

Determinants of Eight Contacts Antenatal Care Uptake Among Prenatal Mothers in Changamwe Sub-County Mombasa, Kenya

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Abstract

The purpose of this study was to assess the determinants influencing ANC uptake among prenatal mothers in Changamwe, Mombasa, Kenya. The study was based on the following objective; to assess how quality ANC services influence ANC uptake among pregnant women in Changamwe Sub-County. The study was anchored on the Expected Utility (EU) Theory and Theory of Planned Behaviour (TPB). A mixed-method research design incorporating both qualitative and quantitative approaches was employed. The target population included postnatal mothers attending maternal child health clinics in public health facilities and maternal child healthcare clinic nurse managers as key informants. A total of 370 mothers and 4 nurse managers participated in the study, selected using stratified and simple random sampling techniques. Data collection involved structured questionnaires for mothers and key informant interviews with nurse managers. Descriptive statistics were used to summarize the findings, while correlation and multiple regression analyses assessed relationships between study variables. The results indicated that the quality of ANC services significantly influenced ANC uptake. Specifically, the quality of ANC services was another significant predictor ($\beta = 0.42$, $p = .003$), emphasizing the importance of service quality in encouraging ANC visits. Based on the findings, the study recommends enhancing ANC service quality through respectful care, skilled provider training, and ensuring reliable supply chains for ANC commodities is also advised. Addressing health need-related barriers by promoting early screening for pregnancy complications and increasing maternal health literacy is crucial. Additionally, re-evaluating the role of community health care workers through targeted training, supervision, and structured home visit and referral frameworks is necessary. Implementing broad community sensitization campaigns to boost awareness and dispel myths surrounding ANC, adopting digital health tools to track ANC appointments and facilitate timely maternal care interventions, and encouraging further research on community health care workers effectiveness in ANC promotion within varied contexts are also recommended. These recommendations underscore a need for multi-level interventions—ranging from household empowerment to service delivery improvements to increase ANC uptake and ultimately reduce maternal and neonatal morbidity and mortality.

Key words: Kenya, Changamwe, Antenatal Care, Expected Utility Theory, Human Immunodeficiency Syndrome, Kenya Demographic Health Survey, Sustainable Development Goals, World Health Organization, community healthcare workers

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Introduction

World Health Organization (WHO) identified six building blocks for health-system strengthening: service delivery, health workforce, health information systems, access to key medicines, governance, leadership, and financing (WHO, 2016). This study was founded on the notion of service delivery, which works best when equitable access to a diverse range of high-quality health services is assured within a cohesive and patient-centered care continuum (Orton et al., 2018). Eight contacts. Antenatal care, or ANC, is a critical aspect of service delivery because it provides a platform for health systems measures to boost the usage and level of care delivered, raising the demand for and standard of ANC services. Examples include midwife-led continuity of care and ANC contact regimens, among others. By implementing ANC within a complete quality service delivery framework, it can act as a catalyst for improving the resilience of health systems (de Masi et al 2017).

Antenatal care (ANC) refers to the support and medical attention provided by medical experts to teenage girls and expectant mothers in order to achieve the best possible health for both the mother and the foetus throughout pregnancy (WHO, 2016). This care package includes essential services and interventions throughout pregnancy, focusing on prevention, risk assessment, and the treatment of ailments connected to pregnancy. Additionally, it encompasses advice on nutrition, promoting good health, and preventing diseases including tuberculosis, HIV and malaria. This comprehensive approach aims to offer a high-quality, adaptable care package based on procedures based on evidence, providing appropriate and pertinent guidance and assistance throughout pregnancy (Hackett et al., 2019). ANC helps reduce perinatal and maternal morbidity and mortality by directly addressing problems associated with pregnancy and identifying those at higher risk for complications during labor and delivery, facilitating appropriate referrals (Wolde et al., 2019).

