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Original Article

Perinatal Mortality in Booked and Unbooked Pregnancies: An Analytical Cross-Sectional Study

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ABSTRACT

Perinatal mortality remains a major public health challenge in developing countries, where inadequate antenatal care contributes significantly to preventable fetal and early neonatal deaths. **Objectives:** To compare perinatal mortality between booked and unbooked women presenting to a tertiary care hospital and to identify factors associated with adverse perinatal outcomes. **Methods:** This analytical cross-sectional study was conducted at Imran Idrees Teaching Hospital, Sialkot, from January to August 2025 after ethical approval (MRC/IRB/24043). A total of 310 women with singleton pregnancies beyond 28 weeks of gestation were enrolled through non-probability consecutive sampling and categorized as booked or unbooked based on antenatal care status. Data were analyzed using SPSS version 25. Quantitative variables were expressed as Mean ± SD, and qualitative variables as n (%). Chi-square test was used for comparison. A p-value ≤0.05 was considered statistically significant. **Results:** Out of 310 participants, 158 (51.0%) were booked, and 152 (49.0%) were unbooked. Overall perinatal mortality was 30 (9.7%). Mortality was significantly higher among unbooked women compared to booked women [24 (15.8%) vs 6 (3.8%); p=0.001]. Birth asphyxia (5.2%) and neonatal sepsis (3.9%) were the leading causes. Maternal age, parity, previous caesarean section, and mode of delivery were not significantly associated with perinatal mortality (p>0.050). **Conclusions:** Perinatal mortality was significantly higher among unbooked women. Strengthening antenatal booking services may reduce preventable perinatal deaths.

INTRODUCTION

Perinatal death is an important indicator of maternal and neonatal health care quality, which implies the provision of effective prenatal, intrapartum, and early neonatal services. It includes fetal deaths following 28 gestation weeks, intrapartum stillbirths, and early infant deaths during the first week of life. Despite the global progress achieved in maternal health, the perinatal death rates are alarmingly high in developing nations, primarily because most of the mortality is avoidable when proper and adequate antenatal care is administered in time [1]. Antenatal booking enables early detection of high-risk pregnancies, proper monitoring, and obstetric interventions. When women are subjected to frequent antenatal care, chances are high that they can be screened for maternal and fetal complications, counseled on danger signs, and scheduled for a birth under expert supervision. On the other hand, un-booked pregnancies normally show up late with avoidable complications, resulting in a high rate of adverse perinatal outcomes. Several Pakistani studies have repeatedly shown a higher perinatal mortality rate in un-booked mothers than in booked mothers [2-4]. Ajmal *et al.* further reported that lack of antenatal booking was strongly associated with increased perinatal mortality and delayed presentation to tertiary care facilities [5]. Similarly, Baloch *et al.* observed poorer maternal and neonatal outcomes among unbooked women, emphasizing

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the protective role of structured antenatal care [6]. In Pakistan, a significant proportion of pregnant women remain unbooked due to socioeconomic constraints, limited healthcare accessibility, cultural practices, and lack of awareness about the importance of antenatal care. This is particularly concerning given that perinatal mortality rates in the country remain among the highest in the region. Recent institutional data is needed to identify preventable factors contributing to perinatal mortality and to inform strategies for improving maternal and neonatal outcomes. International evidence supports similar findings. Okojie *et al.* in a tertiary hospital-based study, reported increased fetal and maternal complications among unbooked patients, highlighting inadequate antenatal surveillance as a major contributing factor [7, 8]. A retrospective cohort study from Lagos by Ugwu *et al.* also demonstrated significantly higher perinatal morbidity and mortality among unbooked mothers, attributing these outcomes to delayed referral and limited emergency obstetric services [9]. Almarri *et al.* in a large institutional study from Saudi Arabia, observed differences in mortality outcomes between booked and unbooked women, although the magnitude of disparity was lower in a well-resourced healthcare setting [10].

