

Research



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Effect of socio-demographic factors on focused antenatal care services utilization among pregnant women at an informal settlement health centre in Nairobi, Kenya

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Abstract

Introduction: Focused Antenatal Care (FANC) is important in standardising maternal health. FANC utilisation involves examining the sufficiency of the number of visits and the maternal healthcare services that expectant women receive. The study examined the effect of socio-demographic factors on FANC services use among expectant women at Lunga Lunga Health Centre, Nairobi County, Kenya. **Methods:** a cross-sectional study design was adopted to source and analyze data. The study targeted 935 expectant women in their third trimester seeking FANC services at Lunga Lunga Health Centre, of whom 272 were randomly selected to participate in the study. Data was sourced based on a structured questionnaire and data collection sheets. Frequency distribution, percentages, and multivariate binary logistic regression were used in data analysis. **Results:** findings showed that 9.9% of the 272 expectant women made at least 8 FANC visits to Lunga Lunga Health Centre. Multivariate binary logistic regression revealed that expectant women who had multiple parities (AOR= 0.163, 95% CI= 0.07 - 0.37, $p < 0.05$), had no spouses (AOR= 0.27, 95% CI= 0.12 - 0.60, $p < 0.05$), were Muslim (AOR= 0.11, 95% CI= 0.01 - 0.87, $p < 0.05$) were less likely to receive the recommended 8 FANC visits. **Conclusion:** the low level of FANC utilisation among expectant women from the informal settlement is attributed to socio-demographic predictors such as marital status, parity, and religion. The findings suggest sensitisation efforts to encourage women on the merits of adequate FANC utilisation. Further research should consider other predictors of FANC utilisation and target more health facilities to improve generalisation of the findings.

Introduction

Focused antenatal care (FANC) aims to enhance antenatal visits to 8, which in turn improves antenatal care. These services include risk identification and screening, promotion of

expectant mothers' education, and prevention and management of maternal morbidity. Focused antenatal care enables women to learn from skilled health care providers about positive behaviour while pregnant, understanding danger signs related to pregnancy and childbirth, as they receive psychological support. Expectant women also access micronutrient and iron supplementation, and blood pressure monitoring to prevent eclampsia. They also received tetanus toxoid immunization to guard the foetus against neonatal tetanus [1]. Approximately 86% of pregnant women worldwide visit an antenatal clinic at least once during the pregnancy, whereas 62% adhere to the WHO-approved guideline of a minimum of 8 visits.

Despite its advantages, the implementation of FANC faces challenges in sub-Saharan Africa. Most developing countries in Africa tend to have elevated maternal deaths, and few women complete FANC at 52% and 49%, respectively [2]. Studies have identified various barriers to FANC utilization, with socio-demographic factors being among the leading factors. For instance, individuals at the lower end of the socioeconomic class encounter obstacles, including restricted access to healthcare services and financial limitations, which hinder their capacity to fully utilize FANC services [3]. A study conducted in Ghana revealed that spirituality strongly predicted the care provided to expectant women in Ghana, as many women integrate religious artefacts and rituals into their prenatal and labour experiences [4]. A comprehensive review indicated that older women were more likely to participate in at least four antenatal care (ANC) visits compared to their younger counterparts. Conversely, younger maternal age was linked to an earlier start of ANC, as younger women often began their care in the first trimester [5]. Another study by Konlan *et al.* [6] indicated that women who had experienced more previous births were less inclined to attend the advised number of ANC appointments.

