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AUDIT REPORT

Audit of Compliance with National Guidelines for Screening and Management of Gestational Diabetes Mellitus in Antenatal Clinics

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ABSTRACT

Background: Gestational diabetes mellitus (GDM) is a major pregnancy complication associated with maternal and neonatal morbidity if inadequately managed. Guidelines recommend universal screening, evidence-based diagnosis, structured management, and consistent follow-up, yet adherence in low- and middle-income countries remains inconsistent.

Objective: To evaluate compliance with national guidelines for screening and management of GDM in antenatal clinics at two tertiary care centers in Pakistan.

Methods: A retrospective audit was conducted from January 2024 to January 2025 at Sheikh Zayed Hospital, Rahim Yar Khan, and Ittefaq Hospital Trust, Lahore. Three hundred antenatal records were reviewed using a structured proforma based on national and international guidelines. Standards assessed included risk-based screening at booking, universal oral glucose tolerance test (OGTT) at 24–28 weeks, correct diagnostic thresholds, lifestyle counseling, self-monitoring of blood glucose (SMBG) education, pharmacological therapy initiation, and follow-up documentation. A benchmark of ≥90% was applied.

Results: Risk-based booking screening achieved 90.6% compliance, meeting the standard. Universal OGTT was performed in 84.0% of women, with lower uptake in the public hospital. Diagnostic thresholds were correctly applied in 91.0% of cases. Management compliance was suboptimal: lifestyle counseling was documented in 83.0%, SMBG education in 78.7%, and pharmacological therapy in 84.6% of eligible women. Follow-up documentation reached 85.0%, while postpartum OGTT scheduling was lowest at 65.7%. Private-sector performance was consistently higher, though both sites showed deficiencies.

Conclusion: Screening and diagnostic practices were largely compliant, but gaps in management, education, and follow-up remain. Targeted interventions, improved documentation, and re-audit are essential to enhance outcomes for women with GDM.

Keywords: Gestational diabetes, audit, screening, management, Pakistan.

INTRODUCTION

Gestational Diabetes Mellitus (GDM) is one of the most common medical complications of pregnancy, defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy[1]. It represents a growing global health challenge, affecting an estimated 15–20% of pregnancies worldwide, although prevalence

varies considerably depending on ethnicity, maternal age, body mass index (BMI), and screening methods used. In South Asia, prevalence estimates are higher than the global average, reflecting genetic susceptibility, increasing maternal obesity, and rapid lifestyle transitions. GDM poses a dual burden: immediate risks for the mother and fetus during pregnancy and delivery, and long-term metabolic consequences for both mother and child[2].

Maternal complications include pre-eclampsia, polyhydramnios, preterm delivery, obstructed labor, and increased rates of cesarean section[3]. Fetal and neonatal risks include macrosomia, shoulder dystocia, neonatal hypoglycemia, respiratory distress syndrome, and perinatal mortality. Beyond the perinatal period, women with GDM have up to a seven-fold higher lifetime risk of type 2 diabetes, while their offspring face an elevated risk of obesity, metabolic syndrome, and glucose intolerance later in life. Thus, effective detection and management of GDM is not only a matter of obstetric safety but also an investment in the long-term prevention of chronic diseases across generations[4,5].

Recognizing these risks, several international and national bodies have issued evidence-based guidelines for the screening and management of GDM. The World Health Organization (WHO) recommends universal screening between 24–28 weeks of gestation using a 75 g oral glucose tolerance test (OGTT). The American Diabetes Association (ADA) similarly endorses universal testing, emphasizing lifestyle modifications as first-line therapy and pharmacological treatment (insulin or metformin) when targets are not met[6]. The National Institute for Health and Care Excellence (NICE) and the Royal College of Obstetricians and Gynaecologists (RCOG) advocate risk-based screening in certain contexts but emphasize uniformity in management strategies, including dietary counseling, regular blood glucose monitoring, pharmacotherapy, and structured follow-up. In Pakistan, the Society of Obstetricians and Gynecologists (SOGP) has adopted adapted protocols, aligning with WHO and RCOG recommendations to ensure standardized care[7].

