

ORIGINAL RESEARCH ARTICLE

Quality of maternal healthcare services in public health facilities of Addis Ababa: Documentation, prenatal and postnatal care, and key determinants of service delivery

DOI: 10.29063/ajrh2025/v29i8.2

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Abstract

This study assesses the quality of maternal healthcare services in Addis Ababa, Ethiopia, focusing on documentation practices, prenatal and postnatal care, and factors influencing high-quality services. A review of 354 maternity medical records from five public hospitals and ten public health centers evaluated the completeness and consistency of maternal healthcare documentation, including patient identification, prenatal care, and postnatal care services. The findings revealed gaps in prenatal care documentation, particularly in maternal medical history, risk factors, and continuity of care. While strengths were noted in patient identification and prenatal screening, challenges remain in adhering to clinical-guidelines and ensuring continuity, especially in postnatal services. Factors such as women's education, use of electronic medical records, obstetric assessments, and adherence to clinical-guidelines significantly influenced the quality of care. The study highlights the need for improved documentation practices, enhanced provider training, and better-adherence to clinical-standards to improve maternal healthcare outcomes in Addis Ababa. (*Afr J Reprod Health 2025; 29 [8]: 15-29*).

Keywords: Addis Ababa; Health care documentation; Maternal health care quality; Prenatal care; Postnatal service

Résumé

Cette étude évalue la qualité des services de santé maternelle à Addis-Abeba, en Éthiopie, en se concentrant sur les pratiques de documentation, les soins prénatals et postnatals, et les facteurs influençant la qualité des services. L'examen de 354 dossiers médicaux de maternité provenant de cinq hôpitaux publics et de dix centres de santé publics a évalué l'exhaustivité et la cohérence de la documentation des soins maternels, notamment l'identification des patientes, les soins prénatals et postnatals. Les résultats ont révélé des lacunes dans la documentation des soins prénatals, notamment concernant les antécédents médicaux maternels, les facteurs de risque et la continuité des soins. Si des points forts ont été constatés en matière d'identification des patientes et de dépistage prénatal, des difficultés subsistent quant au respect des recommandations cliniques et à la continuité des soins, notamment en matière de services postnatals. Des facteurs tels que l'éducation des femmes, l'utilisation des dossiers médicaux électroniques, les évaluations obstétricales et le respect des recommandations cliniques ont significativement influencé la qualité des soins. L'étude souligne la nécessité d'améliorer les pratiques de documentation, la formation des prestataires et le respect des normes cliniques afin d'améliorer les résultats des soins maternels à Addis-Abeba. (*Afr J Reprod Health 2025; 29 [8]: 15-29*).

Mots-clés: : Addis-Abeba; Documentation des soins de santé; Qualité des soins de santé maternelle; Soins prénatals; Service

Introduction

Maternal mortality and morbidity remain persistent global health challenges, with sub-Saharan Africa bearing the highest burden. The World Health Organization (WHO) estimates that approximately 295,000 maternal deaths occurred worldwide in 2017, with sub-Saharan Africa accounting for nearly two-thirds of these deaths¹. Although maternal

mortality has decreased globally in the past few decades, the situation remains dire in many low-income countries, including Ethiopia. The country has made strides in expanding access to maternal healthcare services; however, maternal mortality continues to be alarmingly high. In 2017, Ethiopia's maternal mortality ratio (MMR) was estimated at 401 deaths per 100,000 live births, far above the global average of 211 per 100,000 live births². This

disparity emphasizes the need for not only increased access but also high-quality maternal healthcare services to reduce these preventable deaths and improve overall maternal and newborn health outcomes.

The relationship between the quality of care received and maternal health outcomes is well-documented. High-quality maternal healthcare—defined by the timely provision of evidence-based care across the pregnancy continuum, from prenatal to postnatal stages—has been shown to significantly reduce maternal morbidity and mortality. Key elements of quality care include skilled attendance at birth, access to emergency obstetric care, and adequate postnatal care³. Globally, improving the quality of maternal care has become a priority, as poor-quality care exacerbates the risks of complications and mortality. For instance, studies have shown that substandard care, such as delays in receiving appropriate treatment or poor communication between healthcare providers and patients, increases the likelihood of adverse outcomes such as maternal hemorrhage and infection⁴.

In Ethiopia, despite significant improvements in maternal healthcare access, challenges persist regarding the quality of care provided. Efforts such as the introduction of free maternity services have increased facility-based deliveries, but the quality of care in these settings remains a critical issue. The Ethiopian government has implemented several initiatives, such as the Health Extension Program (HEP), which brings essential maternal healthcare services to rural communities⁵. Additionally, the establishment of the National Quality Standards (NQS) framework in 2016 seeks to guide healthcare providers in improving service delivery across all levels of care⁶. However, barriers to achieving high-quality care persist, including shortages of skilled healthcare providers, limited access to essential medical supplies, inadequate infrastructure, and poorly maintained equipment⁷. Furthermore, research has highlighted gaps in healthcare providers' knowledge and skills, particularly regarding evidence-based practices for maternal care, which can undermine service quality and patient safety⁸.