These variations suggest that the impact of antenatal booking may be influenced by healthcare infrastructure and access to neonatal care services. In Pakistan, the number of pregnant women who are un-booked during pregnancy is quite high, with reference to socioeconomic factors, ignorance, culture, and accessibility of health facilities. Even though some local studies have compared perinatal outcomes in booked and non-booked pregnancies, there is a scarcity of recent institutional data that specifically addresses the patterns of perinatal mortality. Recent local data is needed to detect the factors of perinatal mortality that can be prevented and to inform the strategies to enhance maternal and neonatal outcomes. This study aimed to analyze whether a lack of antenatal booking is associated with increased perinatal mortality in a tertiary care setting. To compare perinatal mortality between booked and unbooked women and to evaluate factors associated with adverse perinatal outcomes.

METHODS

This analytical cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Imran Idrees Teaching Hospital, Sialkot, from January to August 2025. The research was approved by the institution under approval number MRC/IRB/24043; dated 16th September 2024. The informed consent of all participants was obtained in writing, and the confidentiality of patient information was maintained during the study as required by the ethics. The sample size was calculated using the formula for comparison of two proportions as described by Ugwu et al. [10] based on perinatal mortality among booked and unbooked women. Based on previously reported perinatal mortality rates of 15% in unbooked women and 5% in booked women [4], a 95% confidence level (Z = 1.96) and 80% study power (Z = 0.84) were applied. The minimum calculated sample size was 138 participants per group (total = 276). After adding 10% to account for incomplete data, the final required sample size was 303, which was rounded to 310 participants. Sample size was calculated using the formula for comparison of two proportions: $n = (Z_{\alpha/2} + Z_{\beta})^2 [P_1(1-P_1) + P^2(1-P_2)] / (P_1 - P_2)^2$. Where: P_1 = proportion of perinatal mortality in unbooked women (15%), P_2 = proportion of perinatal mortality in booked women (5%), $Z_{\alpha/2}$ = 1.96 at 95% confidence level, and Z_{β} = 0.84 at 80% power. Non-probability consecutive sampling was used to enroll 310. Women who had singleton pregnancies that occurred later than 28 weeks of gestation. The women were classified as booked and un-booked about their antenatal care. Booked cases were defined as women who attended at least four antenatal visits, with the first visit occurring in the first trimester of pregnancy, in accordance with the World Health Organization's minimum recommendation for adequate antenatal care. Women who attended fewer than four visits, had no antenatal care, or presented for the first time in the third trimester were classified as unbooked This definition was chosen based on WHO guidelines recommending a minimum of four antenatal visits for uncomplicated pregnancies. Although current WHO guidelines recommend eight contacts, the four-visit model remains a pragmatic threshold in resource-limited settings and was used in this study to maintain comparability with prior local research. The study included women who had already delivered between 18 and 45 years and whose gestation period was 28 weeks. Patients with known medical or obstetric conditions that could independently influence perinatal outcomes (diabetes mellitus, hypertension, antepartum hemorrhage, malpresentation, congenital fetal anomalies, and intrauterine growth restriction) were excluded to minimize confounding. This exclusion was necessary to isolate the effect of booking status on perinatal mortality but represents a significant limitation of the study, as the findings may not be generalizable to high-risk obstetric populations. Perinatal mortality was considered to be fetal death at the age of 28 weeks or later, intrapartum stillbirth, or early neonatal death within seven days of life. All patients admitted were observed during their stay until delivery, and infants during the first seven days of their lives, to record perinatal outcomes. The demographic, obstetric, and clinical information were entered on a pre-designed proforma.

The data were keyed into and analyzed in the Statistical

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Package of Social Sciences (SPSS) version 25.0. Mean values with a standard deviation were used to provide quantitative variables, including maternal and gestational age, whereas frequencies and percentages were used to provide qualitative variables, including booking status and perinatal mortality. Chi-square test was used to compare the perinatal mortality in booked and unbooked groups. Stratification was performed by potential effect modifiers, including maternal and gestational age. A p-value ≤ 0.05 was considered statistically significant.

