

RELATIONSHIP BETWEEN MATERNAL SOCIOECONOMIC STATUS AND ANTENATAL CARE UTILIZATION PATTERNS AT PUMWANI MATERNITY HOSPITAL, NAIROBI, KENYA

BY

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Abstract

Background: Antenatal care is essential for preventing maternal and neonatal complications, yet socioeconomic inequalities continue to affect its utilization. This study examined the relationship between maternal socioeconomic status and antenatal care utilization patterns at Pumwani Maternity Hospital, Nairobi, Kenya.

Methods: A convergent parallel mixed-methods design was used. The target population comprised 300 postnatal mothers and 60 pregnant women from the three trimesters. A sample of 6 purposively sampled pregnant women were selected for the qualitative work and 300 postnatal women were invited to participate in the questionnaire through the census approach, however, only 294 completed the questionnaire. Quantitative data were collected using structured questionnaires and analyzed using descriptive statistics and binary logistic regression. Qualitative data were collected through semi-structured interviews and analyzed thematically. The findings were integrated during interpretation.

Results: Of the 306 participants, only 300 responded, giving a 98.03% response rate. Maternal socioeconomic status was a significant positive predictor of adequate antenatal care utilization (odds ratio = 3.083, $p < 0.001$). The model explained 46.2% of the variation in utilization and correctly classified 81.3% of cases. Qualitative findings identified financial constraints, transport costs, employment conditions, and household economic responsibilities as important influences on antenatal care attendance.

Conclusion: Maternal socioeconomic status significantly influences antenatal care utilization. Addressing financial and access-related barriers, particularly among economically vulnerable women, may promote more equitable utilization of antenatal care services.

Keywords: Maternal Socioeconomic Status, Antenatal Care Utilization Patterns, Pumwani Maternity Hospital, Nairobi, Kenya.

Background

Maternal mortality remains a major global public health challenge, with an estimated 287,000 maternal deaths occurring worldwide in 2020, equivalent to approximately one maternal death every two minutes (WHO, 2023). In 2020, nearly 70% of these deaths occurred in Sub-Saharan Africa (WHO, 2023). Cresswell and colleagues suggest that some complications arising during pregnancy can be treated, managed, or prevented (Cresswell et al., 2025). Antenatal care (ANC) is one of the primary interventions recommended by the WHO for reducing maternal mortality (WHO, 2016). According to the

WHO, Antenatal Care (ANC) is defined as “the care provided by skilled health-care professionals to pregnant women and adolescent girls to ensure the best health conditions for both mother and baby during pregnancy. The components of ANC include risk identification; prevention and management of pregnancy-related or concurrent diseases; and health education and health” (WHO, 2016). However, for ANC to be effective, it is essential that women attend all clinics, receives the recommended services, and begins their first clinic visit early (WHO, 2016; Shattnawi et al., 2020). However, not all women have access to high-quality ANC care.

Evidence from low- and middle-income countries reveal that socioeconomic inequalities have a great influence on the ability of women to access maternal healthcare despite the development in healthcare infrastructure and service availability in these region (Rahman et al., 2024; Penman et al., 2023; WHO, 2023a). Maternal socioeconomic status, reflected in household income, employment, occupation, and wealth, influences women's ability to meet direct and indirect healthcare costs (Yaya et al., 2022). Women with greater economic resources are generally better able to afford transport and healthcare-related expenses, whereas those with limited resources may experience financial constraints, competing household needs, and other barriers that contribute to delayed or inadequate ANC utilization (Penman et al., 2023).

Globally, although approximately 87% of pregnant women receive at least one ANC visit, only about 70% complete four visits, with poorer women consistently reporting lower utilization than wealthier women (Rahman et al., 2024). Similar socioeconomic disparities are evident in Sub-Saharan Africa, where poverty and limited financial resources constrain timely initiation and continuity of ANC (Demissie et al., 2024). In East Africa, 54.4% of pregnant women attend at least 4 ANC visits and receive 21% of the recommended ANC services (Bobo et al., 2021).