One of the critical challenges is the insufficient linkage between maternal healthcare quality and health outcomes at the facility level. Studies have found that despite the availability of healthcare services, the utilization of these services and the quality of care provided remain suboptimal⁹. For instance, many Ethiopian women do not receive timely or appropriate interventions during obstetric emergencies, which contributes to high rates of maternal morbidity and mortality¹⁰. Furthermore, the quality of care often varies widely across different healthcare facilities, with factors such as staffing levels, training, and infrastructure quality playing a significant role in shaping patient experiences and outcomes.

In response to these challenges, the Ethiopian government has prioritized improving emergency obstetric and newborn care (EmOC) services in public health facilities, ensuring that healthcare providers are adequately trained to handle complex maternal and newborn complications. Additionally, the promotion of family planning and increased access to modern contraceptive methods are essential components of efforts to prevent unintended pregnancies and reduce the risks associated with childbirth¹¹. Despite these advancements, there is a need for a more nuanced understanding of the factors influencing the quality of maternal healthcare services at the facility level, particularly in Addis Ababa, where urbanization and population density may present unique challenges.

This study aims to address this gap by examining the quality of maternal healthcare services provided at public health facilities in Addis Ababa and identifying the key factors that affect service quality. By investigating these factors, the research aims to contribute to the development of targeted interventions that can improve maternal healthcare services, ultimately leading to better health outcomes for mothers and newborns in Ethiopia.

Study objectives

This study was aimed to assess quality of maternal health services and influencing factors affecting their quality in public health facilities, in Addis Ababa, Ethiopia.

Specific objectives

To assess the quality of maternal healthcare services in Addis Ababa

To identify factors influencing the quality of maternal healthcare services in public health facilities in Addis Ababa

Methods

Setting and period

The study was carried out from 31st August 2023, to 13th December 2023, in Addis Ababa, the capital city of Ethiopia, encompassing 11 sub-cities. With 1,389,817 males and 1,527,478 females, the estimated total population of the city is 3,854,863, with an estimated area of 526.99 square kilometres and an estimated density of 5,535.8 persons per square kilometre. The city was divided administratively into 120 districts and 11 sub-cities. Ethiopia's three-tiered healthcare system is part of its infrastructure. There were 13 public hospitals (seven of which are run by the federal government), 101 health centres, 42 private hospitals, and 1389 private different level clinics, according to the FMOH's 2021 Health and Health Related Indicators¹¹.

Study design

A quantitative, cross-sectional study design was utilized to assess the quality of maternal health services by reviewing medical records of women who attended antenatal care (ANC), delivery, and postnatal care (PNC) services in five public hospitals and ten public health centres from January 1, 2020, to December 31, 2022. The data collection focused on evaluating the completeness, accuracy, and quality of documented maternal care across the continuum of care, including prenatal, delivery, and postnatal services. This design allows for a snapshot of the status of maternal healthcare in Addis Ababa's public health facilities over the specified time period.

Study population and sampling strategy

The facilities were selected using probability sampling with a simple random sampling method. To ensure a representative selection of health

facilities, two lottery boxes were used: one containing names of hospitals and the other containing names of health centers. Five hospitals and ten health centers were randomly selected to participate in the study. In total, 354 maternal medical records were reviewed, with an equal representation from each selected facility.

The sample size was determined using the Taro Yamane formula, which estimates sample sizes for finite populations. Given the variability in maternal service quality across different categories (70% for ANC¹²; 26.2% for delivery¹³; and P = 85%¹²), the study ensured adequate representation from all service types, with an additional 10% non-response rate to enhance reliability. A systematic random sampling technique was applied to select the individual records from the patient logs, ensuring that each record had an equal chance of being included. Only complete and legible records were included in the analysis.

$$n (\text{ANC/Delivery/PNC}) = \frac{Z_{\alpha/2} (P (1-P))}{d^2}$$

d^2

The review focused on records of women who attended ANC, delivery, and PNC services. The maternity records were categorized into three types of care: ANC, delivery, and PNC. The study specifically aimed to assess the completeness of documentation across these services. The eligibility criterion for record inclusion was that the medical records must contain complete documentation for all three services—ANC, delivery, and PNC. Records that lacked any part of the necessary documentation were excluded.

The sampling frame consisted of the medical records of women who attended the selected health facilities, with each facility's patient logs used as the basis for selection. Stratified proportional allocation was employed to select records from each health facility according to the size of their patient population. To ensure equal probability of selection, systematic random sampling was applied, with a random starting point and a fixed interval (every Kth record) for choosing the eligible records. This methodology ensured a balanced representation from all selected facilities, allowing for a comprehensive assessment of maternal healthcare across the study sites.

Data collection

The data collection process involved reviewing medical records using a structured checklist, which was adapted from well-established instruments such as the Demographic and Health Survey (DHS)¹⁴, the Service Provision Assessment (SPA)¹⁵, and the Service Availability and Readiness Assessment (SARA)¹⁶. The checklist covered key variables, including women's biographic data, frequency of ANC visits, delivery outcomes, prenatal illnesses, and postnatal care documentation.

In addition to the record review, a patient questionnaire was used to collect supplementary data directly from the patients who participated in the study. The questionnaire was developed to assess factors influencing the utilization and quality of maternal healthcare services, including socio-demographic information and patient satisfaction with the services received. To ensure the validity and reliability of the questionnaire, it was pretested on a 5% sample of the study population outside the study area. This pretest allowed the research team to refine the questions and ensure that they captured the relevant information effectively.