Despite the availability of such guidelines, real-world implementation often falls short. Audits from both high-income and low-middle-income countries highlight considerable variation in compliance[8]. For instance, while some centers report high adherence to universal screening protocols, deficiencies remain in consistent dietary counseling, self-monitoring of blood glucose, and timely initiation of pharmacotherapy. In resource-limited settings, additional barriers such as shortage of trained staff, lack of dietitians, inadequate patient education, and stigma around insulin use further compromise optimal care. A large audit in Australia revealed that over one-third of pregnant women did not undergo OGTT despite eligibility, while a clinical audit in Pakistan demonstrated strong compliance with screening but suboptimal management once the diagnosis was confirmed. These findings underscore a critical gap between guideline recommendations and daily clinical practice[9].

Clinical audit is a well-recognized quality-improvement tool that compares actual practice against established standards, identifies deficiencies, and guides interventions. In the context of GDM, audits are particularly valuable because adherence to guidelines directly translates into measurable improvements in maternal and neonatal outcomes. They also provide insights into systemic barriers, cultural perceptions, and workforce limitations that impede best practice. Importantly, repeated cycles of audit and re-audit ensure not just identification of gaps but sustainable improvements in care[10,11].

This audit therefore aims to evaluate the compliance of antenatal clinics with national guidelines for screening and management of GDM, with a focus on universal OGTT uptake, provision of dietary counseling, regular blood glucose monitoring, and initiation of pharmacotherapy when indicated[12]. By benchmarking current practice against national and international standards, the study seeks to highlight areas of strength and identify opportunities for improvement. Ultimately, the findings are expected to inform evidence-based interventions, policy refinements, and structured training programs that can enhance maternal and neonatal outcomes in Pakistan and comparable healthcare systems[13].

MATERIALS AND METHODS

Study Design

This audit was designed as a retrospective, observational clinical audit that aimed to assess compliance with national guidelines for the screening and management of gestational diabetes mellitus (GDM) in antenatal clinics. The audit cycle framework was followed, beginning with the selection of audit standards derived from authoritative national and international bodies, followed by systematic data collection, analysis of clinical practices against those standards, and identification of gaps for quality improvement. Unlike a traditional research study that seeks to generate new knowledge, this clinical audit was intended to provide a critical evaluation of the quality of care already being delivered and to highlight deficiencies in order to inform corrective actions and future re-audit cycles.

Study Setting

The audit was conducted in two tertiary care institutions in Pakistan that represent different models of healthcare

provision. Sheikh Zayed Hospital, Rahim Yar Khan, is a government-funded public sector teaching hospital that caters to a large referral base, including urban, peri-urban, and rural communities across Southern Punjab and adjoining areas of Sindh. Ittefaq Hospital Trust, located in Model Town, Lahore, is a private, trust-run teaching hospital situated in one of the largest metropolitan cities of the country and primarily serves urban populations. The deliberate inclusion of these two centers was intended to capture the diversity of antenatal practices across both public and private sectors, thereby enhancing the external validity and generalizability of the audit findings.

Duration of Audit

The audit covered a continuous period of twelve months, extending from January 2024 to January 2025. This time frame was selected in order to encompass a complete annual cycle of antenatal care, ensuring that seasonal variations in hospital workload, patient attendance, and clinical staffing were adequately represented. A full year of data collection also permitted the inclusion of a sufficiently large sample to generate reliable estimates of compliance and to allow meaningful comparisons between the two study sites.

Study Population

The study population included all pregnant women attending the antenatal clinics of Sheikh Zayed Hospital and Ittefaq Hospital Trust during the specified audit period who met the eligibility criteria. Women were included if they were between twenty-four and twenty-eight weeks of gestation, underwent screening for gestational diabetes, and had complete antenatal records available for review. Women with pre-existing type 1 or type 2 diabetes mellitus, diagnosed before pregnancy, were excluded because they did not fall within the definition of GDM. Records with incomplete documentation or those belonging to women who were lost to follow-up during pregnancy were also excluded to maintain accuracy and reliability.