Kenya has implemented the World Health Organization (WHO) - FANC program and developed new guidelines that emphasize birth preparedness as well as the diagnosis and management of conditions that threaten life during pregnancy and immediately after childbirth [7]. The Ministry of Health has embraced the WHO guideline of providing eight ANC visits during pregnancy to improve outcomes for mothers and newborns. The recommended schedule for these visits is as follows: Before 16 weeks of gestation, the first appointment for a thorough evaluation, which encompasses a review of medical history, a physical examination, laboratory tests, and the initial ultrasound. Twenty (20) to 24 weeks: second visit with an anomaly scan to assess foetal development and placental position. Twenty-six (26) to 28 weeks: third visit involving random blood sugar testing to screen for gestational diabetes. Thirty (30) to 32 weeks: fourth visit to monitor ongoing health, introduce Lamaze classes, and possibly conduct additional blood tests. Thirty-four (34) weeks: fifth visit to continue health assessments, offer optional Lamaze classes, and perform an optional third ultrasound. Thirty-six (36) weeks: sixth visit to evaluate the baby's position and discuss labour and delivery plans, with an optional gynaecology consultation. Thirty-eight (38) weeks: seventh visit focusing on education about labour, delivery, and general welfare, often referred to as the birth preparedness clinic. Forty (40) weeks: eighth visit to review signs of labour and when to contact the hospital or midwife [8].

Despite the adoption of FANC in Kenya, studies have shown that the uptake is still low. A study conducted in Murang'a County, Kenya, revealed that 37.3% of expectant women never used FANC health services [9]. Research conducted in Kilifi County similarly revealed a lack of awareness and low utilisation of FANC services among women. A study undertaken in Kilifi County similarly revealed a lack of adequate knowledge and poor use of FANC services among expectant women. Factors such as limited knowledge about FANC, cultural beliefs, and accessibility issues were significant

barriers to adequate antenatal care [10]. It's concerning that even though the reproductive health policy and efforts to encourage the proper use of FANC services are in place, the response is not as expected. Thus, there remains a significant poor adoption of these services. The study had two objectives: a) to assess FANC service utilization among expectant women seeking services at Lunga Lunga Health Centre, Nairobi County, Kenya; b) to find out socio-demographic factors contributing to adequacy of FANC service utilization among expectant women seeking services at Lunga Lunga Health Centre, Nairobi County, Kenya. It intends to guide the formation of targeted interventions and guidelines that enhance the availability and usage of specialized antenatal care services.

Methods

Design, study area: a cross-sectional study design was adopted in examining the effect of socio-demographic factors on FANC services use among expectant women accessing services at the Lunga Lunga Health Centre in Nairobi County, Kenya. Lunga Lunga Health Centre is located in the Viwandani ward in Makadara sub-county, Nairobi, Kenya. The facility mainly supports patients, among them expectant women from informal settlements, especially Sinai, Mukuru Kwa Reuben, Kingstone area, and Mukuru Kwa Njenga, among others. The study was carried out at the ANC clinic at Lunga Lunga Health Centre. According to KDHS 2022, the facility's catchment population is 27,498, of which women of childbearing age between 15 and 25 years stand at 5802. The hospital remains one of the busiest health facilities serving approximately 200-300 expectant women per day, attending to FANC services [11]. The population around the hospital is challenged as regards access to health services in general and FANC services in particular. Therefore, a study on socio-demographic factors affecting FANC services at Lunga Lunga Health Centre was necessary.

Study population, sampling, and recruitment: the estimated number of expectant women visiting

Lunga Lunga Health Centre stands at 935. The hospital remains one of the busiest in the Makadara sub-county in terms of maternal care. Expectant women in their third trimester seeking FANC services at Lunga Lunga Health Centre were targeted in this study. Pregnant women with pregnancy complications seeking FANC services at the hospital were excluded from the study. Additionally, pregnant women who did not give consent were excluded from the study. The sample size was achieved through Cochran's formula [12].

$$n = \frac{Z^2 pq}{e^2}$$

Where: n is the sample size, e is the desired level of precision, Z is the standard normal deviation, set at 1.96 at a 95% level of significance, p is the estimated proportion of an attribute present in the population, set at 0.5 if unknown, as in this case, and q is 1-p [12]. The formula generated a sample size of 385, after which a small sample correction was undertaken, where N was the target population. The adjusted sample size of 272 was thus arrived at through the formula:

$$n = \frac{n_0}{1} + \frac{n_0 - 1}{N}$$

A systematic random sampling method with the use of ANC registers was used in this study. The ANC register, dating back to eight months, was reviewed to identify all expectant women who were in their third trimester and were utilising FANC services at Lunga Health Centre. This was necessary to identify all expectant women who were in their third trimester, to be able to identify their FANC utilization. Relevant data information collected from the selected pregnant women's records from the ANC register included details about their FANC utilization, such as the number of visits, the first visit during pregnancy, tests conducted, medication prescribed, and any education or counselling provided. Further, the women were invited to participate in a survey. In

cases of challenges such as non-respondents or refusal to participate, sampling registers were re-checked, and the selection of the next "3rd" eligible individual in attendance register was made to participate in the study.