Furthermore, despite the availability of prenatal care, women's health has deteriorated in recent years, with maternal mortality rates increasing or decreasing in practically every region of the world (WHO, 2023). In 2020, the expected rate of maternal death per 100,000 live births was 223 worldwide, with Australia at 5, the United States at 21, Brazil at 72, Afghanistan at 620, and Bangladesh at 123 (Khalid et al., 2023). South Africa 127, Central African Republic 835, Kenya 530, and Nigeria 10479 (WHO 2023). Additionally, two million stillborn babies were delivered worldwide in 2019, occurring after 28 weeks of pregnancy, and many of these deaths could have been prevented with proper care (United Nations Children's Fund [UNICEF], 2020). Furthermore, it is anticipated that 2.4 million children died within their first month of birth in 2020, equivalent to around 6,500 newborns every day worldwide (UNICEF, 2021). Global newborn death rates per 1,000 live births varied, with Australia at 2, Brazil at 9, China at 3, Afghanistan at 34, Ethiopia and Bangladesh at 16, South Africa at 11, and Nigeria at 35 (Cresswell & World Health Organization 2023). In Kenya, there were 21 neonatal deaths per 1000 live births (Kenya Demographic Health Survey [KDHS], 2022). As a result, identifying the factors of antenatal

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care uptake among pregnant moms is critical for improving service delivery and strengthening the health system in order to minimize maternal and perinatal mortality rates.

The Sustainable Development Goals (SDGs) aim to reduce maternal fatalities to less than 70 per 100,000 live births and neonatal mortality to 12 per 1,000 live births by 2030 (UN General Assembly, 2015). Antenatal care (ANC) coverage is an important statistic for assessing healthcare access and utilisation throughout pregnancy, as well as for tracking progress towards SDG number three (Apanga and Kumbeni, 2021). In 2016, the World Health Organisation (WHO) issued updated ANC guidelines, recommending an increase from four to a maximum of one ANC visit, with a minimum of eight. This statement is supported by data that more regular antenatal care (ANC) uptake can reduce perinatal mortality and improve the pregnancy experience for women. The updated schedule includes an initial contact in the first trimester at 12 weeks, two contacts in the second trimester at 20 and 26 weeks, and five contacts in the third trimester at 30, 34, 36, 38, and 40 weeks (WHO, 2016). A systematic study of women's perceptions found that having a positive pregnancy experience is a strong motivator for attending ANC (Downe et al., 2019).

The proportion of women who had eight or more antenatal care (ANC) appointments varies by country: 74.0% in Jordan, 43.0% in Ghana, and 30.0% in Albania (Ekholuenetale, 2021). In Bangladesh, just 6% of women completed eight ANC sessions (Sarker et al., 2020), whereas in South Africa, the figure was 24.9% (Hoque et al., 2022), and in Nigeria, it was 17.4% (Ekholuenetale et al., 2020). Although Kenya's government followed the WHO's recommendation, 66% of women received four or more ANC visits from a skilled healthcare professional, with only 3.5% completing eight ANC visits (KDHS, 2022; Macharia et al., 2022). Changamwe sub-county, with 6% women, completed eight ANC contacts (Kenya Health Information System).

Statement of the Problem

Despite the WHO's recommendation of eight antenatal care (ANC) contacts to prevent newborn and maternal mortality, acceptance of this critical service remains alarmingly low in Kenya, particularly in the Changamwe sub-county. Between 2020 and 2023, the proportion of pregnant women who completed the necessary eight ANC visits in Changamwe remained persistently below 15%, with annual estimates of 5% in 2020, 5% in 2021, 6% in 2022, and 13% in 2023.

During the same time period, perinatal death rates in Changamwe sub-county remained high, ranging from 25 to 32 per 1,000 live births, with annual rates of 32 in 2020, 31 in 2021, 25 in 2022, and 29 in 2023. Maternal fatalities per 100,000 live births also fluctuated substantially, reaching 27 in 2020, 243 in 2021, 73 in 2022, and finally 25 in 2023. The continuous low ANC acceptance may reflect fundamental concerns with the quality of ANC services given in health facilities. These results underscore a critical need to address barriers that limit ANC participation to enhance mother and neonatal health outcomes in the region.

Objective of the Study

- i. To assess how quality ANC services influence ANC uptake among pregnant women in Changamwe Sub-County.

Review of Related Literature

Quality of ANC Services

The Donabedian model is used to assess ANC quality across three dimensions: input, process, and output. Examples of input dimensions include physical infrastructure, documentation, skilled people, medical medications, immunizations, equipment, and supplies. Interpersonal communication, history-taking, clinical examination, counselling, health screening, and preventive interventions are all process characteristics. Client satisfaction will ultimately determine the outcome (Amare & Bekalu, 2023).