Data collection process

Data collection was conducted by a team of trained health workers, including obstetrics and gynecology residents and senior midwives. The data collectors underwent a two-day training session to ensure a clear understanding of the study objectives, the data collection tools, and the proper procedures for reviewing maternal records. The process was closely supervised by the principal investigator, a public health expert with a background in midwifery.

The data collection team worked under the supervision of five senior staff members who ensured the accuracy and consistency of the data gathered. Data were recorded on the checklist and subsequently transferred into electronic formats for further analysis.

Variable definition and measurement

The key variables for this study included the following:

Quality of maternal healthcare services: The quality of care was the dependent variable and assessed based on the completeness, accuracy, and

timeliness of documentation in the maternal health records. The completeness referred to whether all required information (e.g., prenatal care visits, delivery details, and postnatal care records) was included. The accuracy of the data was evaluated by comparing the recorded information with established medical standards and guidelines. The timeliness was assessed by evaluating whether the documentation occurred within the appropriate timeframes for each stage of care (e.g., timely prenatal visits, prompt delivery care, and postnatal follow-up).

Maternal health service utilization: This is among the independent variable, and refers to the extent to which women accessed maternal health services, such as the frequency of ANC visits, delivery services, and PNC attendance.

Socio-demographic factors: These included age, education level, marital status, and socio-economic status, which were collected to assess their impact on the quality of care received.

Data analysis

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were used to summarize the characteristics of the study population, including frequency distributions, means, and standard deviations. Continuous variables were described using mean (\pm standard deviation) or median (interquartile range), depending on the distribution of the data. To assess the normality of the numerical data, the Shapiro-Wilk test was applied.

Bivariate and multivariate analyses were conducted to evaluate the association between maternal healthcare quality and various explanatory variables, such as socio-demographic characteristics and facility type. Linear regression was used to determine the mean change in the quality of care with a one-unit change in each independent variable (Table 4). The magnitude of the dependent variable (quality of maternal healthcare services) was computed based on scores assigned to various aspects of care quality, and the scores for the relevant explanatory variables were presented.

Ethical considerations

The University of South Africa, College of Human Sciences (ethics clearance reference number

10347143_CRECHS_2023) and the Ethiopian Public Health Institute (protocol number EPHI-IRB-527-2023) have both granted ethical permission for the study. When a research procedure is given ethical permission, it is assured to follow the guidelines set forth for conducting research. Information about clients from their records was kept private. Confidentiality was upheld for the entire survey

Results

Quality of maternal healthcare services

This section presents the findings of the assessment on the quality of maternal health care services and their associated factors at public health facilities in Addis Ababa, Ethiopia, based on a review of 354 maternity medical records from five public hospitals and ten public health centers. The analysis covered various aspects of maternal health documentation, including patient identification, prenatal care services, documentation of pregnancy history, and the overall quality of maternity records. The results are summarized below, highlighting key findings in patient identification, prenatal care documentation, follow-up visits, and the management of prenatal medical conditions.

Quality of maternity medical record documentation

The review of maternity medical records across the public health facilities in Addis Ababa revealed varied levels of documentation quality. Table 3 illustrates the findings related to patient identification and biographic data in the records. The vast majority (89.3%) of the records included patient identification information such as the name or identity number on each page. However, significant gaps were observed in other personal biographic data elements. For example, only 46.3% of records contained home telephone numbers, and 31.4% documented the name of next of kin, suggesting inconsistent documentation practices.

Despite these gaps, documentation quality for key elements like the author's identification (97.2%) and legibility (98%) was generally high. The use of electronic medical records (EMRs) was observed in 63.8% of the cases, indicating an ongoing shift toward digitalization. However, the overall quality of maternity record documentation,

when considering all the essential elements, was 81.4%.

Prenatal care documentation

The review also assessed the completeness of prenatal care documentation, as shown in Table 1 and Table 2. The findings highlighted a need for improvement in documenting various aspects of prenatal care. While basic pregnancy history, such as gravidity, parity, and gestational age at delivery, was well documented in over 90% of the records, other aspects like maternal medical, surgical, and psychological history were less consistently recorded, with only 42.6% of records capturing these details. Similarly, genetic screening and counselling were documented in only 44.3% of the cases, while nutrition screening and counselling were documented in 49.9% of the records.

The documentation of risk factors and behaviours also varied. HIV pretest counselling was recorded in 96.9% of the records, but alcohol consumption, tobacco use, and other risk behaviours were recorded in only about 47% of the records. Additionally, while the physical examination was generally well documented, with 85.8% of records containing a detailed examination, the overall quality of prenatal care documentation, including supplements consistent with the ACOG (2018) standards, was 59.7%.

Prenatal care visits

In terms of ongoing prenatal care visits, the documentation quality was relatively high for general visit frequency (94.3%). However, obstetric screening, including important assessments such as fundal height (98.3%), foetal presentation (99.7%), and foetal heart rate (99.4%), was generally well documented. On the other hand, the documentation of some aspects, such as oedema (59.0%) and problem comments (59.6%), showed lower quality (Table 1).