Data collection instruments and operationalisation:

a closed-ended questionnaire and data collection sheet served as the means of collecting quantitative data. The structured questionnaire was designed to source data on socio-demographic features of the expectant women, including parity, age, religion, and marital status. The data collection sheets were designed to collect FANC utilization adequacy by the expectant women as recorded in the hospital ANC register. The FANC utilization data targeted were the number of FANC visits and the trimester in which the first FANC visit happened. The data collection tools were pretested among 28 expectant women in their third trimester visiting the Lunga Lunga Health Centre. The pre-study was undertaken to examine the reliability and validity of the data collection tools as recommended by Mugenda and Mugenda [13]. The responses during the pre-study were used to evaluate the appropriateness of the data collection tools in collecting the needed data to achieve study objectives. Errors identified in the process were adjusted and corrected before the final tools were developed for the actual study. The study also sought the opinion of the public health experts, including the supervisors, in examining the validity of the survey questionnaire and the data collection sheet. The refined questionnaire was converted to Google Forms, where links to the form were accessed via tablets by trained research assistants. The questionnaires were administered orally to respondents by the research assistants. The responses were keyed into the data collection tablet, where the Google Forms were opened. Additionally, data collection sheets were adopted to source data on FANC utilization from the hospital ANC records. The data on FANC utilization was also keyed into the tablet, awaiting processing and analysis. The operationalization of study variables is given in Annex 1.

Data processing: the responses from the study participants were keyed into the Google form and immediately received by the principal researcher in the Google space. The data on the Google server was downloaded in Microsoft Excel format for further exploration using the Statistical Package for Social Sciences version 25. Quantitative data underwent initial analysis using descriptive statistical methods, which included calculating frequencies and percentages. Before regression was undertaken, diagnostic tests were undertaken, including multicollinearity and goodness of fit. Multivariate binary logistic regression was adopted to examine whether the socio-demographic factors predicted FANC services. The factor predicted FANC use adequacy if the p-value was less than 0.05 level of significance. The findings were presented using Tables and graphs and associated narrations.

Ethical considerations: ethical approval was obtained from Amref ESRC [ESRC P1690/2024]. After this, a research permit was obtained from NACOSTI [NACOSTI/P/24/39973]. Lunga Lunga Health Centre administration approved the study through the Makadara Sub-County Health Management Team (SCHMT). The specifics of this research were communicated to each participant, and informed consent was obtained from those who volunteered. Additionally, an assent form was requested from participants under the age of 18. Participants who chose to withdraw at any stage of the study were allowed to, and their data were expunged from the analysis stage. Participants were assured of privacy, anonymity, and confidentiality. Access to sensitive data was restricted via the use of passwords; only authorised individuals, like research assistants, would access it as they were bound by a confidentiality agreement. Further, the data collection was undertaken in a room without interference from other parties. A phone number was shared with the participants in cases of withdrawal requests. The study did not have direct compensation. Participants accessed supportive services, such as referrals to healthcare services, if

they showed need or concerns related to their pregnancy.

Results

The survey questionnaire was completed by 272 expectant women visiting the Lunga Lunga Health Centre for various FANC services.

Socio-demographic characteristics: the finding (Table 1) showed that 64.3% of the expectant women in the survey were aged 23 years and above, with the remaining 35.7% being 22 years and below. Further, 77.6% of the expectant women in the survey were either married or cohabiting with spouses, with the remaining 22.4% being either single, separated, or divorced. Additionally, 96.3% of the expectant women were Christians, with the remaining few being Muslims. Finally, 69.1% of the respondents had a parity of 2 and above, with 30.9% having a parity of 1.