Kenya reflects this broader pattern. Nationally, approximately 66% of pregnant women complete at least four ANC visits (Asiimwe et al., 2024), only 4% complete the recommended eight contacts, and 29% initiate ANC during the first trimester (Asiimwe, 2024). Although Nairobi County reports relatively high ANC coverage, socioeconomic disparities persist, particularly among women in low-income urban communities (Asiimwe et al., 2024; Kinshella et al., 2022). This indicates that expanding service availability alone may not ensure equitable ANC utilization.

The relationship between ANC utilization and socioeconomic status can be explored using the Anderson Behavioral Model of Health Service Utilization Li et al. (2023). According to the model, healthcare utilization, which includes ANC utilization, is influenced by enabling, needs, and predisposing factors. Needs factors are the actual or perceived need for healthcare services while predisposing factors are the individual characteristics that shape health seeking

behavior such as education and culture. Enabling factors are the resources that facilitate health seeking such as income, transport, and employment (Lederle et al., 2021). In the present study, socioeconomic status may influence ANC utilization through the woman's ability to meet indirect and direct ANC-related costs.

Pumwani Maternity Hospital, located in Nairobi County, is the largest maternity facility in East Africa, Kenya, and Nairobi (UNFPA, 2023; Gitonga, 2024). It serves a socioeconomically diverse urban population, including women from low-income communities who frequently face limited financial resources and unstable livelihoods (Kinshella et al., 2022). Despite the availability of ANC services, variations in the timing and frequency of attendance have been reported (Miriti, 2023), suggesting that socioeconomic (SES) circumstances may influence utilization. Existing studies have examined ANC utilization at national level or between rural and urban areas but we have limited studies that have focused the on the influence of SES on antenatal care utilization patterns among mothers attending Pumwani Maternity Hospital, the largest maternity referral hospital in East Africa and a facility serving women from diverse socioeconomic backgrounds. In addition, there are limited studies on how SES influence ANC utilization at Pumwani Maternity Hospital. This contextual and empirical gap necessitated the present study, which examined the relationship between maternal socioeconomic status and ANC utilization patterns at Pumwani Maternity Hospital, Nairobi, Kenya.

Methodology

This study employed a convergent parallel mixed methods design to examine the relationship between maternal socioeconomic status and antenatal care utilization patterns at Pumwani Maternity Hospital, Nairobi, Kenya. The target population comprised 360 participants made up of 300 postnatal mothers with infants aged below three months and 60 pregnant women attending ANC and at different trimesters. A sample of 6 purposively sampled pregnant women from different trimesters was taken through the qualitative interview guide. In addition, 300 postnatal mothers selected through census method for all the eligible women to engage quantitatively but only 294 participants completed the questionnaire. One woman withdrew from the interview process without a reason, and the rest did not respond to important sections of

the questionnaire. Women were recruited during clinic days, and the interviews took place in the hospital compound.

Data were collected concurrently using a structured questionnaire for postnatal mothers and semi-structured interview guides for qualitative participants. Quantitative data were analyzed using SPSS Version 29. To analyze participants' characteristics, descriptive statistics were used while binary regression assessed the association between adequate ANC utilization and socioeconomic status. Since a single variable predictor was used in the logistic regression model, multicollinearity diagnostics were not applicable. Hosmer-Lemeshow was used to evaluate the model fit. Qualitative data was transcribed then the data was imported to NVivo 15 for management and coding. The codes were generated from the data then grouped to form themes which captured the women's perspectives and experiences on factors influencing ANC utilization at Pumwani Maternity Hospital. Integration occurred during interpretation by comparing statistical results with qualitative themes to

identify convergence, complementarity, and divergence. The mixed-methods approach enabled the study to quantify the socioeconomic-ANC utilization relationship while explaining the experiences and contextual factors underlying the observed patterns.

Results

A total of 300 of 306 participants responded, giving an overall response rate of 98.03%. The quantitative component had a response rate of 98.0% (294/300), comprising women with babies less than 3 months. For the qualitative component, it had 100% response rate, and it included 6 pregnant women representing the three trimesters. Among the 294 postnatal mothers, self-employment was the most common occupational category (171, 58.2%), followed by formal employment (50, 17.0%), unemployment (47, 16.0%), and casual employment (26, 8.8%). This characteristic demonstrate that majority of the participant were self-employed which could be associated with limited employment benefits and unstable income. The conditions may lead to inconsistency in utilizing ANC care.