Satisfaction with 8 contacts ANC

Satisfied patients often have better health results, greater continuity of care, better treatment adherence, and closer relationships with their doctors. Furthermore, satisfied patients are more likely to return for services and refer them to others (Ademuyiwa, 2020).

Olusesi (2022) conducted a study in Nigeria to gauge how satisfied expectant women are with antenatal care services. The findings indicated a rise in antenatal care utilization when healthcare authorities prioritize patient-centered care and enhance treatment's acceptability, availability, accountability, and reliability. Furthermore, incorporating patient feedback with technological support, fostering communication and collaboration among stakeholders, and increasing community involvement were recommended to enhance service quality. The study underscored the significance of interpersonal relationships between providers and clients in improving the uptake of ANC services.

Similarly, Lire et al. (2022) examined ANC service satisfaction among pregnant women in Ethiopia. Overall, 79.2% of respondents expressed satisfaction with ANC services, with high satisfaction ratings for specific components such as information provision and institutional healthcare. Factors like shorter waiting times and receiving information on fetal movement were substantially correlated with ANC service satisfaction.

Amare and Bekalu (2023) examined the quality of antenatal care (ANC) in Ethiopia. They found that mothers who received guidance on their birth plan were seven times more likely to find ANC satisfactory services compared to individuals who didn't. This underscores the significance of offering thorough counseling on birth plans during ANC uptake to boost client satisfaction and amplify the ANC service use, which could lead to better neonatal outcomes.

Furthermore, Onyeajam et al. (2018) explored Antenatal care satisfaction in Nigeria, identifying factors positively correlated with client satisfaction, such as prompt service, convenient clinic hours, consultation privacy, staff empathy, and non-discriminatory treatment. They propose that increasing client responsiveness, raising the standard of professional care, making sure that equipment is available, making medications easier to obtain, and increasing the accessibility of free ANC services can all contribute to increased ANC satisfaction.

Organization of ANC Services

The duration of patient waits combined with consultation protocols and clinic operational hours determines appointment compliance among pregnant people visiting these facilities.

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The adherence rates could improve through expanding consultation points together with extended hours of operation according to Opon et al. (2021).

Muhirwe (2021) discovered that women exhibiting a preference to finish all recommended ANC appointments did so when accessing care from facilities presenting extended hours and multiple appointments weekly. Different aspects of antenatal care service delivery, including access features and educational material, and appointment organization should be improved to create positive interactions that boost client attendance for recommended visits. The findings indicate that health system managers from all levels must place service delivery timing as a top priority.

Public health facilities face a serious obstacle in providing maternal healthcare because of insufficient waiting areas according to Tsegaye et al. (2021). Pregnant women avoided maternal health clinic visits at health posts because of inadequate waiting areas, together with the poorly designed ANC room. Improving maternal healthcare requires healthcare facilities to enhance their infrastructure to create comfortable facilities for patients during their service period.

Availability of commodities and supplies in facilities

The readiness of health facilities determines the delivery of quality antenatal care services and the pregnancy services among women. The assessment of facility readiness necessitates testing central electric power and assessing service organization as well as equipment availability and facility service completeness which encompasses all requisite services (Khatri et al., 2022).

Through research in Ghana Sumankuuro et al. (2018) investigated how different aspects of the healthcare system block quality care access for expectant women and their newborns. The researchers uncovered two major obstacles which included minimal medical equipment and insufficient essential medical supplies. They proposed to enhance healthcare resources as a solution for dealing with these healthcare challenges. This initiative involves healthcare providers to pursue targets regarding maternal and newborn health worldwide and equalize medical service distribution.

Kilowua and Otieno (2019) performed research in Kenya that evaluated the effects that health system elements have on people using ANC services. Research results demonstrate that when facilities run out of essential commodity items pregnant women decrease their visits to healthcare centers significantly. The researchers recommend providing equipment enhancements to rural health facilities as an approach to diminishing hospital transfers.

Research conducted by Gamberini et al. (2022) along with Defar et al. (2020) as well as Mollel et al. (2024) showed that inadequate essential healthcare resources affect antenatal care (ANC) service access. Coping deficiencies among pregnant women will make them less likely to attend ANC appointments. A solid healthcare system demands guaranteed equal access to tested safe medical products and effective health technologies that demonstrate high quality. The proper implementation of strategies that enhance new medical product availability serves as a crucial step to achieve healthcare service equality.