Diagnostic testing was conducted during prenatal visits, but the documentation of trimester-appropriate testing showed lower completeness, with a total percentage of 43.3%. Risk designation, such as assessing maternal and foetal risks, was recorded in 50.5% of the cases (Table 1), indicating that there is room for improvement in the documentation of risk factors and the consistency of risk assessments.

Table 1: Status of ongoing/ follow-up prenatal care visit maternity medical records among public health facilities in Addis Ababa, Ethiopia, January 2024

Characteristics	Frequency	Percentage
General visit frequency guide (uncomplicated pregnancy)		
· Every 4 weeks until 28 weeks gestation	340	96
· Every 2-3 weeks until 36 weeks gestation	340	96
· Every week thereafter	322	91
Total percentage of general visit frequency guide record		94.3
Obstetric screening		
· LMP	286	80.8
· Weeks' gestation	347	98
· Fundal height	348	98.3
· Presentation	353	99.7
· Fetal heart rate	352	99.4
· Fetal movement	328	92.7
· Preterm labor signs and symptoms	267	75.4
· Cervical examination	220	62.1
· Blood pressure	354	100
· Weight	326	92.1
· Urine albumin/ glucose	270	76.3
· Problem/ comments	211	59.6
· Presence of edema	209	59
Total percentage of obstetric screening record		84.1
Diagnostic testing- Trimester appropriate performed		
· Early prenatal visits	195	55.1
· 8-18 weeks	111	31.2
· 20-28 weeks	126	35.5
· 32-36 weeks	88	24.9
Total percentage of diagnostic testing record in each trimester		43.3
Risk designation-diagnosis/ impression consistent with objective and subjective findings		
· Past pregnancy maternal risks	209	59
· Past pregnancy birth outcomes risks	215	60.1
· Past medical history	220	62.1
· Genetic risks	119	33.6
· Psychosocial risks	158	44.6
· Risk behaviors/ exposures	158	44.6
· Nutritional risks	166	46.9
· Abnormal maternal physical exam/ diagnostic result	195	55.1
· Abnormal fetal exam/ diagnostic result	194	54.8
· Knowledge deficit/ learning/ adherence barriers	156	44.1
Total percentage of risk designation-diagnosis		50.49
Focused assessment-each routine or follow-up obstetrical visit		
· Focused history and review of systems	244	68.9
· Unresolved problems, risk factors or care plans	201	56.8
Total percentage of focused assessment record		62.85
Total percentage of ongoing/ follow-up prenatal visits record		67

Management of prenatal medical conditions

The management of prenatal medical conditions was evaluated, with a particular focus on illnesses, medications, immunizations, and continuity of care. Table 2 shows that the quality of documentation for

significant prenatal medical conditions was 66.1%. Medication records were well documented in 83.9% of cases, but adherence to prescribed medications was less frequently reviewed, with only 49.4% of records documenting medication compliance.

Table 2: Status of maternity records on prenatal significant illnesses and medical conditions records among public health facilities in Addis Ababa, Ethiopia, January 2024

Characteristics	Frequency	Percentage
Medical records indicated prenatal significant illnesses and medical conditions		67.6
Medication records		
Medication record (dosage, dates on prescriptions)	297	83.9
Medication side effects and symptoms	214	60.5
Medication adherence review for compliance	175	49.4
Total percentage of prenatal medical records	64.6	
Immunization history and vaccine lot number, manufacturer`s name	264	74.0
Communicable diseases reporting to appropriate regulatory agency	161	45.5
Documentation of treatment plans		
A clear link to risk factors	205	57.6
Individualisation	200	56.5
Routinely updated at each visit	235	66.4
Joint implementation by the pregnant woman and her family	294	57.6
Total percentage for documentation of treatment plans	59.5	
Missed opportunities and rescheduled appointments record	221	62.4
Follow-up notation	212	60.0
Follow-up after an ER visit or hospitalization	354	100.0
Continuity of care	87	24.4
Care rendered is medically appropriate/follows guidelines, standards	140	39.6
Pregnancy education and counselling	206	58.1
Total percentage of prenatal maternity medical record	66.1	

ACOG - American College of Obstetricians and Gynecologists

Immunization history was recorded in 74.0% of the cases, but the documentation of communicable disease reporting was low, with only 45.5% of records indicating that appropriate regulatory agencies were notified. Continuity of care was notably poor, with only 24.4% of records indicating adequate follow-up and care coordination. Additionally, only 39.6% of records adhered to medical standards and guidelines, highlighting a gap in the quality of care provided (Table 2).

Overall findings on quality of prenatal care services

The overall quality of maternity medical record documentation across the public health facilities in Addis Ababa was varied, with significant strengths in certain areas such as patient identification and obstetric screening, but notable gaps in documenting biographical data, prenatal care services, and continuity of care. The integration of electronic medical records showed promising growth, though paper records still remain prevalent. The quality of prenatal care documentation, ongoing visits, and the management of medical conditions during

pregnancy reflect areas that need focused attention for improvement, as these factors play a crucial role in ensuring the safety and health of both mothers and infants.

The data gathered from this study highlights the importance of comprehensive and accurate record-keeping in improving maternal healthcare services and achieving better health outcomes. There is a clear need for enhanced training for healthcare providers on the importance of thorough and timely documentation, as well as continued efforts to improve the adoption of electronic medical records to streamline data management and facilitate better healthcare delivery.