Table 1: Occupation of Postnatal Care Client Participants (n = 294)

Occupation status	Frequency (n)	Percentage (%)
Self-employed	171	58.2
Formally employed	50	17.0
Unemployed	47	16.0
Casual employment	26	8.8
Total	294	100.0

Among respondents who provided information on spouse occupation (n = 170), 53 (31.2%) reported formal employment, 48 (28.2%) casual employment, 46 (27.1%) unemployment, and 23 (13.5%) self-employments. Majority (60%) of the spouses were unemployed and on casual employment and thus might have experienced income insecurities and may have affected their ability to support the participant to seek ANC care.

Table 2: Spouse's Occupation (n = 170)

Occupation	Frequency (n)	Percentage (%)
Formal employment	53	31.2
Casual employment	48	28.2
Self-employment	23	13.5
Unemployed	46	27.1
Total	170	100.0

The women also identified barriers that hindered them from utilizing ANC services. Distance (16.3%, family (17.7%), and work (12.9%) were among the barriers, However, 31.3% could not identify any specific barrier for their ANC utilization. The findings demonstrate that social as well as economic barriers influence ANC utilization despite the service availability.

Table 3: Barriers for ANC utilization

Main Barrier	Frequency (n)	Percent (%)
None	92	31.3
Cost	64	21.8
Distance	48	16.3
Family	52	17.7
Work	38	12.9
Total	294	100.0

ANC attendance was variable and the results show that only 9.5% of the participants attended 8 ANC clinics, 4.1% did not attend ANC, and 68% attended 4 or more ANC clinics. These demonstrate that although ANC services were available majority of women did not attend all the recommended scheduled clinics.

Table 4: Number of ANC Visits During Current Pregnancy

Statement	Frequency (n)	Percent (%)
0 visits	12	4.1
1 visit	18	6.1
2 visits	26	8.8
3 visits	38	12.9
4 visits	54	18.4
5 visits	46	15.6
6 visits	44	15.0
7 visits	28	9.5
8 visits	28	9.5
Total	294	100.0

Participants who sought ANC services had access to the 8 recommended ANC services, but not all women utilized all the services. Majority of the women received iron tablets/folic acid (96.9%), blood pressure measure (92.5%), and HIV test/ counseling (91.2%). However, ultrasound (74.8%) was the least utilized service among the participants.

Table 5: Antenatal Care Services Received

Service	Frequency (n)	Percent (%)
Blood pressure measured	272	92.5
Urine tested	248	84.4
Blood tested	260	88.4
Iron tablets/folic acid	285	96.9
Tetanus injection	240	81.6
HIV test/counselling	268	91.2
Ultrasound scan	220	74.8
Nutrition advice	256	87.1
Total (Respondents)	294	100.0

Maternal Socioeconomic status and ANC utilization

For the quantitative findings, women were considered as having adequate ANC utilization if they received most of the ANC services and attended four or more clinics. For those who attended less than four clinics or received fewer ANC services were considered as having inadequate ANC utilization. Therefore, ANC utilization was operationalized as a binary variable.

Binary logistic regression showed a statistically significant association between maternal socioeconomic status and adequate ANC utilization ($B = 1.126$, Wald = 16.63, $p < 0.001$). Women who had a higher socioeconomic status were three times more likely to utilize ANC more adequately compared to

women with a lower socioeconomic status. The odds ratio was 3.083 (95% CI: 1.79–5.31).

The regression model explained 46.2% of the variation in ANC utilization (Nagelkerke $R^2 = 0.462$). The Hosmer–Lemeshow test was non-significant ($p = 0.684$), and the model correctly classified 81.3% of respondents.

Although maternal socioeconomic status measured various indicators such as household income, employment status, occupation, and financial protection through health insurance, a composite SES index was generated by combining the indicators. The index was preferred since the indicators are closely related. The single index was used in the binary regression analysis.

Table 6: Logistic Regression of Maternal Socioeconomic Status and ANC Utilization

Predictor	B	S.E.	Wald	df	p-value	OR	95% CI
Maternal socioeconomic status	1.126	0.276	16.63	1	<0.001	3.083	1.79–5.31
Constant	-2.418	0.521	21.53	1	<0.001	0.089	—

In the logistic regression, binary classification was the dependent variable in examining how socioeconomic status influence ANC utilization. Since only one predictor was used, multicollinearity was not applicable in the logistic regression model.