Theoretical Framework

Expected Utility (EU) Theory

Expected Utility (EU) Theory functions as an economic fundamental for understanding how people make uncertain choices, including decisions about antenatal care uptake for pregnant

women. The EU theory presents a framework where people attempt to reach the greatest anticipated utility by performing detailed assessments between resulting rewards and accompanying expenses. Insurance decision-making serves as an illustrative case according to Manning and Marquis (1996), who show people consider uncertain unsubsidized financial losses against definitely subsidized ones.

Perceptions of ANC importance for child well-being among mothers lead them to choose these services according to EU Theory principles according to Laisser et al. (2022). EU Theory recognizes individual differences in risk-oriented behavior preferences among human beings. Health services need to understand individual risk preferences and outer factors like income level and healthcare access because these elements matter. Omikos showed that financial constraints function as a major impediment to mothers seeking ANC according to Ekholuenetale et al. (2021).

Theory of Planned Behaviour (TPB)

The psychological model known as the Theory of Planned Behaviour (TPB) provides an understanding of health-related behaviors by explaining among others, why pregnant women attend ANC. According to the Theory of Planned Behavior behavioral intentions result from evaluating specific attitudes while responding to perceived social pressures and feeling one's ability to act on the behavior. The positive or negative evaluations of behaviors determine how much expectant mothers attend their ANC appointments. The research conducted by Khatri & Karkee (2018), alongside Laisser et al. (2022), shows that positive maternal attitudes lead to higher usage rates of ANC services. Subjective norms derive their influence from social and cultural aspects, which play an essential part. Research shows that mothers base their decision about attending ANC appointments on how important people, including relatives will support them (David, 2022). The belief that one possesses the capability to perform a behavior defines Perceived Behavioural Control. Self-efficacy levels, together with external obstacles, determine how people perceive their behaviors. Intervention strategies should include these elements because they enhance the likelihood of women using ANC services. Empirical evidence confirms this model per the recommendation of Ajzen (1991).

Research design

A mixed-method research design incorporating both qualitative and quantitative approaches was employed. The target population included postnatal mothers attending maternal child health clinics in public health facilities and maternal child healthcare clinic nurse managers as key informants. A total of 370 mothers and 4 nurse managers participated in the study, selected using stratified and simple random sampling techniques. Data collection involved structured questionnaires for mothers and key informant interviews with nurse managers.

Table 1: Target Population

Level Facility	Target Population	Percentage of Population (%)
Portreitz Sub-County Hospital	3,100	59
Chaani Health Centre	930	18
Bokole Health Centre	930	18
Magongo Dispensary	310	5
Total	5,270	100

Source: Research data (2025)

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The sample size was calculated at a 95% confidence level and +- 5% precision using the Yamane formula (1967) as shown

Formula: $n = \frac{N}{1 + N(e)^2}$

Where: n – demonstrates sample size N – denotes Population size

e –the level of precision or sampling error at 5%

$$n = \frac{N}{1 + Ne^2}$$

Hence;

$$372 = \frac{5270}{1 + 5270 (0.0025)}$$

Therefore, the study sample size was 372 mother respondents was 7% of the Target population.

Table 2: Postnatal mothers' sample size distribution

Facility	Population(N)	Sample size (n)
Portreitz Sub-County Hospital	3100	218
Chaani Health Centre	930	66
Bokole Health Centre	930	66
Magongo Dispensary	310	22
Total	5270	372

Source: Research data (2025)

Table 3: KII Sample size distribution

Level facility	Target population	Percentage of population
Portreitz sub-County Hospital	1	25
Chaani Health Centre	1	25
Bokole Health Centre	1	25
Magongo Dispensary	1	25
Total	4	100

Source: Research Data (2025)

Results and discussion

Quality of ANC Services

The objective of the study was to assess how quality ANC services influence ANC uptake among pregnant women in Changamwe Sub-County. The quality of prenatal care (ANC) services was evaluated using a variety of factors, including blood pressure monitoring, foetal

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heart rate checks, healthcare practitioner conduct, service convenience, privacy, and commodity availability. The results are summarized in Table 4 below.