RESULTS

It shows that among 310 women, the mean age was 29.5 ± 6.4 years, mean gestational age at presentation was 34.3 ± 3.7 weeks, and mean gestational age at delivery was 37.4 ± 3.5 weeks, with 158 (51.0%) booked and 152 (49.0%) unbooked. Previous caesarean section was present in 159 (51.3%), normal vaginal delivery in 173 (55.8%), and caesarean section in 137 (44.2%). Among 30 perinatal deaths, birth asphyxia (16; 5.2%), neonatal sepsis (12; 3.9%), and meconium aspiration (11; 3.5%) were reported, but these percentages appear to be calculated out of the total 310 rather than out of 30 deaths (Table 1).

Table 1: Baseline Clinical Characteristics of Study Participants and Causes of Perinatal Mortality (n=310)

Variables	Category	n (%) / Mean ± SD
Continuous Variables		
Age (Years)	–	29.5 ± 6.4
Gestational Age at Presentation (Weeks)	–	34.3 ± 3.7
Gestational Age at Delivery (Weeks)	–	37.4 ± 3.5
Categorical Variables		
Booking Status	Booked	158 (51.0%)
	Unbooked	152 (49.0%)
Socioeconomic Status	Low	108 (34.8%)
	Middle	92 (29.7%)
	High	110 (35.5%)
Previous C-Section	Yes	159 (51.3%)
	No	151 (48.7%)
Mode of Delivery	Normal Vaginal Delivery	173 (55.8%)
	Caesarean Section	137 (44.2%)
Causes of Perinatal Mortality (n=30)		
Birth Asphyxia	–	16 (5.2%)
Neonatal Sepsis	–	12 (3.9%)
Meconium Aspiration	–	11 (3.5%)

Most participants belonged to low (34.8%) and middle (29.7%) socioeconomic groups, while 35.5% belonged to a high socioeconomic status. A history of previous caesarean section was present in 159 (51.3%) patients. Regarding mode of delivery, 173 (55.8%) patients delivered by normal vaginal delivery, whereas 137 (44.2%) underwent caesarean section. Overall, 30 (9.7%) cases of perinatal mortality were recorded. When stratified by booking status, perinatal mortality was observed in 6 (3.8%) booked patients compared with 24 (15.8%) unbooked patients. (p=0.001) (Table 2).

Table 2: Comparison of Perinatal Mortality Between Booked and Un-booked Patients

Booking Status	Perinatal Mortality Yes, n (%)	Perinatal Mortality No, n (%)	p-value
Booked (n=158)	6 (3.8%)	152 (96.2%)	0.001*
Un-booked (n=152)	24 (15.8%)	128 (84.2%)	
Total	30 (9.7%)	280 (90.3%)	

*p ≤ 0.050 considered statistically significant

Among the 30 cases of perinatal mortality, the most common causes were birth asphyxia (16 cases; 53.3%), neonatal sepsis (12 cases; 40.0%), and meconium aspiration (11 cases; 36.7%). Note: Some deaths had multiple causes. To control for potential effect modifiers, stratification was performed for maternal age, parity, previous caesarean section, and mode of delivery. After stratification, perinatal mortality remained higher among un-booked patients across all strata. However, maternal age, parity, previous caesarean section, and mode of delivery did not show a statistically significant association with perinatal mortality on post-stratification analysis (p>0.050) (Table 3).