To better understand how socioeconomic status influenced ANC utilization, qualitative findings were incorporated into the quantitative findings under the four themes identified below.

Theme 1: Financial constraints and competing priorities

The quantitative findings demonstrated that women from a higher socioeconomic status were more likely to utilize ANC services than those of the lower status. Also, they showed that, only 17% of the women and 31.2% of their spouses were formally employed meaning a small proportion of the participants had consistent income. This is explained by the qualitative findings which explained that due to limited household income and inconsistent income, families prioritized needs. Food and rent were more prioritized thus placing clinic-related costs after the mentioned needs were met. This meant that the mothers attended ANC only if they had met their most basic needs. Some of

the clinic-related costs included paying for pregnancy-related tests, consultation fee, and transport costs. Unfortunately, some mothers missed clinic or did not conduct all the pregnancy-related tests such as ultrasound tests. This is consistent with the quantitative findings which reveal that ultrasound was the service that had the least uptake at 74% utilization. One mother explained:

“Sometimes I knew I was supposed to go for clinic, but if I had to choose between paying transport and buying food for my children, I chose food first.”

And another one said:

“My husband has informal employment, and I am currently not engaging in any tedious work. So, whatever we have is for the basic needs then when we have extra, I go for clinics. Clinic is important because of my condition, but when I do not have money, I trust God to keep me safe”

“My spouse and I agreed that we I will not go for the ultrasound but should keep attending the clinic until we get money to pay for it.”

These findings demonstrate how economically disadvantaged women missed seeking care even though they recognized its importance.

Theme 2: Transport cost as a barrier

Transport was an indirect cost, and it influenced utilization of ANC services as seen in the findings where 16.3% of women highlighted it as a barrier to care. Participants appreciated that although the cost of care was affordable for some of them, the cost of transport increased the burden of cost for others. This was particular to women who sought specialized care from Pumwani maternity hospital after a complication or due to referral from another hospital. The women were keen to attend all the recommended clinics amidst the financial constraints as explained by the mothers below:

*"I was referred to Pumwani from *** after losing my first pregnancy due to hypertension. This time I decided to attend all clinics. Sometimes we borrow money from relatives and friends for transport. Last time we walked to the hospital with my husband, but I was too tired. Unfortunately, I missed the third clinic since we didn't have extra money for transport, and I could not walk all the way to the clinic."*

"I feel so good when my husband or I get some casual work before the clinic since it assures me of fare. We pay the government health insurance, so my only challenge is transport."

3. Opportunity cost of seeking care

A large percentage of women were self-employed (58.2%) and a small percentage of 8.8% relied on casual employment. The women explained that when they missed work for clinic, it meant they also missed income for that day. For single women, they explained that they would reschedule their clinics to a day when they did not expect high number of customers in their business. For one participant who was a hairdresser, she always postponed the clinic to any Monday as long as she did not have a prior booking from a client. For women with complications, this created a dilemma between economic survival and healthcare utilization. Majority of the women ended up missing the clinics and attending after a month. Quantitatively, only 9.5% of women attended 8 clinics and 46.2% attended at least 4 ANC clinics. In addition, 12.9% of the

participants cited work as a hindrance to ANC utilization.

"I wash clothes for people, so I work any day besides on Sunday and I must start at 8am. It is always difficult for me when a client invites me for a job on my clinic day since clinic ends by midday so I cannot attend clinic after washing clothes. Sometimes I just miss the clinic just so that I can make a living whenever I get an opportunity"

"I rarely have clients on Monday, so I like going to the clinic on Monday's. However, during high seasons, I rarely attend clinics."

"My boss gives us only one leave day on weekdays after two months unless you are sick but not for clinics. I cannot lose my job due to clinics so I know I will only attend 4 clinics then I deliver, and I am fine since I need the wages and cannot afford to lose the job."