Table 4: Quality of Eight ANC Uptake

Indicator	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Blood Pressure (BP) Checks Conducted	1.6	0	0.3	49.2	48.9
Weight Monitored Consistently	1.1	0	0.5	46.2	52.2
Fetal Heart Rate Monitored Regularly	1.1	0	0.3	48.6	50.0
Treated with Dignity and Respect	0	0.8	1.4	51.9	43.0
Convenient Operating Hours	1.9	0	3.2	49.7	41.9
Privacy Respected	0.3	0	0.5	52.4	46.2
Missed ANC Due to Stock-Outs	30.5	57.0	3.2	6.2	2.7
Overall Positive Experience	0.3	0.8	2.7	51.6	41.6

Source: Research data (2025)

The data show that the overall quality of ANC services was high, with a large majority of respondents agreeing or strongly agreeing that critical features of care were addressed. Almost all respondents said that their blood pressure (98.1%) and weight (98.4%) were consistently measured. Regular monitoring is crucial for detecting pregnancy-related problems including preeclampsia (WHO, 2020). A total of 98.6% of respondents acknowledged that foetal heart rate monitoring was done regularly, which is necessary for tracking foetal well-being (UNICEF, 2021). Furthermore, majority of responders (94.9%) reported being handled with dignity and respect. Positive interactions with healthcare personnel increase maternal satisfaction and promote continuous use of ANC services (Smith et al., 2019). Majority of respondents (91.6%) found the operating hours convenient, and 98.6% felt their privacy was protected, which is critical for providing comfortable and accessible healthcare (MOH Kenya, 2021). While 87.5% did not believe that stock-outs prevented them from attending ANC, 8.9% reported missing uptake due to a lack of needed supplies, which could have a significant influence on maternal and foetal outcomes (Guttmacher Institute, 2022). Overall experience majority of participants (93.2%) reported favorable experiences with ANC services, indicating overall satisfaction with the services obtained. These findings emphasize the benefits of ANC service delivery, notably in terms of monitoring, provider behaviour, and accessibility. However, resolving stock-outs of important commodities remains a critical area for improvement to offer continuous care for all pregnant women.

Qualitative Analysis of Key Informant Interviews (KIIs)

The Key Informant Interviews (KIIs) provided rich insights into the role of community health care workers (CHWs), the effectiveness of home visits, the referral process, and various factors influencing antenatal care (ANC) utilization. The availability of ANC commodities was highlighted as a key determinant of service quality. Several informants stressed the importance of a consistent supply of essential ANC medications, supplements, and diagnostic tools. One key informant stated that "erratic supply of ANC commodities makes care expensive and inaccessible for some women." This challenge aligns with UNICEF (2021) findings, which emphasize the need for stable supply chains to ensure that essential maternal health commodities are always available. Strengthening procurement and distribution mechanisms could mitigate this issue and improve ANC service delivery.

Summary

The quality of ANC services was positively associated with ANC uptake ($r = 0.786$, $p < 0.01$), and regression analysis confirmed its significance as a predictor ($B = 0.685$, $p < 0.001$). Essential ANC services such as blood pressure monitoring (98.1%), fetal heart rate checks (98.6%), and weight monitoring (98.4%) were consistently provided, indicating high service quality. Additionally, 94.9% of respondents reported being treated with dignity and respect, reinforcing the importance of healthcare provider conduct in maternal health. However, the study also found that 8.9% of respondents missed ANC uptake due to stock-outs of essential supplies, highlighting the need to strengthen supply chain management to ensure continuous service delivery (UNICEF, 2021).

Conclusion

The study concludes that ANC uptake falls significantly below the recommended standard. Early initiation remains a challenge. Household support, health-related factors, and the quality of ANC services were found to be strong determinants of ANC uptake. However, CHWs had no significant influence on ANC uptake, suggesting a need to review their effectiveness in maternal health promotion. Stock-outs of essential ANC supplies remain a concern, necessitating improved supply chain management. Overall, addressing these barriers can enhance ANC uptake and improve maternal and neonatal health outcomes in Chagamwe Sub-County.

Recommendations

The quality of ANC services was a significant predictor of ANC uptake. The Ministry of Health and relevant stakeholders should invest in improving service delivery by ensuring respectful maternity care, availability of essential supplies, competent personnel, and comprehensive maternal health services such as fetal assessments and nutritional counseling. Regular training and supportive supervision for healthcare workers should be prioritized.

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