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ORIGINAL ARTICLE

# Socio-demographic Factors Associated with Choice of Place of Delivery Among Women Attending Antenatal Care at Tassia Kwa Ndege Hospital Embakasi East, Nairobi Kenya

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## ABSTRACT

**Background:** Maternal health is a global public health concern that is crucial in the development of any nation. Kenya has made considerable efforts to increase access to quality maternal health care. Nairobi County constructed new hospitals within densely populated areas to bridge the gap to healthcare access and reduce the strain on already existing health facilities that are overcrowded. However, the rate of deliveries within these facilities remains low. This study aimed to explore factors influencing choice of place of delivery, specifically focusing on socio-demographic factors.

**Methods:** A cross-sectional study design was employed utilising quantitative data collection methods. Using Fisher's formula and accounting for a 10% non-response rate, a sample size of 314 women was determined. Structured questionnaires were administered to 290 participants, yielding a response rate of 92%. In-depth interviews were conducted by women attending antenatal care services at Tassia kwa Ndege Hospital. Data were analysed using SPSS, with descriptive statistics and chi-tests employed to establish associations between socio-demographic factors and the choice of place of delivery.

**Results:** The study revealed that a majority of women preferred other health facilities as their place of delivery compared to Tassia kwa Ndege. The study found that there was an association between socio-demographic factors and the choice of place of delivery. Age ($P$<.001), education ($P$<.003.), parity ($P$<.001), marital status ($P$<.190), religion ($P$<.048), head of family ($P$<.001) and decision maker ($P$<.001).

Conclusion: The majority of women participating in the study chose to deliver at hospital facilities other than Tassia kwa Ndege Hospital. The choice of place of delivery was strongly influenced by factors such as age, educational level, parity, and religion. The study offers valuable insights into the implementation of maternal health programmes and in developing context-specific strategies to promote maternal and child health.

## BACKGROUND

Maternal morbidity and mortality remain major public health concerns, particularly in low- and middle-income countries, where preventable complications during pregnancy and childbirth continue to contribute substantially to maternal deaths. Reducing the global maternal mortality ratio (MMR) to less than 70 deaths per 100,000 live births is a key target of Sustainable Development Goal 3 (SDG 3). However, maternal mortality remains disproportionately high in developing countries, which account for approximately 70% of global maternal deaths, with an estimated maternal mortality ratio of 230 deaths per 100,000 live births.[1]

Globally, approximately 295,000 maternal deaths were estimated to have occurred in 2017, with Sub-Saharan Africa and South Asia accounting for approximately 86% of these deaths; Sub-Saharan Africa alone accounted for nearly two-thirds of the global burden.[2] A substantial proportion of these deaths result from complications associated with pregnancy and childbirth that can be prevented or effectively managed through timely access to quality maternal healthcare services.[3] Skilled birth attendants play a critical role in preventing maternal and neonatal complications and are predominantly available within health facilities. Nevertheless, only about 60% of women globally were reported to deliver in health facilities during the period referenced [4], highlighting persistent gaps in access to and utilisation of skilled delivery services.

In 2020, maternal deaths worldwide among women of reproductive age 15-49 stood at 287,000.[5] Maternal morbidity and mortality are a global public health concern. Increasing accessibility to quality health services is a global effort among many countries with the goal of realising the right to the best possible healthcare during pregnancy and childbirth, while reducing inequalities in reproductive health. Maternal health is therefore deemed as a key indicator for human health. Generally, good health, and in particular maternal health, plays a major role in poverty

alleviation and human development. Maternal healthcare service utilisation is crucial for improving maternal health that has the potential to reduce morbidity and maternal mortality.

Globally, considerable efforts have been undertaken to reduce pregnancy-related morbidity and mortality and improve the quality of maternal healthcare during pregnancy, childbirth, and the postpartum period. These efforts include strengthening antenatal care in accordance with World Health Organization recommendations; expanding access to skilled birth attendance and emergency obstetric and newborn care; and improving access to family planning and reproductive health services. Additionally, countries have invested in universal health coverage, community-based maternal health programmes, emergency referral and transport systems, maternal death surveillance and response mechanisms, and respectful maternity care.