Quality of postnatal health care services

This section presents an evaluation of the quality of postnatal care (PNC) provided in public health facilities in Addis Ababa, Ethiopia, with a focus on the completeness of documentation in maternity records, the range of services provided, and the continuity of care. The findings are derived from an analysis of maternal health records and are summarized in Table 3.

Table 3: Status of postnatal maternity records among public health facilities in Addis Ababa, Ethiopia, January 2024 (N=354)

Characteristics	Frequency	Percentage
1. Demographic Information and Type of Delivery		
Date of delivery	354	100.0
Infant birth weight	309	87.3
Gestational age at birth	330	93.2
<i>Total percentage of demographic information</i>		93.5
Type of delivery (vaginal, cesarean section, VBAC)	259	73.1
<i>Total percentage of demographic information and type of delivery</i>		83.3
2. Use of PNC Record with Components of Care		
Postpartum Visit Records	309	87.3
Postpartum visit within 21 to 56 days after delivery date	324	91.5
Postpartum visit within 21 days after delivery date	169	47.7
Postpartum visit within 56 days after delivery date	108	30.5
<i>Total percentage of postpartum visit within 21 to 51 days</i>		56.6
Postpartum Visit Components		
Physical assessment	319	90.0
Nutritional status	293	82.8
Dental care needs	111	31.4
Substance use assessment	164	46.3
Tobacco use assessment	170	48.0
Education on postpartum changes	262	74.0
Psychosocial changes	175	49.4
Family adjustments	218	61.6
Personal health habits	270	76.3
Sexual activity/family planning/preconception counseling	280	79.1
Newborn health status and care	306	86.4
Provider discusses breastfeeding	326	92.1
Member is breastfeeding	286	80.8
Laboratory testing as clinically indicated	286	80.8
Prevention of HIV/STI/Hepatitis	306	86.4
<i>Total percentage of postpartum visit records</i>		71.0
Other Postpartum Visit Aspects		
Referrals for community resources for maternal and child health as appropriate	160	45.1
Postpartum visit addresses depression	133	37.6
Postnatal visit addresses continuity of care during and after delivery	49	13.8
Total percentage of postnatal visit records		56.4

Documentation of demographic information and delivery type

The documentation of demographic information and delivery details was largely comprehensive. All records (100%) included the date of delivery, and key demographic data such as gestational age at birth and infant birth weight were documented in 93.2% and 87.3% of the records, respectively. Overall, the documentation rate for demographic information stood at 93.5%. However, the documentation of delivery type, which includes whether the delivery was vaginal, via cesarean section, or vaginal birth after cesarean (VBAC), was noted in only 73.1% of

the records. When considering both demographic information and delivery type together, the completeness rate dropped to 83.3%, highlighting a gap in the recording of some aspects of maternal care (Table 3).

Postnatal care record usage and postpartum visit documentation

A critical component of postnatal care is the documentation of postpartum visits. According to the reviewed records, 87.3% included relevant PNC data. A total of 91.5% of records documented a postpartum visit within the 21 to 56-day period

following delivery, a timeframe recommended for postnatal care. However, only 47.7% of records documented a visit within 21 days, and just 30.5% recorded a visit 56 days post-delivery. The total percentage of records documenting postpartum visits within the standard 21 to 56-day window was 56.6%, suggesting that a significant portion of visits were either not documented or fell outside the recommended period (Table 3).

Postpartum visit components

Several key components of postnatal care were well documented. For example, 90% of records included a physical assessment, and 92.1% documented a discussion of breastfeeding. Other components such as newborn health status were recorded in 86.4% of the cases, and education on postpartum changes was documented in 74% of the records. However, some aspects of care received minimal documentation. Dental care needs were recorded in only 31.4% of the records, substance use assessments were found in 46.3%, and tobacco use assessments were included in 48% of the records. The overall percentage of postpartum visit record components stood at 71%, indicating room for improvement in capturing a more comprehensive range of services.

Other postnatal visit aspects

Significant gaps were noted in other aspects of postnatal care. Referrals for community resources for maternal and child health were recorded in just 45.1% of cases, while depression screening was documented in only 37.6% of postpartum visits. Alarming, only 13.8% of records addressed the continuity of care during and after delivery. These gaps point to areas where improvements are necessary to ensure that a holistic approach to postnatal care, including mental health and ongoing support, is consistently provided.

In conclusion, while certain aspects of postnatal care, such as physical assessments, breastfeeding discussions, and newborn health status, are well documented in the records, significant gaps exist in areas such as mental health screening, referrals to community resources, and continuity of care. The overall completeness of postnatal visit records, including essential components of postnatal care, stands at 56.4%. These findings highlight key areas where enhancements are needed to ensure that all aspects of postnatal care are consistently and

comprehensively documented, ultimately improving the quality of maternal health services in Addis Ababa's public health facilities.

Factors affecting quality of maternity health care services

A number of study variables were found to be statistically significantly associated in the linear regression model with the quality of maternal health services. These variables included the women's educational background, the type of maternity record, the obstetric history and physical examination, focused obstetrical assessment, trimester-appropriate diagnostic testing, continuity of care, providing care in compliance with guidelines and standards, pregnancy education and counselling, and integrated postpartum care services.