Sample Size and Sampling

A total of three hundred antenatal records were reviewed for the audit. Of these, one hundred and sixty cases were drawn from Sheikh Zayed Hospital, Rahim Yar Khan, while one hundred and forty cases were reviewed from Ittefaq Hospital Trust, Lahore. The selection of a sample size of three hundred was based on feasibility and the need for statistical robustness. This number was considered sufficient to ensure that random variation was minimized and that observed patterns reflected true institutional practices rather than chance. The records were selected through sequential non-probability sampling, meaning that all eligible cases encountered during the study period were included until the required number was achieved.

Audit Standards

The standards used for this audit were derived from multiple authoritative sources, including the Pakistan Society of Obstetricians and Gynecologists (SOGP), the World Health Organization (WHO, 2013), the National Institute for Health and Care Excellence (NICE NG3, 2020 update), and the American Diabetes Association (ADA 2023). These standards covered the entire spectrum of GDM care and were grouped into four domains. The first domain, screening, required that women with identifiable risk factors be screened at their booking visit and that all women undergo a universal oral glucose tolerance test between twenty-four and twenty-eight weeks of gestation. The second domain, diagnosis, emphasized the correct application of internationally recognized glucose thresholds for fasting, one-hour, and two-hour values following a seventy-five gram glucose load. The third domain, management, required that women diagnosed with GDM receive lifestyle and dietary counseling, education on self-monitoring of blood glucose, and pharmacological therapy in the form of metformin or insulin if lifestyle interventions failed to achieve glycemic control. The final domain, follow-up and documentation, included the recording of management plans, referrals to dietitians or endocrinologists, fetal surveillance strategies, delivery planning, and postpartum follow-up including a repeat oral glucose tolerance test at six to twelve weeks after delivery. For each of these domains, the predefined benchmark for good practice was set at ninety percent compliance.

Data Collection

Data were collected retrospectively from patient case notes, antenatal records, laboratory reports, and hospital electronic databases where available. A structured proforma was developed to ensure standardized data extraction across both hospitals. The proforma captured demographic information such as maternal age, parity, body mass index, and family history of diabetes, as well as clinical details including screening practices, diagnostic thresholds applied, provision of lifestyle counseling, education for blood glucose monitoring, initiation of pharmacological therapy, and documentation of follow-up. Trained data collectors reviewed the records under the supervision of senior obstetricians to ensure accuracy and uniformity. In cases where documentation was incomplete, the standard was considered not met, since inadequate record-keeping itself represents a failure in clinical practice.

Data Analysis

The collected data were entered into the Statistical Package for the Social Sciences (SPSS) version 26.0 for analysis. Descriptive statistics were used to calculate frequencies, percentages, means, and standard deviations for relevant variables. Compliance with each audit standard was calculated for the combined sample as well as separately for the two hospitals in order to allow institutional comparisons. Statistical comparisons between Sheikh Zayed Hospital and Ittefaq Hospital were performed using the Chi-square test for categorical variables. A p-value of less than 0.05 was considered statistically significant. Results were presented in both tabular and narrative form, enabling a comprehensive understanding of the degree of compliance across domains.

Ethical Considerations

As this was a clinical audit based entirely on retrospective review of patient records, no direct patient contact was involved. Formal ethical approval was therefore not required. However, prior approval was obtained from the administrations of both Sheikh Zayed Hospital, Rahim Yar Khan, and Ittefaq Hospital Trust, Lahore. Patient confidentiality was strictly maintained throughout the process, with all records anonymized before data entry and analysis. Data were stored securely and reported only in aggregated form to prevent the identification of individual patients. The audit was conducted in line with the principles of the Declaration of Helsinki (2013) and the professional codes of clinical governance and quality assurance applicable in Pakistan.