In Sub-Saharan Africa, pregnant women have a risk of losing their lives from preventable complications of pregnancy estimated at 1 woman among every 55 pregnant women compared to approximately 1 in 21,248 in Australia and New Zealand in 2023, demonstrating persistent inequalities in maternal health.[6] This shows that maternal mortality is still a huge burden in the Sub-Saharan Africa region and thus needs to be addressed with urgency. A large number of maternal mortalities within developing countries is linked to low level of maternal healthcare, as shown by the low levels proportions of clients who attend the focused antenatal care services and the low number of maternal deliveries attended by skilled healthcare practitioners. Together with this is lack of proper selection of place of delivery as guided and recommended by qualified health care workers.

In Kenya, the situation is similar, with socio-economic and socio-demographic factors playing an important role in determining women's access to and utilisation of maternal health services. According to the Kenya Demographic and Health Survey, approximately 61% of women gave birth with the assistance of Skilled Birth Attendants (SBAs), although access to skilled delivery care varied considerably across socio-economic groups.[4] For instance, only 30% of women in the lowest wealth quintile delivered in health facilities, compared with 93% of women in the highest wealth quintile. This disparity highlights the significant influence of household economic circumstances on women's ability to access skilled delivery services.

Maternal education and household income are among the key socio-economic factors that may influence women's decisions regarding their choice of place of delivery. Higher levels of maternal education can improve women's awareness of the benefits of skilled birth attendance and strengthen their ability to make informed decisions about where to seek delivery care. Similarly, household income can affect the choice of delivery facility by determining a woman's ability to meet the direct and indirect costs associated with accessing maternal health services. Women from higher-income households may have greater flexibility to choose private or better-equipped health facilities, while those from lower-income households may face financial constraints that limit their options and make nearby or lower-cost facilities more accessible.

Several initiatives have been introduced in Kenya to improve access to maternal healthcare and encourage women, particularly those from rural and low-income households, to deliver in health facilities. These efforts include the provision of free maternal health services, health education, improvement and equipping of health facilities, and the construction of additional health facilities. Despite these interventions, the proportion of women accessing skilled care in health facilities remains a concern.[7] Previous studies have examined the Socio-demographic and Socio-economic factors associated with women's choice of place of delivery. Understanding these factors is important for healthcare providers and policymakers because it can help identify barriers that prevent women from accessing appropriate delivery services. Addressing socio-economic and socio-demographic disparities may therefore contribute to improved maternal healthcare service delivery, more equitable access to skilled birth attendance, and the development of policies that better respond to the needs of women across different communities.

Nairobi county recently developed hospitals, with the aim of increasing access to healthcare among its residents. However, some of them have not fully been adopted by communities. Tassia kwa Ndege hospital located in Embakasi East is among some of the recently constructed hospitals. This study assesses socio-demographic factors and their influence on the choice of place of delivery among mothers in Tassia kwa Ndege. It will provide insights to help in future planning and policy development with regards to maternal health.

## METHODS

### Research Design, Study Area and Period:

A cross-sectional study was carried out on women attending antenatal care at Tassia kwa Ndege Hospital, Embakasi East, Nairobi County, Kenya. A total of 290 respondents, 18 years and older and less than 45 years, were in this study. The study was carried out in June 2022 and August 2022.

### Study Setting and Population

Tassia, Embakasi East subcounty, is located within Nairobi County, Kenya. Located at Latitude: -1°18′31.36″ Longitude: 36°53′43.46″. It is situated at GPS coordinates 1° 18′ 17″ south and 36° 54′ 7″ east in Tassia. There are a total of 30,948 households in the area, and the land area stands at 2.5 sq. km with a population density of 35,196 persons per square km. Tassia is a suburb region that is located next to Donholm, Kwa Ndege and Nyayo estates. Embakasi constituency has 8 existing government health facilities that include Kayole 1, Kayole II, Mukuru, Umoja, Embakasi, GSU Embakasi, APTC Embakasi and Mukuru kwa Njenga to serve the entire population, and all refer pregnant women to only one facility, Mama Lucy Kibaki Hospital. New facilities were constructed to reduce the strain on Mama Lucy Kibaki Hospital; these facilities include Mukuru kwa Reuben, Our Lady of Nazareth in Mukuru kwa Njenga and Tassia kwa Ndege.