Table 3: Stratified Analysis of Perinatal Mortality by Potential Effect Modifiers

Effect Modifier	Category	Booking Status	Perinatal Mortality Yes, n (%)	Perinatal Mortality No, n (%)	p-value*
Maternal Age < 30	≤30	Booked	2 (3.0%)	65 (97.0%)	0.001
	≤30	Unbooked	13 (15.1%)	85 (84.9%)	
Maternal Age >30	>30	Booked	4 (4.4%)	87 (95.6%)	0.002
	>30	Unbooked	11 (16.4%)	56 (83.6%)	
Parity ≤2	≤2	Booked	2 (3.7%)	52 (96.3%)	0.001
	≤2	Unbooked	9 (13.0%)	60 (87.0%)	
Parity >2	>2	Booked	4 (3.8%)	100 (96.2%)	0.001
	>2	Unbooked	15 (17.4%)	71 (82.6%)	
Previous C-Section	Yes	Booked	3 (4.2%)	68 (95.8%)	0.001
	Yes	Unbooked	14 (20.0%)	56 (80.0%)	
	No	Booked	3 (3.4%)	84 (96.6%)	0.001
	No	Unbooked	10 (12.5%)	70 (87.5%)	
Mode of Delivery	NVD	Booked	4 (4.2%)	92 (95.8%)	0.001
	NVD	Unbooked	11 (12.9%)	74 (87.1%)	
	Caesarean	Booked	2 (3.3%)	60 (96.7%)	0.001
	Caesarean	Unbooked	13 (19.7%)	62 (80.3%)	

DISCUSSION

The present study found a significantly higher proportion of perinatal mortality among unbooked patients than among booked patients (15.8% vs 3.8%; p=0.001). This finding indicates that lack of antenatal booking is a major determinant of adverse perinatal outcome in the studied

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population. This finding indicates that lack of antenatal booking is strongly associated with adverse perinatal outcomes in the studied population. Similar findings have been reported in local Pakistani populations. Kanwal *et al.* conducted a comparative cross-sectional study in Faisalabad, Pakistan, during January–March 2025, including 570 women (285 booked and 285 un-booked). They reported intrauterine death in 10.18% of un-booked versus 3.86% of booked patients and neonatal death in 4.56% vs 1.76%, respectively, with statistically significant differences [2]. These proportions are comparable to those observed in the present study and support the consistency of findings within similar healthcare settings. At the national level, a study published in the Pakistan Journal of Health Sciences evaluated pregnancy outcomes in booked and un-booked women in a tertiary care hospital and reported significantly higher perinatal mortality among un-booked mothers, particularly related to delayed presentation and lack of antenatal surveillance [8]. In spite of the fact that the proportions were different because of variability in sample size and duration of the study, the tendency of the association was similar to that of the current study. On a regional basis, Okojie *et al.* conducted research during 12 months in Benin City, Nigeria, involving 420 deliveries. They also stated that the perinatal mortality rate was 18.2% among un-booked women as opposed to 5.4% among booked women [7]. These are larger percentages than we have seen in the current study, and they could be due to a difference in neonatal care infrastructure and referral system, but they also indicate the negative influence of non-booking on perinatal survival. Rouzi *et al.* examined a total of 10,781 deliveries in Jeddah, Saudi Arabia, that occurred between 2011 and 2019 at the global level. They did not find any statistically significant difference in perinatal mortality between booked and un-booked women (overall perinatal mortality 1.29; p=0.347), like in low- and middle-income settings [8]. The reduced mortality rates and absence of a significant difference are potentially explained by the advanced obstetric and neonatal services, indicating that the impact of antenatal booking on perinatal mortality is extremely reliant on the capacity of the healthcare system [9]. Ugwu *et al.* in a prospective study of 900 women, reported higher adverse outcomes among unbooked mothers, including increased low birth weight (14.7% vs 12.8%), preterm delivery (19.2% vs 17.2%), and postpartum hemorrhage (13.8% vs 2.6%) [10]. These findings support the present study, where unbooked women demonstrated a significantly higher perinatal mortality rate (15.8% vs 3.8%; p=0.001). The similarity in trends suggests that inadequate antenatal booking contributes to preventable perinatal complications and mortality in tertiary care settings. A majority of studies with higher perinatal mortality rates than those presented in the current study were done in resource-restrained environments with limited access to emergency obstetric and neonatal care, whereas those with lower rates were done in areas with high incomes and well-developed referral networks and neonatal intensive care facilities. These gradients underscore the significance of antenatal booking in preventing perinatal deaths. The most frequently occurring perinatal mortality causes in the current research included birth asphyxia (5.2%), neonatal sepsis (3.9%), and meconium aspiration (3.5%), indicating that mostly intrapartum and early neonatal outcomes were covered. Similar findings have been reported in previous studies where birth asphyxia and neonatal infections were major contributors to perinatal mortality in low- and middle-income countries [11]. Large proportions of intrauterine and neonatal death cases were also reported by Kanwal *et al.* with complications in the intrapartum period playing a significant role [2]. Okojie *et al.* also found birth asphyxia and neonatal infections among unbooked mothers as the primary causes of perinatal mortality in Nigeria [7]. These commonalities indicate that the lack of antenatal care restricts early detection of the high-risk pregnancy and early intrapartum intervention. Conversely, Rouzi *et al.* found a greater prevalence of meconium-stained liquor in the non-booked mothers but did not find an equal rise in perinatal mortality [8]. Such disparity is probably due to superior neonatal resuscitation and acute postnatal care in high-resource environments. In the stratified analysis of maternal age, parity, previous caesarean section, and mode of delivery, none of these factors had a statistically significant association with perinatal mortality (p>0.050). It means that booking status was the major factor of the observed difference in perinatal mortality, but not maternal or obstetric features. These results are also observed in the African and South Asian literature [8], where booking status was also reported to be strongly correlated with adverse perinatal outcomes despite maternal age and parity [12-15]. In contrast, Rouzi *et al.* find that maternal age and method of delivery are predictors of booking status and are no longer direct predictors of perinatal mortality [8], highlighting differences in the scope of analysis and the healthcare environment. Khan and Naseeb conducted a study in a one-year audit at Jinnah Postgraduate Medical Centre, including 6,853 deliveries, and reported a high perinatal mortality rate of 60.5 per 1,000 live births, with 79.2% of deaths occurring in unbooked women [16]. Antepartum hemorrhage accounted for 30.3% of deaths, while hypertensive disorders contributed 23.1%. In comparison, the present study demonstrated significantly higher perinatal mortality among unbooked women (15.8% vs