AOR=10.51; 95%CI=6.02, 19.25) indicates that women receiving maternity care who had completed a diploma course or higher received care that was 10.51 times better quality than that of customers with no formal education. Women who enrolled online (electronic record) received care 6.82 times higher quality than those who enrolled on paper, according to the kind of maternity record (AOR = 6.82; 95%CI = 2.01, 17.09). The results show that clients' who visited medical institutions based on focused assessment had care that was 5.6 times higher quality than those who visited traditionally (AOR=5.68; 95%CI=1.61, 13.20) (Table 4).

Compared to women who received nutritional counselling and screening, the quality of maternity care was 15.16 times greater for those who had their obstetric history and physical examination reviewed (AOR=15.16; 95%CI=9.04-32.03). Women who got care in accordance with clinical practice, guidelines, and standards of care had 1.84 times higher quality care (AOR=1.84; 95%CI=1.09-5.73) than women treated without following guidelines and standards (Table 4). However, no significant association was observed between the quality of maternity care and the following factors: clients' age, marital status, occupation, primary language, socioeconomic status, or gestational age; missed opportunities and rescheduled appointments; outcomes of previous pregnancies; medical-surgical and psychosocial history; genetic screening and counselling; or risk behaviors/exposures.

Table 4: Factors associated with quality of maternal health care services among public health facilities of Addis Ababa, Ethiopia, January 2024

Variables (base ACOG guidelines)	%	AOR(95% CI)
Educational back ground of the women		
No formal education	72(6.8)	1
Elementary, junior or high school	405(38.1)	0.37(0.06, 1.58)
Diploma and above	585(55.1)	10.51(6.02-19.25)
Type of maternity record		
Electronic record	226(63.8)	6.82(2.01-17.09)
Paper based	128(36.2)	1
Prenatal care section of the maternity		
Obstetric history and physical examination	78.84	15.16(9.04-32.03)
Medical-Surgical and Psychosocial History	42.55	6.37(0.75-15.14)
Genetic Screening and Counseling	44.3	2.84(0.27-5.081)
Tracking risk behaviors	56.98	13.71(0.91-28.3)
Nutritional screening and counseling	49.88	1
Ongoing prenatal care		
General visit frequency (routine)	94.3	1
Obstetric screening	84.1	4.92(0.01-7.02)
Diagnostic testing – Trimester appropriate	43.27	6.74(2.13-18.04)
Risk designation – diagnosis	50.49	
Focused obstetrical assessment	62.85	5.68(1.61-13.20)
Performing continuity of care		
Yes	87(24.4)	12.08(7.36-21.02)
No	267(75.6)	1
Care in accordance with guidelines and standards		
Yes	140(39.5)	1.84(1.09-5.73)
No	214(60.5)	1
Pregnancy education and counseling		
Yes	58.1	6.49(3.24-19.86)
No	41.9	1
Postnatal maternity service		
Demographic information and type of delivery	83.3	1
Schedule of postpartum visit within 51 days	56.58	12.32(0.54-33.5)
Integrated postpartum care services	71.02	3.06(1.97-11.24)

Rigor

The validity, reliability, and trustworthiness of the quantitative data, as well as the data collection tools, were all guaranteed in order to assure research rigor. Rigor, which demands exact precision, discipline, and attention to detail, was the driving force behind this research's quest of excellence. To ensure precision and excellent research quality, this study employed different methodologies for the quantitative components. Among the methods employed to ensure reliability and trustworthiness were peer evaluation and member verification.

Discussion

Quality of maternal healthcare services

This study revealed that the maternity care provided to women in Addis Ababa was dependent on the available resources at health facilities. Despite the city’s relatively better access to and utilization of maternal health services, maternal deaths from preventable causes persist. The findings suggest that a significant percentage of maternal deaths could be avoided with high-quality healthcare. Timely interventions and treatment can make the difference between life and death for both the mother and the

child. The study found that 61.6% of family planning services met high-quality standards based on quality indicators. This rate is considerably higher compared to similar studies conducted in the Democratic Republic of the Congo (20%)¹⁷, another study in Ethiopia (44%)¹⁸, and research in four regions of Ethiopia (31%)¹⁹. These discrepancies may be due to variations in ANC measurement approaches, the availability of skilled attendants, study settings, designs, and cultural differences.

In terms of prenatal care services, 66.12% of the ANC services provided in Addis Ababa public health facilities met high-quality standards, which is higher than the findings from studies conducted in Hossana town (31.38%)²⁰, Sidama region (41.2%)²¹, and other parts of Ethiopia and East Africa (22.48%²², 11.16%²³, 30%²⁴). These discrepancies could be attributed to differences in quality assessment methods, the availability of trained personnel, study design, location, and cultural contexts. Moreover, access to healthcare in remote areas may be limited by inadequate infrastructure and transportation.

Despite these improvements, significant gaps remain in service delivery. Some health facilities still struggle with limited access to quality care, making healthcare services neither affordable nor easily accessible. This is inconsistent with the FMOH Guideline²⁵. However, achieving high-quality healthcare requires access to well-equipped facilities and consistent service delivery. Women in some public health facilities face restrictions, such as the lack of skilled attendants, shortages of medicines, and inconsistent provision of services. It is concerning that certain maternal health services are sometimes provided arbitrarily, with some midwives failing to follow standard operating procedures, checklists, or maintain proper documentation.