### Variables

The study examined factors influencing the choice of place of delivery, focusing on socio-demographic factors. Dependent variables were defined as the choice of place

of delivery: Tassia kwa Ndege vs. other health facilities. Independent variables in the study included age, level of education, marital status, parity, religion and decision maker.

### Sample Size Determination

The formula applicable for sample size calculation in this study is Fisher's formula n= $\frac{z^2 p(1-p)}{d^2}$

Since the target population is <10,000, the sample adjustment was done using the following formula (nf = 384 / 1 + 384 / 1125) to calculate the finite population correction factor and a sample size of 314. The final sample size attained in the study was 290, translating to a response rate of 92%.

### Sampling Strategy

Systematic random sampling was used in sampling mothers seeking antenatal care services at Tassia kwa Ndege Hospital. Women within the reproductive age between 18 and 49 years were targeted in the study. This design was most appropriate in obtaining a snapshot of the factors likely to influence the choice of place of delivery. Inclusion criteria for the study included women in their third trimester (28 weeks gestation), women who attended at least 2 or more antenatal care visits at Tassia kwa Ndege and resided in the area and aged between 18 and 49 years. Exclusion criteria for the study included women who had undertaken less than 2 visits at Tassia kwa Ndege hospital and did not reside within the study area. Women who were less than 18 and above 49 years and non-consenting mothers were excluded from the study.

### Data Collection

Data was collected using a structured questionnaire after informed consent was sought. The questionnaire contained both closed and open-ended questions. The questionnaire included socio-demographic characteristics such as age, marital status, parity, education level, religion, head of family and decision maker. The tool was pretested and administered by trained research assistants. Data collection tools were developed internally based on the study objectives. To ensure validity, the tools were reviewed by subject matter experts and pretested in a similar setting to enhance clarity and relevance. Reliability of the instruments was enhanced through standardisation of questions and consistent administration procedures.

### Data Analysis

Statistical analysis was performed using SPSS version 30. Data on age, education, parity, religion, marital status and decision-making were analysed through descriptive statistics. Inferential statistics and Chi-square tests were used to study the association between categorical socio-demographic variables and the choice of place of delivery (Tassia Hospital vs other hospital facilities). Age in this study was continuous, while the other variables were categorical. The results were represented with a confidence interval of 95%.

### Ethical Consideration

Permission was sought from the Amref Ethics and Scientific Review Committee (ESRC P1641/2024), the National Commission for Science, Technology and Innovation (License No. NACOSTI/P/24/35165), and the county health offices. Assent was obtained from participants below the age of 18, along with parental or guardian consent. Participants aged 18 and 19 years provided informed consent directly. To uphold confidentiality, all individuals who interacted with the research data signed a data confidentiality and agreement form. The research team also ensured that information shared during the interviews was not disclosed to third parties.

## RESULTS

### Demographic Characteristics

Table 1 below describes demographic characteristics of study participants. Out of the 314 targeted respondents, 290 mothers gave consent and participated in the study, yielding a response rate of 92%. Choice of place of delivery among mothers was found to be influenced by socio-demographics; this included age $P< .001$), education ($P< .003$), parity ($P< .001$), marital status ($P< .190$), religion ($P< .048$), head of family ($P< .001$) and decision maker ($P< .001$). These factors were found to influence decision-making by mothers in choosing Tassia kwa Ndege Hospital vs. other hospital facilities as their place of delivery.

**Age**: most respondents in the study were between the ages of 20 and 24 years, accounting for a majority of 138 (47.6%); the next biggest group was of mothers between the ages of 25 and 29, accounting for 88 (30.3%); while those above 40 years in the study were the least represented. The age of respondents in the study was found to have a significant influence on the choice of place of delivery ($P< .001$).

**Marital Status**: the majority of respondents (61%) were married and living with their husbands, while a minority of respondents (0.7%) were divorced or separated. Marital status did not have a significant association with choice of place of delivery ($P< .190$)

**Level of Education:** the majority of respondents (54.5%) had secondary education. A majority of the respondents in the study were literate, which indicated that mothers attending ANC services at Tassia kwa Ndege were fairly educated, and this largely influenced their choice of place of delivery.