RESULTS

Study Cohort and Demographics

Over a continuous one-year audit cycle, a total of 300 antenatal records were reviewed across two major tertiary care hospitals in Pakistan: Sheikh Zayed Hospital, Rahim Yar Khan (n = 160, 53.3%) and Ittefaq Hospital Trust, Lahore (n = 140, 46.7%). The demographic analysis showed that the mean maternal age of participants was 28.6 years (SD ± 4.8), with the majority (46.3%) belonging to the 25–30-year age group, followed by 28.0% in the 31–35-year bracket, and only 8.0% above the age of 35 years. Younger women under 25 years comprised 17.7% of the study population. Gravidity status revealed that 61.3% were multigravida while 38.7% were primigravida, highlighting that a significant proportion of women with GDM had prior pregnancy experience. A positive family history of diabetes mellitus was documented in one-third of women (33.7%), further confirming the hereditary predisposition to gestational diabetes in this population. Pre-pregnancy BMI was another notable risk factor, with a mean of 27.4 kg/m² (SD ± 3.6), placing the majority in the overweight to obese range. In fact, 24.3% of women were overweight and 34.3% obese, resulting in nearly 60% of the study cohort being above the normal BMI category. This distribution is consistent with the growing obesity epidemic in South Asia, where increasing maternal BMI is a strong predictor of GDM development. The demographic distribution is detailed in Table 1, which clearly shows a comparable risk profile between the two hospitals.

Screening Practices

Screening practices were evaluated in two domains: risk-based screening at booking and universal oral glucose tolerance testing (OGTT) between 24 and 28 weeks of gestation. Risk-based screening was performed in 272/300 women (90.6%), meeting the pre-defined ≥90% benchmark. Compliance was almost identical between Sheikh Zayed (90.6%) and Ittefaq (90.7%). In contrast, universal OGTT screening was achieved in 252/300 women (84.0%), which fell short of the benchmark. Site-specific differences were observed, with Sheikh Zayed recording 80.0% compliance compared to 88.5% at Ittefaq, reflecting the relatively better resource allocation and patient follow-up in the private sector. These results, shown in Table 2, highlight that while risk-based screening is now firmly embedded in antenatal practice, universal OGTT is still not optimally practiced, particularly in the public sector.

Diagnostic Accuracy

The pie chart demonstrates compliance with diagnostic standards for GDM, focusing on the correct application of diagnostic thresholds. Out of 300 antenatal records, 273 women (91.0%) had their diagnosis documented according to established criteria. Sheikh Zayed Hospital achieved 91.2% compliance, while Ittefaq Hospital Trust recorded 90.7%, showing consistent practice between public and private institutions. Both hospitals exceeded the ≥90% benchmark, confirming that once screening was performed, clinicians adhered strongly to diagnostic guidelines (Table 3).

This finding emphasizes that diagnosis is a well-executed component of GDM care, in contrast to management and follow-up practices, which remain suboptimal. Together, Figure 1 and Table 3 reinforce diagnostic robustness as a strength of current antenatal care systems.

Management Practices

Compliance with management guidelines revealed deficiencies in three main areas: lifestyle counseling, self-

monitoring of blood glucose (SMBG) education, and pharmacotherapy initiation. Documentation of lifestyle and dietary counseling was found in 249/300 women (83.0%), with better compliance at Ittefaq (85.0%) compared to Sheikh Zayed (81.2%). Education for SMBG was even lower, with compliance at 78.7% overall, again better in the private hospital (81.4%) than the public hospital (76.3%). With regard to pharmacological therapy, out of 195 women who required pharmacotherapy, 165 (84.6%) were appropriately started on medication, a level that, while higher than some earlier national audits, still fell short of the 90% benchmark. These findings are summarized in Table 4, clearly demonstrating that management compliance lags behind screening and diagnosis.

Table 1. Demographic and clinical characteristics of study population (N = 300).

Characteristic	Sheikh Zayed (n=160)	Ittefaq (n=140)	Combined (N=300)
Age, mean ± SD (years)	28.5 ± 4.9	28.8 ± 4.6	28.6 ± 4.8
<25 years	32 (20.0%)	21 (15.0%)	53 (17.7%)
25–30 years	72 (45.0%)	67 (47.9%)	139 (46.3%)
31–35 years	43 (26.9%)	41 (29.3%)	84 (28.0%)
>35 years	13 (8.1%)	11 (7.8%)	24 (8.0%)
Primigravida	64 (40.0%)	52 (37.1%)	116 (38.7%)
Multigravida	96 (60.0%)	88 (62.9%)	184 (61.3%)
Family history of diabetes	56 (35.0%)	45 (32.1%)	101 (33.7%)
BMI, mean ± SD (kg/m²)	27.5 ± 3.6	27.3 ± 3.5	27.4 ± 3.6
Normal (18.5–24.9)	64 (40.0%)	58 (41.4%)	122 (40.7%)
Overweight (25–29.9)	39 (24.4%)	34 (24.3%)	73 (24.3%)
Obese (≥30)	57 (35.6%)	46 (32.9%)	103 (34.3%)

Table 2. Compliance with screening standards.