Focused antenatal care (FANC) services utilization: the analysis of data revealed that only 9.9% of the expectant women in the study had made the recommended eight visits to the hospital for ANC health services, with the remaining majority (90.1%) failing to do so. Therefore, overall FANC utilization was low among expectant women visiting the Lunga Lunga Health Centre. The study also evaluated the first visit by the expectant women to the hospital for FANC services. The majority (67.3%) of the expectant women had first visited the hospital for FANC services late in their pregnancy (2nd and 3rd trimesters). In this regard, only 32.7% had visited the hospital earlier in their first trimester (Figure 1).

Socio-demographic factors affecting FANC utilization adequacy: the study undertook diagnostic tests to establish the robustness of the binary logistic model. The finding showed that the model did not suffer from multicollinearity, given the variance inflation factor (VIF) values lower than 10: marital status (1.158), age (1.616), parity (1.816), and religion (1.031). Further, the Hosmer-

Lemeshow test showed that the model had a good fit ($p < 0.05$). The logistics regression results in Table 2 showed that the marital status of the expectant women significantly predicted their FANC utilization and that expectant women without spouses were 0.27 times less likely to access the essential minimum of FANC services in comparison to their married counterparts (AOR= 0.27, 95% CI= 0.12 - 0.60, $p < 0.05$). Parity significantly affected FANC utilization rate among pregnant women, with expectant women who had a parity of at least 2 being 0.16 less likely to use the required minimum of 8 FANC visits in comparison to their counterparts who had a parity of 1 (AOR= 0.16, 95% CI= 0.072 - 0.372, $p < 0.05$). The religion of expectant women significantly explained their FANC utilization such that those who professed Muslim faith were 0.11 less likely to use the required minimum of FANC visits in comparison to their Christian counterparts (AOR = 0.11, 95% CI= 0.014 - 0.877, $p < 0.05$). However, the age of the expectant women did not significantly predict the utilisation rate of FANC services.

Discussion

The findings revealed that 9.9% of the expectant mothers had received the required 8 FANC visits in the course of their gestation. Therefore, overall FANC utilisation was low among expectant women visiting the Lunga Lunga Health Centre. The finding is consistent with Gitonga [14], who noted that below 50% of expectant women in Tharaka Nithi county, Kenya, meet the required 8 FANC visits. Further, 67.3% of the expectant women had first visited the hospital for FANC services late in their pregnancy (2nd and 3rd trimester). In this regard, only 32.7% had visited the hospital earlier in their first trimester. The finding agrees with Nima *et al.* [15], who established that the majority of expectant women visiting Median Hospital for FANC services visited late in their pregnancy. After examining the FANC utilization rate, the study evaluated the effect of socio-demographic factors on FANC utilization. The socio-demographic

factors examined included marital status, parity, religion, and age.

The results revealed that expectant women without spouses were 0.27 times less likely to use the required minimum of FANC visits in comparison to their counterparts who were married. Expectant women without spouses (i.e., single, divorced, and separated) tended to be sole providers of their families and hence were more likely engaged in income-generating activities such as self-employment and thus may not have time to attend adequately to FANC services. The results agree with Nima *et al.* [15], who noted that married women tended to attend FANC services earlier than their divorced or widowed counterparts. Additionally, expectant women who had a parity of at least 2 were 0.16 less likely to use the required minimum of FANC visits in comparison to those with a parity of 1. The finding means that expectant women who had greater parity felt that they were more informed on pregnancy progression and, hence, attended fewer than 8 FANC visits. The findings agree with Gitonga's [14] study in Kenya, which indicated that women who had more pregnancies before did not utilise FANC services; a similar study done in Indonesia indicated that first-time pregnant women attended four ANC visits than those who had pregnancies before [16]. A contradicting study done in Tanzania indicates that FANC utilization tends to be lower among first-time expectant young women [17].