**Parity:** A majority of respondents (57.2%) had no child birth prior to the clinic attendance, whereas a minority of respondents (0.3%) had 5 and 8 previous births, respectively. Parity among respondents in the study was found to have a significant influence on the choice of place of delivery ($P< .001$).

**Religious Affiliation,** majority of the respondents attending antenatal care at Tassia kwa Ndege identified with the protestant faith accounting for 113(39%), Catholics were the second largest group in the study accounting for 48 (16.6%). Only 2(0.7%) of the respondents did not identify with any religion in the study. Religion was found to have a significant influence on the choice of place of delivery among mothers in the study

**Decision Makers'** influence on choice of place of delivery, majority of the respondents (46.9%) indicated they made

**TABLE 1: Distribution of Study Participants by Socio-demographic and Household Characteristics and Associated Statistical Significance**

| Variable | Frequency | Percentage | Statistical significance |
|---|---|---|---|
| Age | | | |
| 15 - 19 | 18 | 6.2 | $\chi2 = 21.586$, df 5, $P < .001$ |
| 20- 24 | 138 | 47.6 | |
| 25-29 | 88 | 30.3 | |
| 30- 34 | 32 | 11.0 | |
| 35-39 | 12 | 4.1 | |
| 40 and above | 2 | 0.7 | |
| Education | | | |
| Primary | 55 | 19.0 | $\chi2 = 14.060$, df 3, $P < .003$ |
| Secondary | 158 | 54.5 | |
| More than Secondary | 76 | 26.2 | |
| IIIiterate | 1 | 0.3 | |
| Marital status | | | |
| Divorce/Separated | 2 | 0.7 | $\chi2 = 3.320$, df 2, $P < .190$ |
| Married/Living together | 177 | 61.0 | |
| Never Married | 111 | 38.3 | |
| Number of Children | | | |
| 1-3 | 116 | 40 | $\chi2 = 23.861$, df 6, $P < .001$ |
| 4-8 | 8 | 2.7 | |
| No child | 166 | 57.3 | |
| Religion | | | |
| African instituted churches | 15 | 5.2 | $\chi2 = 12.679$, df 6, $P < .048$ |
| Catholic | 48 | 16.6 | |
| Evangelistic churches | 79 | 27.2 | |
| Islam | 20 | 6.9 | |
| SDA | 13 | 4.5 | |
| Protestant | 113 | 39.0 | |
| No religion/Atheist | 2 | 0.7 | |
| Head of Family | | | |
| Self | 72 | 24.8 | $\chi2 = 21.322$, df 2, $P < .001$ |
| Husband | 178 | 61.4 | |
| Other | 40 | 13.8 | |
| Decision Maker | | | |
| Husband | 47 | 16.2 | $\chi2 = 31.594$, df 5, $P < .001$ |
| Husband Mother-In-Law | 1 | 0.3 | |
| Self | 136 | 46.9 | |
| Self-Husband | 65 | 22.4 | |
| Other | 40 | 13.8 | |

decisions themselves, while a minority of respondents (0.3%) indicated that decisions were made by others. As regards the family head, a majority of the respondents (61.4 %) acknowledged that the husband was the family head, while a minority of respondents (13.8%) indicated that the family was headed by others. The study revealed that Age, Parity, Level of Education, Religion and Decision makers significantly influenced mother selection on the choice of place of delivery.

## DISCUSSION

The purpose of this study was to examine the determinants influencing women's choice of place of delivery in Embakasi East Sub-County, Nairobi County, with particular focus on the utilisation of Tassia Kwa Ndege Hospital. The findings indicate that the relatively low utilisation of the facility for delivery services was associated with several maternal and household characteristics, including age, parity, level of education, religion, and healthcare decision-making patterns. These factors appear to shape women's perceptions, preferences, and decisions regarding utilisation of maternal healthcare services.