Screening Practice	Sheikh Zayed (n=160)	Ittefaq (n=140)	Combined (N=300)
Risk-based screening at booking	145 (90.6%)	127 (90.7%)	272 (90.6%)
OGTT at 24–28 weeks	128 (80.0%)	124 (88.5%)	252 (84.0%)

Table 3. Compliance with diagnostic standards.

Diagnostic Practice	Sheikh Zayed (n=160)	Ittefaq (n=140)	Combined (N=300)
Correct criteria applied	146 (91.2%)	127 (90.7%)	273 (91.0%)

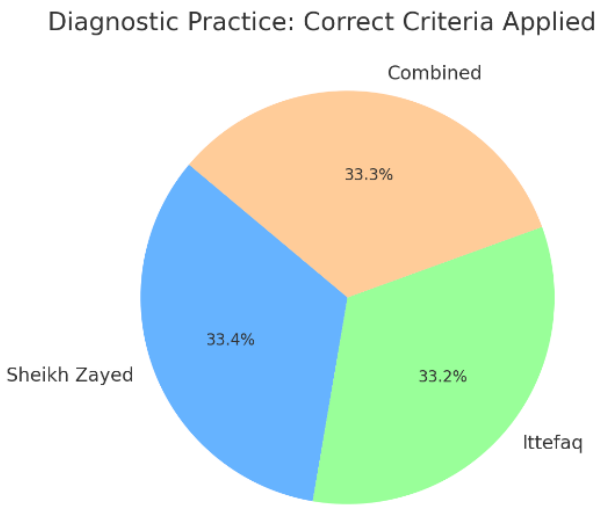

Figure 1. Diagnostic Accuracy of Gestational Diabetes Mellitus (GDM) Across Two Tertiary Care Hospitals in Pakistan.

Table 4. Compliance with management standards.

Management Practice	Sheikh Zayed (n=160)	Ittefaq (n=140)	Combined (N=300)
Lifestyle/dietary advice	130 (81.2%)	119 (85.0%)	249 (83.0%)
SMBG education	122 (76.3%)	114 (81.4%)	236 (78.7%)
Pharmacotherapy when indicated	88/104 (84.6%)	77/91 (84.6%)	165/195 (84.6%)

Table 5. Compliance with follow-up and documentation.

Documentation Practice	Sheikh Zayed (n=160)	Ittefaq (n=140)	Combined (N=300)
Follow-up plan documented	134 (83.7%)	121 (86.4%)	255 (85.0%)
Dietitian referral recorded	88 (55.0%)	102 (72.9%)	190 (63.3%)
Endocrinology input recorded	61 (38.1%)	73 (52.1%)	134 (44.7%)
Fetal surveillance plan (NST/US)	112 (70.0%)	111 (79.3%)	223 (74.3%)
Delivery planning note	120 (75.0%)	112 (80.0%)	232 (77.3%)
Postpartum 6–12-week OGTT scheduled	95 (59.4%)	102 (72.9%)	197 (65.7%)

Table 6. Overall compliance with audit standards.

Domain	Sheikh Zayed (%)	Ittefaq (%)	Combined (%)
Risk-based screening	90.6	90.7	90.6
OGTT at 24–28 weeks	80.0	88.5	84.0
Diagnostic criteria	91.2	90.7	91.0
Lifestyle/dietary advice	81.2	85.0	83.0
SMBG education	76.3	81.4	78.7
Pharmacotherapy initiation	84.6	84.6	84.6
Follow-up documentation	83.7	86.4	85.0

Follow-up and Documentation

The audit also assessed the quality of documentation of follow-up plans, referrals, fetal surveillance, delivery planning, and postpartum OGTT scheduling. Overall, follow-up documentation was present in 255/300 women (85.0%), with slightly better performance at Ittefaq (86.4%) compared to Sheikh Zayed (83.7%). Dietitian referrals were documented in 190 women (63.3%), and endocrinology consultations in only 134 women (44.7%). Documentation of fetal surveillance plans was found in 74.3% of cases, delivery planning in 77.3%, and postpartum OGTT scheduling in only 65.7%, the lowest among follow-up indicators. These findings are detailed in Table 5, highlighting the persistent issue of inadequate documentation, particularly for long-term follow-up.