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3.8%; p=0.001), supporting the association between inadequate antenatal care and increased perinatal deaths in tertiary care settings [16]. Khan *et al.* reported significantly poorer fetal outcomes among unbooked mothers, with fetal death occurring in 34.5% of unbooked cases compared to 2.2% among booked women (p=0.000) [17]. Similarly, in the present study, perinatal mortality was significantly higher among unbooked women (15.8%) compared to booked women (3.8%; p=0.001). Both studies demonstrate a consistent pattern that lack of antenatal booking is strongly associated with increased perinatal mortality and adverse fetal outcomes in tertiary care settings. In general, the current research confirms that unbooked status is related to a significantly greater percentage of perinatal mortality. These results are in agreement with the majority of local and regional research in low- and middle-income countries, whereas the variations found in the high-income environment can be deemed to be due to well-developed healthcare infrastructure and the capacity of neonatal care [18, 19]. The community-based awareness campaigns, increased access to maternal healthcare services, and early referral of high-risk pregnancies should be ranked among the priorities to improve the antenatal booking coverage. Enhancing intrapartum monitoring and neonatal resuscitation services can further decrease the number of preventable deaths in perinatal care, including those who come without any prior antenatal care [20].

A significant limitation of this study is that it was only carried out in one tertiary care hospital by using non-probability consecutive sampling, which may hinder the generalizability of the results to the rest of the population. A significant limitation of this study is the broad exclusion of common obstetric complications (diabetes, hypertension, antepartum hemorrhage, malpresentation, congenital anomalies, and IUGR). While this approach was intended to reduce confounding, it resulted in a highly selective, low-risk study population. Consequently, the findings may not be applicable to higher-risk pregnancies, which constitute a substantial proportion of perinatal mortality cases in real-world clinical settings. It would be beneficial to use a multicenter, large-scale prospective cohort study in the future so that future generalizations can be made and causal relationships can be established.