According to Andersen & Newman[8], determinants in the utilisation of health services can be grouped into three main categories that include: 1)Predisposing characteristics (demography, gender, age, marital status, social structure, education, occupation, hobby, race, religion and health belief) and 2) needs characteristics (individual and clinical assessment) and 3) enabling characteristics (family resources and community resources). The study further established that a majority of mothers preferred private and more established health facilities for delivery over Tassia Kwa Ndege Hospital. This preference may reflect differences in perceived quality of care, availability of services, reputation, accessibility, privacy, infrastructure, and responsiveness of healthcare providers. Choice of childbirth places among women has the ability to influence the rate of maternal mortality, which is a major challenge within developing countries.

The chi-square analysis revealed significant associations between women's socio-demographic characteristics and their choice of place of delivery. Maternal age, parity, education level, healthcare decision-making, and religion were identified as important factors, consistent with previous studies. The findings demonstrate that choice of delivery facility is influenced by a combination of individual, household, and socio-cultural factors.

Age was significantly associated with women's choice of place of delivery in the study. This finding is consistent with a study from India that found increasing maternal age was positively associated with health-seeking behaviour and utilisation of facility-based delivery services.[9] In the present study, older women were more likely to prefer established health facilities for delivery. This preference may be attributed to greater exposure to healthcare services, accumulated reproductive experiences, increased awareness of pregnancy-related risks, and greater confidence in evaluating the quality and reliability of available maternal health services. Previous experiences with pregnancy and childbirth may also enable older women to make more informed decisions regarding the selection of delivery facilities. The finding is further supported by studies conducted in Ethiopia and Nigeria, which reported significant associations between maternal age groups and choice of place of delivery. [10,11] The consistency of these findings across different settings suggests that maternal age may influence healthcare-seeking behaviour through a combination of experience, knowledge, perceived risk, and familiarity with health services.

Marital status was significantly associated with respondents' choice of place of delivery, indicating that maternal healthcare decisions may be influenced by household and social circumstances in addition to individual maternal characteristics. The finding is consistent with a study conducted in Kenya, which reported that marital status significantly influenced mothers' choice of place of delivery.[12] In the present study, married mothers were more likely to involve their husbands in decisions concerning the utilisation of maternal healthcare services, whereas single mothers were more likely to make these decisions independently. This difference may reflect variations in household decision-making structures, availability of social and financial support, and the extent of women's autonomy in making healthcare-related decisions. Similarly, evidence from Ethiopia demonstrated a significant influence of marital status on mothers' choice of place of delivery.[10] The consistency of these findings across different settings suggests that marital status may be an important social determinant of maternal healthcare utilisation, although its influence is likely to be mediated by factors such as household income, partner support, decision-making autonomy, and accessibility of health services.

Parity was significantly associated with the choice of place of delivery, suggesting that previous childbirth experience may influence women's subsequent maternal healthcare-seeking decisions. The finding is consistent with evidence from Uganda, where higher parity was associated with utilisation of maternal healthcare services.[11] In the present study, women with higher parity were more likely to make individual decisions regarding the utilisation of maternal healthcare services, which may reflect greater confidence arising from previous pregnancy and childbirth experiences. Women who have experienced uncomplicated pregnancies and deliveries may perceive themselves as having sufficient knowledge or experience to make decisions about subsequent births, potentially reducing their perceived need for facility-based care. Conversely, previous adverse childbirth experiences may encourage some multiparous women to seek skilled delivery services. Similar findings were reported in Ethiopia, where parity significantly influenced mothers' choice of place of delivery.[10] The observed association suggests that previous reproductive experiences may shape women's perceptions of pregnancy-related risks, their preferences for delivery care, and their subsequent healthcare-seeking behaviour. Consequently, maternal health interventions should recognise that multiparous women may have distinct perceptions and decision-making patterns and should continue to emphasise the importance of skilled birth attendance irrespective of previous uncomplicated deliveries.

Women's level of education was significantly associated with their choice of place of delivery. In the present study, women with higher levels of education were more likely to seek delivery services from private hospitals or higher-rated public health facilities within the study area. This finding may be explained by the role of education in enhancing women's health literacy, awareness of pregnancy-related risks, and capacity to evaluate and compare available maternal healthcare services. Higher educational attainment may also increase women's confidence and autonomy in making healthcare decisions, including decisions concerning where to seek delivery services. Educated women may be better positioned to recognise the benefits of skilled birth attendance, assess the perceived quality of different health facilities, and mobilise the financial and social resources required to access their preferred facility.