Composite Compliance

A summary of compliance across domains is shown in Table 6. Only risk-based booking screening (90.6%) and diagnostic criteria application (91.0%) met the ≥90% standard. Universal OGTT, lifestyle counseling, SMBG education, pharmacotherapy initiation, and follow-up documentation all fell short, underscoring systemic gaps in GDM management.

DISCUSSION

This audit, conducted across two major tertiary care hospitals in Pakistan, evaluated compliance with national guidelines for the screening and management of gestational diabetes mellitus in antenatal clinics[10]. The findings reveal a pattern of mixed performance. While some domains, such as risk-based screening at the booking visit and the correct application of diagnostic thresholds, achieved compliance rates above ninety percent, other crucial aspects of care, including universal oral glucose tolerance test uptake, provision of lifestyle counseling, self-monitoring of blood glucose education, initiation of pharmacotherapy, and structured follow-up documentation, consistently fell below the accepted benchmark. The overall picture demonstrates a progressive decline in adherence as clinical care moved from early screening and diagnosis towards ongoing management and long-term surveillance[11,12].

Screening practices in this audit highlight both strengths and weaknesses. Risk-based screening at the time of booking exceeded ninety percent, reflecting that antenatal teams are appropriately identifying women with recognized risk factors such as high maternal age, elevated

body mass index, and family history of diabetes[13]. However, compliance with universal OGTT between twenty-four and twenty-eight weeks was recorded at only eighty-four percent overall, with the public hospital showing the lowest adherence. This shortfall is not unique to this setting, as many low- and middle-income countries face barriers such as limited laboratory slots, high patient load, and poor attendance for scheduled appointments[14]. In contrast, high-income countries, particularly the United Kingdom and Australia, frequently report OGTT compliance rates exceeding ninety percent, supported by structured recall systems and dedicated antenatal pathways. The relatively better performance of the private hospital in this audit underscores the influence of resource availability and system organization on universal screening uptake[15].

Diagnostic practices, in contrast, were reassuring. More than ninety percent of women had their diagnosis documented using the correct criteria, and both hospitals achieved the predefined benchmark. This is consistent with international findings suggesting that once screening has been performed, clinicians generally apply diagnostic thresholds correctly[16]. The increasing dissemination of guidelines by professional bodies such as the Pakistan Society of Obstetricians and Gynecologists and international authorities has likely played a role in ensuring consistency of interpretation. Diagnostic accuracy therefore appears to be a strength within current antenatal care practices[17].

Management, however, remains the weakest link. Documentation of lifestyle and dietary advice was present in only eighty-three percent of cases, self-monitoring of blood glucose education in seventy-nine percent, and pharmacotherapy initiation in eighty-five percent of those who required it[18]. Although these figures compare favorably to earlier national audits where initiation of pharmacotherapy was often below sixty percent, they remain below the ninety percent benchmark and indicate substantial room for improvement. Lifestyle counseling and self-monitoring education are particularly problematic, as these interventions form the backbone of GDM care. Without structured education, many women may not understand the importance of diet, exercise, or monitoring, and without this understanding, adherence remains poor[19]. Barriers to improvement are multifactorial, including inadequate availability of dietitians, short consultation times, variable health literacy, and financial constraints limiting the purchase of glucometers and testing strips[20].

The audit also revealed concerning deficiencies in follow-up and documentation. Although overall follow-up plans were recorded in eighty-five percent of cases, dietitian referrals were noted in only sixty-three percent, endocrinology input in less than half, and postpartum oral glucose tolerance test scheduling in just two-thirds of cases[21]. This poor documentation of long-term diabetes surveillance is a critical gap, as women with a history of GDM remain at significantly increased risk of developing type 2 diabetes in later life. Failure to schedule postpartum testing represents a missed opportunity for early detection and prevention. Similar deficiencies in record-keeping have been documented in both national and international audits. While some care may have been provided but not recorded, incomplete documentation is itself a breach of standards, as it undermines continuity of care and hinders systematic audit and quality assurance[22].