CONCLUSIONS

This study concludes that perinatal mortality is significantly higher among unbooked patients than among booked patients. This finding indicates that lack of antenatal booking is strongly associated with adverse perinatal outcomes in the studied population. Maternal age, parity, previous caesarean section, and mode of delivery did not independently influence perinatal mortality after stratification. These findings underscore the critical importance of antenatal booking in improving perinatal outcomes.

Authors' Contribution

Conceptualization: SA
Methodology: HA, FA
Formal analysis: WM
Writing and Drafting: HA
Review and Editing: SA, HA, FA, WM

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflict of Interest

All the authors declare no conflict of interest.

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REFERENCES

[1] World Health Organization. Report of the tenth meeting of the WHO Strategic and Technical Advisory Group of Experts for Maternal, Newborn, Child and Adolescent Health and Nutrition, 12-14 November 2024. World Health Organization. 2025 May.

[2] Kanwal I, Javed N, Murtaza A, Mustafa Z, Iqbal S, Khan S. Outcome of Pregnancy in Booked vs Un-Booked Patients. Indus Journal of Bioscience Research. 2025 May 8;3(5):187-91. doi: 10.70749/ijbr.v3i5.1097.

[3] Shahid N, Kazmi T, Farhat S, Naqvi SZ, Ahmed H. A Decade of Perinatal Mortality in Pakistan: Systematic Review of Patterns and Challenges (2013–2022). Journal of Taibah University Medical Sciences. 2025 Apr; 20(2): 139-50. doi: 10.1016/j.jtumed.2025.02.008.

[4] Ghafoor M, Qureshi QI, Soomro S, Shah F, Mughis A, Maqsood Z. Feto-Maternal Outcomes of Labouring Patients in Booked and Unbooked Patients: Feto-Maternal Outcomes of Laboring Patients. Pakistan Journal of Health Sciences. 2022 Nov: 83-7. doi: 10.54393/pjhs.v3i06.291.

[5] Ajmal H, Said S, Said A, Rahim R. Perinatal Mortality in Booked and Un-Booked Pakistani Mothers. Journal of Medical Sciences. 2022 Mar; 30(01): 68-70. doi: 10.52764/jms.22.30.1.14.

[6] Baloch S, Ahuja KB, Siddique SM, Sahito RM, Shams N, Jan MM. A Study of Maternal Outcome of Booked and Unbooked Cases. Pakistan Journal of Medical and Health Sciences. 2023; 17(4): 714–6. doi: 10.53350/pjmhs2023174714.

[7] Okojie OH, Ogboghodo EO, Omoijuanfo EA. Maternal and Neonatal Outcomes of Booked and UN-Booked Pregnancies in Benin City, Southern Nigeria: A Comparative Study. Journal of Community Medicine

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DOI: https://doi.org/10.54393/pjhs.v7i9.3864

and Primary Health Care. 2022 Aug; 34(2): 109-27. doi: 10.4314/jcmphc.v34i2.8.

[8] Rouzi A, Sahly N, Kafy AM, Alamoudi RA, Abualsaud RM, Alsheri WA *et al.* Mortality Outcomes Between Pregnant Women Booked for Antenatal Care and Unbooked Pregnant Women. Annals of Saudi Medicine. 2023 Nov; 43(6): 357-63. doi: 10.5144/0256-4947.2023.357.

[9] Ugwu AO, Adebayo A, Adefemi AK. A Comparative Study of Fetal and Maternal Outcomes in Booked and Unbooked Mothers Delivering at a Tertiary Health Care Institute in Lagos: A Retrospective Cohort Study. Saudi Journal of Medicine. 2024; 9(11): 507-511. doi: 10.36348/sjm.2024.v09i11.005.