Additionally, expectant women who are Muslim faith followers were 0.11 less likely to use the required minimum of 8 FANC visits in comparison to their Christian counterparts. The findings can be linked to the cultural limitation of Muslim pregnant women, in which case they prefer to go to a health facility managed or with staff that profess the Muslim faith. Moreover, expectant women professing the Muslim faith often do not allow male service providers to offer them FANC services, resulting in low utilization of FANC services. The results are in line with Chorongu *et al.* [10], who noted that Muslims prefer to go to

facilities that are established by the Muslim religion. Further, the age of the expectant mother did not predict their FANC utilization rate. This was contrary to other studies that established that the age of the pregnant woman strongly predicted their utilization of various FANC services. For instance, Gitonga [14] indicated that 63% of pregnant women aged 30 to 34 exhibited a higher rate of utilization of FANC services. The weak effect of age on utilization of FANC services was due to other socio-demographic factors, such as parity, marital status, and religion, which better explained the variations in FANC utilization. Therefore, younger and older women may have similar health-seeking behaviours if controlling factors like parity, marital status, and religion are constant. In the multivariate binary logistic model adopted, age effects were masked by more directly influential predictors.

Limitations: the enquiry was undertaken in a health facility, Lunga Lunga Health Centre, in an informal setting. Thus, the findings may not be generalizable to other settings that are not informal. Further, collecting data from pregnant women was challenging due to privacy concerns and the potential for recall bias. Self-reported data often leads to inaccuracies and memory biases. Participants may also provide socially desirable responses, affecting the validity of the data. In minimizing the recall bias and tendency for respondents to provide desirable responses, the researcher used a survey questionnaire to source only socio-demographic information (marital status, age, parity, and religion) that does not need recall, while data that needed recall (FANC utilization rate) were sourced from maternity attendance records at the hospital. Further, the researcher assured the respondents that data would be treated with utmost confidentiality to ensure honest responses. Additionally, the study was based on socio-demographic predictors of FANC utilization. Therefore, the coefficients should be applied with causation as their magnitude and signs are bound to change if additional predictors are added to the multivariate binary logistic regression model.

Conclusion

The study concluded that the FANC utilization was not adequate, pointing towards an urgent need to provide support to expectant women to enhance their FANC services utilization. The low FANC services utilization was significantly associated with multiparity, Muslim faith followers, and not having a spouse. Consequently, the health care provider should undertake sensitization programs targeting expectant women with multiple parity, without spouses, and those professing the Muslim faith on the need for adequate FANC utilization. Further research should consider other predictors of FANC utilization and target more health facilities to improve the generalization of the findings.

What is known about this topic

- *There is low FANC utilisation in Sub-Saharan Africa;*
- *Most expectant women had their first FANC visit later in the gestation period;*
- *Major socio-demographic factors affecting FANC utilisation include age and religion.*

What this study adds

- *The study has reported a low utilisation of FANC services in an informal settlement in an urban setting;*
- *Marital status, parity, and religion of expectant women significantly predicted FANC utilisation.*

Competing interests

The authors declare no competing interests.

Authors' contributions

Phylister Hellen Nanzala, Micah Matiangi, and Lucy Natecho Namusonge have been equally involved in the study from conception, design, acquisition of data, analysis and interpretation of data, and drafting the article. All the authors read and approved final version of this manuscript.

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Tables and figure

Table 1: cross tabulation of socio-demographic factors against focused antenatal care (FANC) utilisation among pregnant women recruited from Lunga Lunga health facility, Nairobi County (Kenya), from December 2024 - January 2025 (N=272)

Table 2: multivariate binary logistic regression of socio-demographic factors predicting focused antenatal care (FANC) utilisation among pregnant women recruited from Lunga Lunga health facility, Nairobi County (Kenya), from December 2024 to January 2025 (N=272)

Figure 1: first focused antenatal care (FANC) visits by pregnant women to Lunga Lunga health facility, Nairobi County (Kenya) from December 2024 - January 2025 (N=272)

Annex

Annex 1: operationalisation of study variables showing study objectives, variable names, variable descriptions, and measurement scale adopted (PDF - 116KB)

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Table 1: cross tabulation of socio-demographic factors against focused antenatal care (FANC) utilisation among pregnant women recruited from Lunga Lunga health facility, Nairobi County (Kenya), from December 2024 - January 2025 (N=272)