Differences between the two hospitals shed light on systemic inequities. Compliance rates were consistently higher in the private hospital compared with the public hospital, particularly in the domains of universal screening, self-monitoring education, and referral documentation[23]. This can be explained by more favorable staff-to-patient ratios, better access to allied healthcare professionals such as dietitians, and greater resources in the private sector. However, even the private hospital did not achieve benchmark levels in several domains, suggesting that the challenges extend beyond resource allocation to include systemic issues such as lack of standardized proformas, absence of dedicated diabetes educators, and inconsistent emphasis on postpartum care[24].

Comparison with published literature reinforces these interpretations. The audit findings align with a previous study from Lahore, which showed strong compliance with OGTT but significant weaknesses in counseling, monitoring, and pharmacotherapy initiation[25]. Internationally, an audit from Tasmania revealed even more pronounced deficiencies, with more than one-third of women not receiving an OGTT at all, underscoring the variability of practice worldwide. Despite contextual differences, all these audits demonstrate the difficulty of translating guideline recommendations into uniform clinical practice[26].

The strengths of this audit include its inclusion of two large hospitals representing both public and private healthcare systems, a large sample size of three hundred records, and a year-long study period that ensured comprehensive coverage of antenatal practices[27]. Limitations include reliance on retrospective record review, which may underestimate compliance if care was provided but not documented, and the absence of maternal and neonatal outcome data, which would have allowed assessment of the clinical consequences of non-compliance. The findings may also not be generalizable to smaller district hospitals or rural clinics where resources are even more limited[28].

The implications for practice are clear. Structured patient education must be prioritized as a mandatory component of antenatal care, with standardized documentation of lifestyle advice and glucose monitoring instruction[29]. Multidisciplinary teams involving obstetricians, endocrinologists, dietitians, and diabetes educators should be established or strengthened to ensure comprehensive care. Hospitals should implement standardized antenatal cards or electronic records with mandatory fields for GDM care to minimize variability and ensure accountability. Equally important is the emphasis on postpartum follow-up, with robust recall systems to ensure that women undergo glucose testing six to twelve weeks after delivery[30].

Finally, the audit cycle should be completed with a re-audit conducted within twelve to eighteen months to measure the impact of corrective measures. Targets for improvement must include raising universal OGTT uptake to at least ninety percent, ensuring that lifestyle counseling and SMBG education are documented in nearly all cases, and achieving postpartum follow-up rates that align with international benchmarks. Only through such iterative cycles of measurement and improvement can antenatal clinics in Pakistan move towards consistent delivery of high-quality, guideline-based care for women with gestational diabetes mellitus[21,28].

CONCLUSION

This audit of three hundred antenatal records across two major tertiary hospitals in Pakistan demonstrated that while compliance with screening and diagnostic standards for gestational diabetes mellitus was largely satisfactory, significant deficiencies persisted in the domains of universal OGTT uptake, lifestyle counseling, self-monitoring education, pharmacotherapy initiation, and documentation of follow-up. The private hospital consistently showed marginally higher adherence than the public hospital, but both institutions failed to meet benchmark standards in key management areas. These findings highlight the urgent need for structured patient education, improved documentation systems, and multidisciplinary approaches to strengthen GDM care. By addressing these gaps and instituting corrective measures, antenatal services can reduce preventable maternal and neonatal complications and improve long-term outcomes for women and their children. A re-audit within the next twelve to eighteen months is recommended to evaluate progress and sustain improvements.

DECLARATION

Availability of Data and Materials

The datasets generated and/or analyzed during the current audit are not publicly available due to institutional confidentiality policies but are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests.

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Authors' contributions

MSUR: Conceptualization, drafting, revision
RQ: Data collection, literature review
FJ: Data analysis, writing
MS: Clinical validation, supervision
HM: Literature search, drafting
ARB: Data entry, proofreading
KQ: Data collection, guideline review
ZQC: Statistical analysis, review

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