This study assessed the quality of maternal healthcare services by examining input, process, and output indicators, with a focus on process improvement (Figure 1). Despite challenges such as inadequate resources, poor management, communication breakdowns, and lack of recognition, women at public health institutions received services at no cost. However, patients expressed a preference for a one-stop service, as many faced inconvenience purchasing medications

at private pharmacies, with service offerings varying from day to day based on availability.

Factors affecting quality of maternal healthcare services

To improve the quality of maternity care, understanding the factors influencing it is critical. The study found several factors associated with the quality of maternal healthcare services. These included the women's educational background, type of maternity record, obstetric history, physical examination, focused obstetric assessment, trimester-appropriate diagnostic testing, continuity of care, adherence to clinical guidelines, pregnancy education, and integrated postpartum care services.

The results showed that women with a diploma or higher education received care of significantly better quality (AOR=10.51; 95%CI=6.02, 19.25) than those with no formal education (Table 4). This finding is consistent with studies in Wa municipality, Ghana²⁶, Dodoma, Tanzania²⁷, and other regions of Southern Ethiopia¹². Studies in low- and middle-income countries²⁸ also emphasize that the quality of maternal health services improves with clients' educational status. The findings suggest that increasing client awareness can enhance the quality of care. In contrast, a study in Indonesia²⁹ did not find a significant association between the quality of care and women's educational background, indicating that contextual differences may play a role.

The study also revealed that women who enrolled using electronic records received care of 6.82 times better quality (AOR=6.82; 95%CI=2.01, 17.09) compared to those enrolled using paper records. Similarly, women who received care based on focused obstetric assessments received care that was 5.6 times better (AOR=5.68; 95%CI=1.61, 13.20), aligning with findings from a study in Michigan^{30,31}. This indicates that the use of electronic records and focused assessments improves the quality of care by providing a more comprehensive understanding of the clinical and social determinants influencing pregnancy.

Additionally, women who underwent obstetric history-taking and physical examinations received care 15.16 times better (AOR=15.16; 95%CI=9.04, 32.03) than those who only received nutritional counseling and screening.