4. Decision-making and dependence

Women reported that clinic attendance was also influenced by the decision-making arrangement in their homes. In situations where women did not have finances, they relied on their spouses for fare and cost of care. Thus, their utilization depended on decision by their spouse to provide the money. However, this was different for women who were formally employed or who made decisions on their health seeking.

As participants shared:

"My partner allows me to make decisions on clinics, so I have been attending all clinics"

However, 17.7% of the women considered family as a barrier to ANC utilization. The women explained that family members influenced when they start the clinic and some services they receive. For one participant, the mother-in-law was against ultrasound, so she decided not to have it. Also, additional care seeking responsibilities for women who had younger children also hindered them from consistently seeking care when they did not receive sufficient support to care for the other children to allow her to go for clinics. Sometimes it was support in paying daycare for them while at other times, it was an extra person to accompany them during clinics.

"My sister helps me to watch the young boy during clinic days, but when she is not available, I carry him on my back. Since I am about to deliver, I am unable to carry him, so I

missed my clinic on Monday until I find someone to leave the baby with."

"My partner did not understand why I wanted to start clinic three months into the pregnancy, so I started when I was five months pregnant."

"When my husband has money, we pay daycare for the twins so that I go for clinic without worrying about taking them with me for clinics."

The findings from the study are consistent with the Anderson model which propose that enabling, needs, and predisposing factors influence healthcare utilization (Lederle et al., 2021). In this study, the socioeconomic status, which is under the enabling factors operated through transport affordability, access to social support, household income, and employment conditions. The factors either enabled or hindered ANC utilization despite the woman's knowledge of the importance of ANC.

Discussion

The principal finding of this study is that maternal socioeconomic status is an important determinant of ANC utilization at Pumwani Maternity Hospital. The quantitative analysis demonstrated a significant positive association between socioeconomic status and adequate ANC utilization, while the qualitative findings provided an explanation of the mechanisms underlying this relationship. Together, the findings indicate that women's ability to utilize ANC is influenced not simply by the availability of services but also by their capacity to meet the economic and practical costs of accessing care. These findings are consistent with Anderson Model which identified enabling factors such as financial resources among factors that influence healthcare utilization (Pengid et al. 2022; Hajek et al. 2021; Lederle et al., 2021).

The Anderson model identifies enabling factors such as income and financial resources as either enablers or barriers to healthcare utilization (Pengid et al. 2022). This is consistent with the study as it found that women with limited or unstable income had challenges meeting the ANC-related direct and indirect costs. This delayed or led to missed care for the women. The small percentage of employed women and spouse meant that a larger percentage of the participants faced income instability and insecurity which led to prioritization of needs. Families often prioritized buying food and paying rent over ANC related costs.

These findings are consistent with a study (Ataguba et al., 2021; Ataguba et al., 2023) which found that low socioeconomic status and low income led to reduced ANC utilization and consequently resulted in poor pregnancy outcomes (Mekonnen et al., 2021). Similarly, Gube et al. (2024) reported on the influence of wealth inequalities among women from low and high wealth categories on maternal healthcare utilization. He found that women from more financially stable families utilized ANC more than the women who were less financially stable. Inequalities in finances have also been reported in other studies and connected that women facing financial constraints are less likely to receive adequate ANC services (Demissie et al., 2024; Aboagye et al., 2025; Najjuuko et al., 2025).

The present study also reported that participants with limited resources prioritized survival over preventive healthcare services. These findings were also reported by (Tamir et al., 2025; Lateef et al., 2024) who found that women with constrained resources invest less in preventive healthcare services such as ANC. Therefore, low ANC utilization among families with inconsistent and limited resources is not only a result of affordability challenges but also a difficult trade-off that women make when faced with limited resources.

Transport costs emerged in a significant indirect way that socioeconomic status influenced ANC utilization. Although Pumwani Maternity Hospital is in an urban setting, transport cost was a significant challenge. In the Anderson Model, indirect costs such as transport costs in healthcare access are classified under the enabling factors which influence healthcare utilization (Hajek et al. 2021). Although the women understood the importance of the ANC services, reaching the services was sometimes challenging. Studies in East Africa have consistently reported transport cost as a barrier for initiation, timely attendance, and continuity of ANC (Bobo et al., 2021; Demissie et al., 2024; Mzembe et al., 2023). In Kenya, (Asimwe et al., 2024) frequently reported that women missed care or experienced delays in care even for those living close to the hospitals due to transport challenges. However, women have different perceptions about the transport cost and those from lower socioeconomic status were more burdened because the cost represented a substantial proportion of their disposable income (WHO, 2023; World Bank, 2023; Penman et al.,

2023). These findings emphasize that indirect costs such as transport have a significant influence on ANC utilization, besides direct costs such as the cost of ANC-related tests.