[10] Almarri SS, Alzahrani YA, Alsudais MS, Bamehrez M, Alotaibi RK, Almalki BS *et al.* The Effects of Booking Status on the Outcome of Infants of ≥ 32 Weeks Gestational Age Admitted to the Neonatal Intensive Care Unit in a Tertiary Academic Center. Cureus. 2022 Nov; 14(11). doi: 10.7759/cureus.31020.

[11] Shukla VV and Carlo WA. Review of the Evidence for Interventions to Reduce Perinatal Mortality in Low- and Middle-Income Countries. International Journal of Pediatrics and Adolescent Medicine. 2020 Mar; 7(1): 4-10. doi: 10.1016/j.ijpam.2020.02.004.

[12] Bhardwaj R, Agrawal U, Vashist P, Manna S. Determination of Sample Size for Various Study Designs in Medical Research: A Practical Primer. Journal of Family Medicine and Primary Care. 2024 Jul; 13(7): 2555-61. doi: 10.4103/jfmpc.jfmpc_1675_23.

[13] Ashraf V, Momina SB, Shahid S. Comparison of Maternal and Fetal Complications in Booked and Unbooked Mothers Presenting in the Third Trimester. Pakistan Armed Forces Medical Journal. 2022 May; 72: S324.

[14] Anyigor-Ogah CS, Egede JO, Ogeh CO, Agunanne CC, Ozioko AI, Duru CC. Determinants and Outcomes of Pregnancies among Booked versus Unbooked Patients in a Tertiary Hospital in South East, Nigeria. Open Journal of Obstetrics and Gynecology. 2024 Jan; 14(1): 144-61. doi: 10.4236/ojog.2024.141014.

[15] Gaikwad V, Bhadoriya A, Gaikwad S, Gaikwad SV. A Comparative Study of Fetal and Maternal Outcomes in Registered and Unregistered Antenatal Cases in a Tertiary Care Center. Cureus. 2024 Aug; 16(8). doi: 10.7759/cureus.66066.

[16] Khan M and Naseeb S. Perinatal Mortality and Its Causes at Jinnah Postgraduate Medical Center, Karachi. Biological and Clinical Sciences Research Journal. 2025; 6(5). doi: 10.54112/bcsrj.v6i5.1700.

[17] Khan W, Khan M, Manzoor S, Bashir M, Qazi U, Malik A *et al.* Comparison of Pregnant Ladies with and without Antenatal Care Booking and its Effect on Maternal and Fetal Outcomes. Journal of Women's Medical and Dental College. 2024 Dec; 2(4). doi: 10.56600/jwmdc.v2i4.92.

[18] Khan UI, Uzma S, Shaheen Z, Ghaffar S, Mumtaz F, Jabeen SS. Assessment of the Characteristics and Clinical Outcomes of Un-Booked Obstetric Patients at Tertiary Care Hospital of Southern Punjab: Clinical Outcomes of Un-Booked Obstetric Patients at Southern Punjab Hospital. Pakistan Journal of Health Sciences. 2024 Dec: 275-81. doi: 10.54393/pjhs.v5i12.1834.

[19] Aftab S, Memon M, Ashraf M, Hashmi IB, Simrun, Firdous A: Maternal and Fetal Outcomes in Booked versus Unbooked Pregnancies: Evidence from a Tertiary Care Hospital in Pakistan. Pakistan Journal of Medical and Health Science. 2023; 17(12): 601-603. doi: 10.53350/pjmhs020231712601.

[20] Khan A, Hamid S, Reza TE, Hanif K, Emmanuel F. Assessment of Effective Coverage of Antenatal Care and Associated Factors in Squatter Settlements of Islamabad Capital Territory, Pakistan: An Analytical Cross-Sectional Study. Cureus. 2022 Aug; 14(8). doi: 10.7759/cureus.28454.

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