The findings are consistent with evidence from studies conducted across six African countries, which demonstrated that women with secondary or higher education were more likely to utilise health facilities for childbirth. Similarly, previous studies have reported a significant relationship between educational attainment and utilisation of health facilities for delivery. [11-15] Evidence from India also showed that mothers with higher levels of education were better equipped to make informed decisions concerning maternal healthcare.[9] The consistency of these findings across different geographical and socio-economic contexts reinforces the importance of education as a broader social determinant of maternal healthcare utilisation. However, the observed preference for private or higher-rated public facilities among more educated women may also indicate that education increases not only awareness of available services but also expectations regarding the quality, responsiveness, privacy, and reliability of maternal healthcare.

Religion was also significantly associated with the choice of place of delivery in the study. Muslim participants were more likely to deliver in facilities other than the government or private facilities commonly preferred by other respondents. This finding suggests that religious affiliation may influence maternal healthcare-seeking

behaviour through culturally defined beliefs, practices, preferences, and perceptions concerning pregnancy and childbirth. Religious norms may interact with other social factors, including family influence, gender roles, perceptions of appropriate healthcare environments, and preferences regarding the gender of healthcare providers.

The finding is consistent with evidence from South-East Asia, where religious considerations were reported to influence women's choice of place of delivery.[12] Other studies have similarly identified a significant association between women's religious affiliation and their choice of delivery facility. In particular, previous studies have reported that Christian women were more likely to deliver in government or private health facilities compared with Muslim women.[16-18] The consistency of these findings suggests that religious and cultural contexts may play an important role in shaping maternal healthcare preferences. Nevertheless, differences in religious affiliation should not be used to generalise healthcare-seeking behaviour among women, as substantial variation may exist within religious groups depending on socio-economic and contextual circumstances. Maternal health programmes should therefore adopt culturally sensitive approaches that recognise religious and community norms while ensuring that all women have equitable access to skilled and acceptable delivery services.

These interventions are particularly important in the context of Sustainable Development Goal 3 (SDG 3), which seeks to reduce the global maternal mortality ratio to less than 70 deaths per 100,000 live births by 2030 and end preventable deaths among newborns and children under five years of age.[2] Achieving these targets requires sustained investment in accessible, affordable, high-quality, and acceptable maternal and child health services. The findings of this study therefore reinforce the need for an integrated approach that combines improvements in health-system capacity with interventions targeting the social and behavioural determinants of maternal healthcare utilisation. Such an approach may enhance women's ability to make informed choices regarding place of delivery and ultimately contribute to reductions in preventable maternal and neonatal morbidity and mortality.

### Limitation

The limitation of the study was that the study was conducted among women living with Embakasi east at Tassia kwa Ndege, which limits its ability to generalise about women living within other sub-counties and the larger county.

## CONCLUSION

The study established that utilisation of Tassia Kwa Ndege Hospital for delivery services was relatively low among mothers attending antenatal care. Maternal education level and parity were significantly associated with the choice of place of delivery, suggesting that educational attainment and previous childbirth experiences may influence women's perceptions, decision-making, and preferences regarding maternal healthcare services. In contrast, marital status was not significantly associated with the choice of place of delivery, indicating that its influence may be context-specific and shaped by other socio-economic, cultural, and health-system factors.

The findings highlight the need to strengthen health education and counselling during antenatal care, particularly among women with lower educational attainment and multiparous mothers. ANC services should provide accessible and context-specific information on the benefits of skilled birth attendance, birth preparedness, danger signs, and the importance of timely access to appropriate delivery services. Community-based awareness and participatory programmes should complement facility-based interventions by empowering women and communities, addressing concerns regarding service quality and accessibility, and strengthening trust in available maternal healthcare services.

The study further underscores the importance of strengthening implementation of evidence-based WHO antenatal care recommendations and improving the continuum between ANC and delivery services. Health authorities should also consider local community needs when designing maternal health policies and programmes to ensure that services are accessible, affordable, acceptable, and responsive. Further research is recommended to examine how facility-level factors, including quality of care, cost, waiting time, infrastructure, privacy, respectful maternity care, accessibility, and availability of skilled personnel, influence women's choice between public and private delivery facilities in Nairobi County.

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