	Category	FANC Utilization		Total
		< 8 times	≤ 8 times	
Age	15-18	15 (6.1%)	4(14.8%)	19(7.0%)
	19-22	70(28.6%)	8(29.6%)	78(28.7%)
	23-25	62(25.3%)	6(22.2%)	68(25.0%)
	25 and above	98(40.0%)	9(33.3%)	107(39.3%)
Marital status	Single/never married	34(13.9%)	6(22.2%)	40(14.7%)
	Married/cohabiting	192(78.4%)	19(70.4%)	211(77.6%)
	Separated/divorced	19(7.8%)	2(7.4%)	21(7.7%)
Religion	Muslims	10(4.1%)	1 (0.0)	10 (3.7%)
	Christians	235(95.9%)	27(100.0)	262(96.3%)
Parity	1	72(29.4%)	12(44.4%)	84(30.9%)
	2	98(40.0%)	11(40.7%)	109(40.1%)
	3	53(21.6%)	1(3.7%)	54(19.9%)
	4	16(6.5%)	3(11.1%)	19(7.0%)
	5 and above	6(2.4%)	0(0.0%)	6(2.2%)

Table 2: multivariate binary logistic regression of socio-demographic factors predicting focused antenatal care (FANC) utilisation among pregnant women recruited from Lunga Lunga health facility, Nairobi County (Kenya), from December 2024 to January 2025 (N=272)

Factors	Category	P-value	AOR	95% CI	
				Lower	Upper
Marital status	Married			REF	
	Single/separated/ divorced	0.001	0.275	0.126	0.600
Age	15-22			REF	
	22<	0.119	0.509	0.218	1.190
Parity	1			REF	
	1 <	0.000	0.163	0.072	0.372
Religion	Christian			REF	
	Muslim	0.037	0.111	0.014	0.877

AOR: adjusted odds ratio, CI: confidence interval

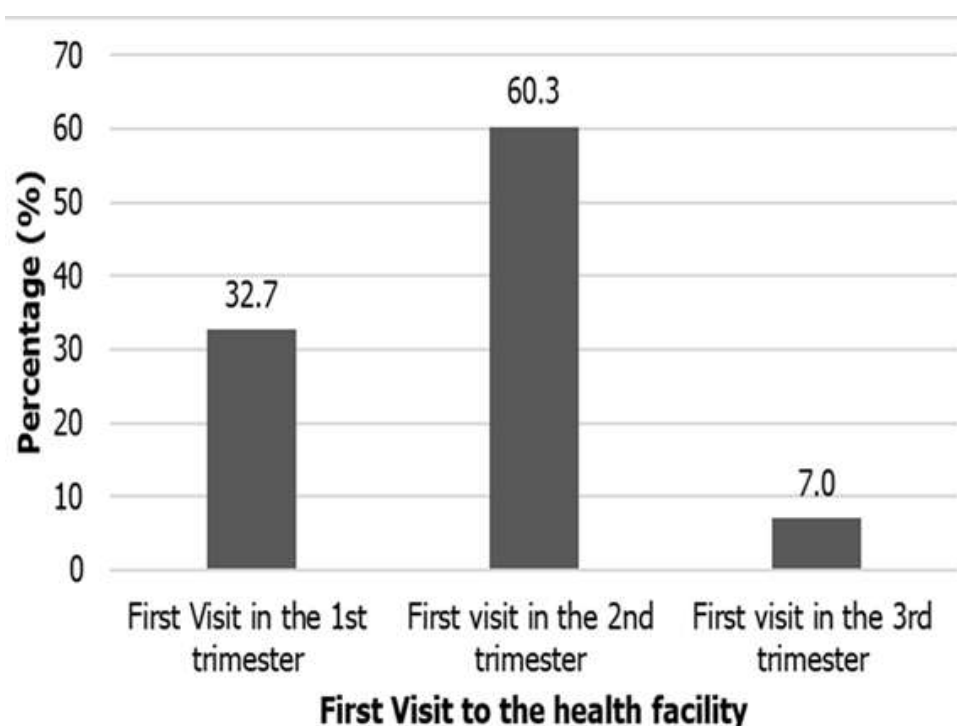


Figure 1: first focused antenatal care (FANC) visits by pregnant women to Lunga Lunga health facility, Nairobi County (Kenya) from December 2024 - January 2025 (N=272)