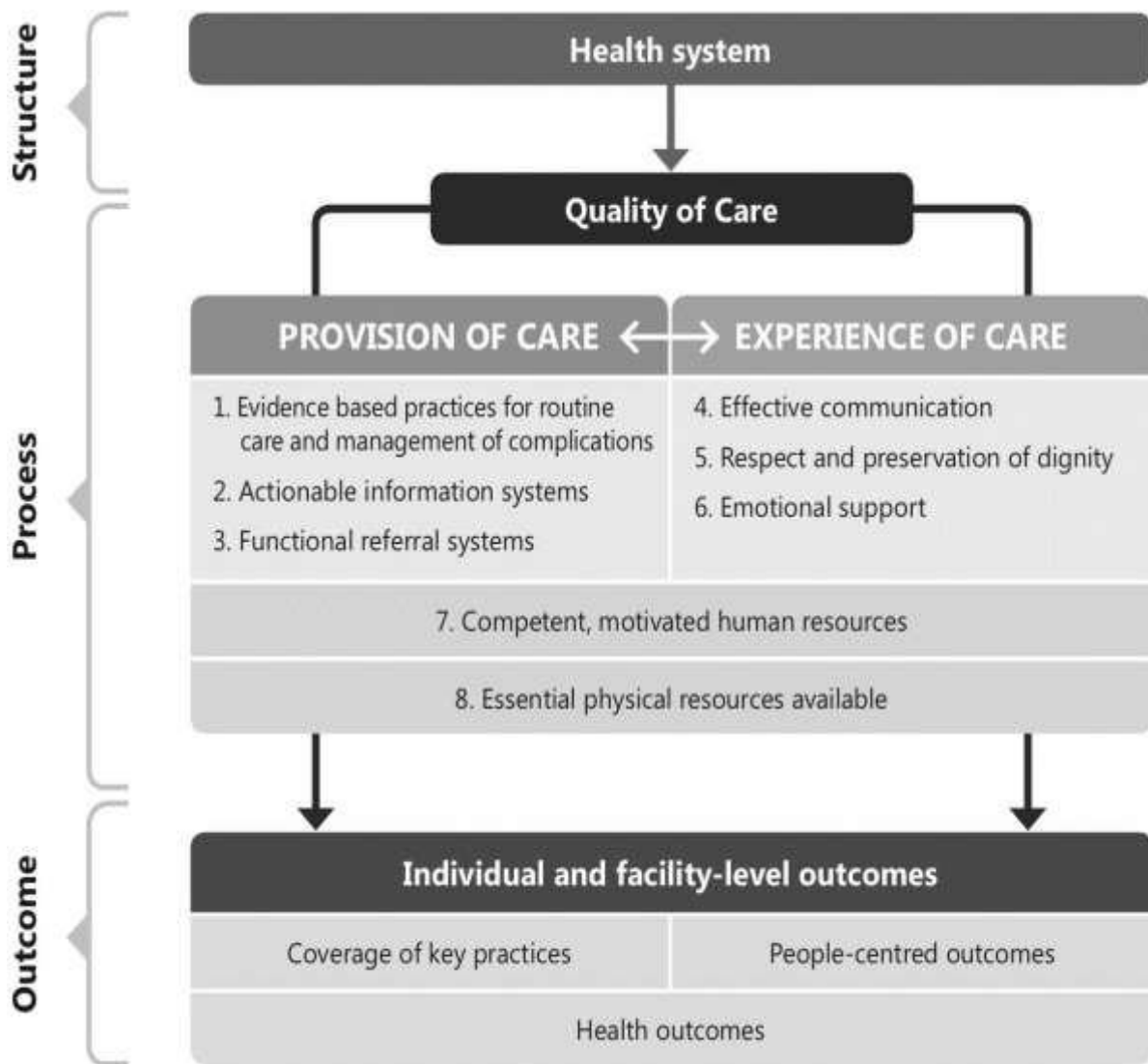


Figure 1: WHO quality of care framework for maternal and newborn health: Reproduced with permission under the terms of the Creative Commons Attribution License from the BJOG: An International Journal of Obstetrics and Gynaecology (Sheffel, Karp and Creanga, 2018: 2)

Women receiving care in compliance with clinical guidelines had 1.84 times higher quality care (AOR=1.84; 95%CI=1.09-5.73) than those treated without adherence to these guidelines (Table 4). These findings are consistent with studies conducted in Indonesia²⁹ and Accra, Ghana^{31,32}. A thorough physical examination and detailed obstetric history are essential for identifying health risks, ensuring safe pregnancies, and providing appropriate guidance for pregnancy health and safety.

However, the study did not observe a significant association between the quality of maternal healthcare and variables such as clients'

age, marital status, occupation, primary language, socioeconomic status, gestational age, missed opportunities, rescheduled appointments, previous pregnancy outcomes, medical-surgical and psychosocial history, genetic screening, or risk behaviors/exposures. In conclusion, enhancing maternal health care quality is contingent on various factors, including the educational status of women, the use of electronic records, focused assessments, and adherence to clinical guidelines. While improvements have been made, ongoing efforts are needed to address gaps in documentation and care delivery.

Strengths and limitations

This study provides a comprehensive assessment of maternal healthcare services in Addis Ababa, utilizing a large sample of maternity records across multiple public health facilities. The review of both prenatal and postnatal care documentation, alongside the analysis of factors influencing care quality, offers valuable insights into the strengths and gaps in the system. Additionally, the inclusion of both electronic and paper medical records helps highlight the shift towards digitalization in healthcare while addressing existing challenges in data management. The use of quantitative analysis, including regression models to identify factors influencing care quality, strengthens the robustness of the findings, making them highly relevant for policy and practice improvements in maternal health.

Despite its strengths, this study has some limitations. The analysis relied on retrospective medical record reviews, which may be subject to documentation errors and inconsistencies. The findings are based on data from public health facilities in Addis Ababa, which may not be generalizable to rural areas or private healthcare settings, limiting the external validity of the results. Additionally, while the study explored a wide range of factors, it did not capture patient perceptions or experiences directly, which could provide deeper insights into the quality of care. The cross-sectional nature of the study also limits the ability to establish causal relationships between the identified factors and the quality of care.

Conclusions

In conclusion, this study provides a thorough evaluation of the quality of maternal healthcare services in Addis Ababa, revealing significant gaps in documentation practices, prenatal and postnatal care, and continuity of care. While access to maternal health services is relatively good, challenges remain in ensuring consistent, high-quality care, particularly in areas like risk factor documentation, maternal medical history, and continuity of care. The study highlights the impact of factors such as women's educational background, the use of electronic medical records, focused obstetric assessments, and adherence to clinical guidelines on the quality of care. Although paper

records remain prevalent, the increasing use of EMRs offers promise for improving data management and continuity of care. To improve maternal health outcomes, it is critical to address these gaps through enhanced training for healthcare providers, better documentation practices, and improved adherence to clinical standards. Strengthening these areas will contribute to reducing maternal and infant mortality rates and improving the overall quality of maternal healthcare services in Addis Ababa.

Recommendations

Based on the findings of this study, it is recommended that significant efforts be made to improve the quality of maternal healthcare services in Addis Ababa, focusing on strengthening documentation practices, particularly in areas such as maternal medical history, risk factor identification, and continuity of care. Healthcare providers should receive ongoing training to ensure consistent adherence to clinical guidelines and improve the completeness of prenatal and postnatal care records. Additionally, the adoption of electronic medical records (EMRs) should be accelerated to enhance data management, reduce reliance on paper records, and improve care continuity. Efforts to increase women's education and awareness about maternal health should also be prioritized, as these factors were found to positively influence care quality. Finally, improving healthcare infrastructure, ensuring adequate resources, and fostering a culture of quality care will be essential in reducing maternal and infant mortality rates and achieving better health outcomes for women and children in Addis Ababa.

Acknowledgements

The authors would like to thank all the data collectors and supervisors. Our appreciation is extended to the health facilities' staff members for their invaluable insights and information provided during our data collection at field.

Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors contributions

Both authors contributed equally during the process of proposal development. SAT and Robert TN participated in data collection and analysis. SAT prepared the draft. Then TRN revised drafts of the paper. All authors read and approved the final manuscript.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Data availability

Raw data were generated at Public health facilities of Addis Ababa. Derived data supporting the findings of this study are available from the corresponding author Sintayehu Abate on request.

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