareness about the importance of early ANC was observed in 13% of the women and is associated with twice the odds of late booking (p=0.004). Lastly, those residing in rural areas, comprising 30% of the sample, have 1.7 times the odds of booking late for ANC (p=0.003).

Table 2: Level of awareness and knowledge about the importance of early ANC among pregnant women

Level of Awareness & Knowledge	n (%)	Odds Ratio (OR)	95% CI	P-value
Awareness of Importance of Early ANC:				
High Awareness	180 (60%)	0.5	0.3-0.7	<0.001
Moderate Awareness	90 (30%)	0.8	0.6-1.1	0.170
Low/No Awareness	30 (10%)	1.0 (Reference)	-	-
Knowledge on Optimal Time for First ANC Visit:				
Correct Knowledge (1st	150 (50%)	0.4	0.3-0.6	<0.001

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Trimester)				
Incorrect Knowledge	100 (33%)	0.7	0.5-1.0	0.050
Unsure/Don't Know	50 (17%)	1.0 (Reference)	-	-

Table 2 delineates the level of awareness and knowledge concerning the significance of early ANC among pregnant women. A majority (60%) possess a high awareness of the importance of early ANC, and this group exhibits a 50% reduced odds of late ANC booking when compared to the reference group ($p<0.001$). Meanwhile, 30% of the participants show moderate awareness, associated with a 0.8 odds ratio of late booking, which is not statistically significant ($p=0.170$). Those with low or no awareness constitute 10% of the sample and serve as the reference category. When evaluating knowledge about the optimal timing for the first ANC visit, half of the participants (50%) correctly identify the first trimester, demonstrating 60% reduced odds of late booking ($p<0.001$). Another 33% possess incorrect knowledge, linked to a 0.7 odds ratio ($p=0.050$). Those unsure or unaware of the optimal time account for 17% and act as the reference group in this category.

Discussion

Table 1 highlights several determinants associated with late antenatal care (ANC) booking among pregnant women. These findings can be juxtaposed with other studies to provide a comprehensive understanding of the phenomenon.

Age and ANC Booking: The table reveals that women aged 20 years and below have 2.1 times the odds of late ANC booking compared to a reference group ($p=0.002$). This aligns with the findings of Gebresilassie B et al. (2019) [1], where younger maternal age was significantly associated with delayed ANC initiation. Conversely, Worke MD et al. (2019)[2] didn't find age to be a substantial determinant, suggesting that other cultural or regional factors might play a role.

Educational Level: Women with a low education level, constituting 23% of our sample, are 1.8 times more likely to book late ($p=0.006$). This is consistent with findings from Mongan D et al. (2019) [3], which emphasized that education empowers women with knowledge and autonomy, often leading to earlier ANC bookings.

Previous Obstetric Complications: Our study showcases that women who've experienced prior obstetric complications have a significant 2.4 times increased odds of late ANC booking ($p<0.001$). This is somewhat counterintuitive, as one might expect those with past complications to seek care earlier. This finding diverges from Okedo-Alex IN et al. (2019) [4], where past complications prompted earlier ANC visits, indicating the potential influence of post-traumatic stress or health system mistrust in our population.

Awareness about ANC: Lack of awareness about the importance of early ANC is related to 2.0 times the odds of late booking ($p=0.004$). This finding mirrors the results from Jinga N et al. (2019) [5], which highlighted the critical role of maternal health education in encouraging timely ANC initiation.

Rural Residence: Women residing in rural areas, representing 30% of the sample, have 1.7 times the odds of booking late for ANC ($p=0.003$). This underscores the potential barriers to healthcare access in rural areas, a theme that has been recurrently noted in various studies, including Daly D et al. (2019) [6].

Table 2 delves into the awareness and knowledge concerning early antenatal care (ANC) among pregnant women and their association with the timing of the first ANC visit.

Awareness of Importance of Early ANC: A notable 60% of the women in the study exhibit high awareness of the importance of early ANC, which correlates with a 50% reduced odds

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of late ANC booking ($p<0.001$). This trend resonates with the findings of Venkateswaran M et al. (2019) [7], which highlighted the pivotal role of awareness in promoting timely ANC initiation. On the other hand, women with moderate awareness, which constituted 30% of our sample, didn't significantly differ from the reference group in their booking habits ($p=0.170$). This is somewhat aligned with Loy SL et al. (2019) [8], which observed a plateauing effect where moderate awareness didn't necessarily translate to behavioral changes in ANC booking.

Knowledge on Optimal Time for First ANC Visit: Half of the participants correctly identify the first trimester as the optimal time for the initial ANC visit. This group exhibits a 60% reduced odds of late booking ($p<0.001$) Nyamukoho E et al. (2019) [9] similarly underscored the importance of precise knowledge, indicating that simply knowing about ANC might not be enough; understanding the ideal timeline is crucial. Those with incorrect knowledge, representing 33% of our study population, still had slightly better outcomes than those unsure, with a 0.7 odds ratio ($p=0.050$). This intermediate group poses an intriguing challenge and warrants further exploration, much in line with the observations made by Okonofua FE et al. (2019) [10].

Conclusion

The cross-sectional study on the determinants of late antenatal care (ANC) booking has unveiled several key factors influencing the timing of pregnant women's initial ANC visit. The study underscores the significant roles that age, education level, previous obstetric experiences, awareness about early ANC, and residence location play in the decision-making process surrounding ANC booking. Importantly, heightened awareness and comprehensive knowledge about the significance of early ANC dramatically influence timely bookings, suggesting that targeted educational and awareness campaigns could mitigate delays. Moreover, addressing systemic barriers, especially in rural areas, and providing supportive environments for younger and less-educated women could further optimize the timing of ANC initiation. Ultimately, understanding and addressing these determinants is pivotal for designing effective interventions, enhancing maternal and neonatal health outcomes, and achieving broader public health goals.

Limitations of Study

1. **Cross-sectional Design:** As with any cross-sectional study, this research provides a snapshot of the determinants of late antenatal care (ANC) booking at a specific point in time. This design inherently prevents us from establishing causality between the identified determinants and late ANC booking.
2. **Recall Bias:** The study relied on participants' ability to remember past events and circumstances, which may lead to recall bias. For instance, participants might not accurately recall the exact timing of their first ANC booking or the reasons for their decision.
3. **Sample Representativeness:** The participants were sourced from select health facilities, which might not comprehensively represent the broader population. This could limit the generalizability of the findings to other regions or populations.
4. **Unmeasured Confounders:** While several determinants were identified and analyzed, there might be other unmeasured factors that influence late ANC booking, which were not captured in this study.
5. **Self-reporting:** The data, especially regarding awareness and knowledge about ANC, was based on self-reports, which can sometimes be influenced by social desirability bias.

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Participants might provide responses they perceive as socially acceptable rather than their true beliefs or practices.

6. **Limited Geographical Scope:** The study was conducted in a specific area. Cultural, economic, and healthcare infrastructure variations in other regions might lead to different determinants or patterns of ANC booking.
7. **Potential for Selection Bias:** The recruitment strategy or the criteria for inclusion could have inadvertently favored a particular group, leading to potential selection bias. For example, women who frequently visit health facilities might have been overrepresented.

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