Majority of women from the present study were self-employed and the qualitative data reveal that clinic attendance meant lost income for the day. In sub-Saharan Africa, women in informal employment have been reported to delay health seeking in cases where it interfered with their daily income generation (Yaya et al., 2022; Demissie et al., 2024; Mzembe et al., 2023). Beyond loss of income, the women in casual employment and small-scale businesses also find it challenging to balance their livelihood responsibilities with healthcare utilization (Asiimwe et al., 2024). While in some case the costs of care could be affordable or covered by insurance, the lost time from work, long waiting time in hospital, and lost income contribute to inadequate utilization of ANC especially among women with low resources (Tamir et al., 2025; Lateef et al., 2024). Consequently, for women in informal employment, healthcare utilization is an opportunity for those who face unpaid leave, lack of employment protection, and work under strict schedules (Rahman et al., 2024; Lateef et al., 2024; Gube et al., 2024). The conditions of employment for the formally and casually employed women such as the leave days, income security, and work flexibility are aspects of enabling factors according to the Anderson Model (Hajek et al. 2021) Socioeconomic status influences the utilization of ANC through both employment-related constraints and financial capability as explained by the Anderson model (Lederle et al., 2021).

The findings from the study demonstrate the need for a woman's decision-making and autonomy power. Studies from Sub-Sharan Africa have reported that women with greater decision-making and autonomy power participate better in healthcare utilization. This is because they are empowered to seek timely care without dependence on financial and approval support from someone else (Sabo et al., 2024; Lateef et al., 2024; Dinagde et al., 2024). In addition, they initiate the ANC early, receive quality care, and the recommended ANC services compared to women with limited powers (Aboagye et al., 2025; Najjuuko et al., 2025). Women empowerment, family support either in decision, finances, caregiving, and household

responsibilities lead to improved ANC utilization. Conversely, when the care is missing, it leads to delayed or missed care seeking (Asiimwe et al., 2024). Indeed, Anderson displays a woman's dependency on family members and their autonomy in decision-making as enabling and social factors. In addition, he agrees that ability for the woman to make health-related decisions independently and access to resources influence maternal health seeking such as ANC utilization (Lederle et al., 2021).

Limitations

This study has several limitations that should be considered when interpreting the findings. First, the study was conducted at a single maternity hospital, which may limit the generalizability of the findings to other healthcare facilities or populations with different socioeconomic and healthcare contexts. Second, the quantitative component used a convergent **parallel mixed-methods design**, meaning that the observed association between maternal socioeconomic status and ANC utilization cannot be interpreted as a causal relationship. Third, socioeconomic status and ANC utilization were assessed using participant-reported information, which may be affected by recall or reporting bias, particularly when reporting income, employment, or previous ANC attendance. In addition, the qualitative component involved a relatively small purposively selected group of participants; therefore, the views expressed may not represent all women. Finally, the regression model did not adjust to the confounding variables such as distance to health center, pregnancy intention, maternal, age, marital status, and education. Therefore, the analysis may be partially influenced by omitted variable bias as it only reports the association between ANC utilization and socioeconomic status. Despite these limitations, the convergence of quantitative and qualitative findings provides useful evidence on the relationship between socioeconomic circumstances and ANC utilization at Pumwani Maternity Hospital.

Conclusion

The study concludes that maternal socioeconomic status significantly influences ANC utilization at Pumwani Maternity Hospital. Higher socioeconomic status was associated with greater likelihood of adequate ANC utilization, while financial constraints, transport costs, employment conditions, and household responsibilities led to lower ANC utilization. The

findings highlight the need for interventions that reduce socioeconomic barriers to ANC, particularly through financial protection and improved access support. Further research should examine additional social and health-system factors influencing ANC utilization.

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