

Prevalence and factors associated with antenatal care services utilisation among urban refugees in Kampala, Uganda

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Abstract

Introduction: Regular antenatal care (ANC) is critical for positive maternal health outcomes. Despite the global emphasis on ANC utilization, sub-Saharan Africa, particularly Uganda, faces challenges with low timely ANC coverage. We investigated the prevalence and factors associated with ANC utilization among urban refugees in Kampala, Uganda.

Methods: We employed a cross-sectional convergent parallel mixed-methods technique to collect data among urban refugee women aged 15-49 years in Kampala, Uganda. Data were collected from 153 survey participants using structured questionnaires. We also conducted ten key informant interviews using key informant interview guides. Quantitative data were analysed using descriptive statistics and modified Poisson regression to identify the factors associated with maximised ANC utilization. Qualitative data were analysed thematically.

Results: The prevalence of ANC utilization (≥ 4 visits) among urban refugees was 73.2%. Factors independently associated with this level of utilization included having transport ease (aPR = 0.77; 95%CI: 0.61 – 0.99), having at least a primary education (aPR = 1.95; 95% CI: 1.33 – 2.87), being employed (aPR = 1.40; 95% CI: 1.21 – 1.62), receiving social support (aPR = 1.31; 95% CI: 1.11 – 1.56), and recognizing or being aware of pregnancy danger signs (aPR = 1.90; 95% CI: 1.41 – 2.47). The qualitative data elucidated a complex interplay of barriers impeding ANC access. Insufficient social support networks, inadequate antenatal knowledge linked to lower educational attainment, and insufficient transportation due to economic hardships arising from unemployment collectively constitute significant challenges for urban refugee women seeking antenatal care.

Conclusions: This study emphasises the multifaceted importance of transportation, education, employment, social support, and awareness of pregnancy danger signs in promoting maximised ANC utilization among urban refugee women in Kampala. Achieving maximised ANC uptake requires a comprehensive, integrated approach. Such an approach should include targeted transport barrier mitigation interventions, health education initiatives, strengthening community-based social support structures, and creating sustainable economic opportunities. Addressing these interconnected factors is essential to improving maternal health outcomes within this vulnerable population and advancing progress toward global maternal health goals.

Keywords: Antenatal Care, ANC utilization, urban refugees, maternal health, Kampala, Uganda

Citation

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Introduction

Regular antenatal care (ANC) utilization is a foundation for positive maternal health outcomes. Attending at least four ANC visits (ANC 4+)—referred to as maximized ANC utilization in this study—allows healthcare professionals to monitor the mother's health and the developing fetus comprehensively. Comprehensive monitoring also enables early detection and management of potential complications during pregnancy, significantly improving the chances of a healthy delivery [1]. Therefore, ensuring increased ANC utilisation should be a global focus for maternal health initiatives. Maximised utilisation of ANC is also critical in contributing to the achievement of Sustainable Development Goal Target 3.1, which aims to reduce the global maternal mortality ratio (MMR) to less than 70 per 100,000 live births by 2030 [2].

In 2016, the World Health Organization updated its guidelines to recommend a minimum of 8 ANC contacts during pregnancy, an increase from the previous recommendation of 4 visits [1]. This revision was driven by evidence indicating that more ANC contacts are linked to lower perinatal mortality and greater maternal satisfaction [3]. However, many low- and middle-income countries (LMICs), particularly in sub-Saharan Africa, continue to face significant challenges in meeting the previous standard of 4 ANC visits. A case in point, while global estimates suggest 62% of pregnancies benefit from this level of care, sub-Saharan Africa lags at 52%. Within the sub-Saharan region, discrepancies are evident, with Uganda reporting only 60% ANC4+ coverage, despite its 2018 adoption of the WHO ANC 8+ visits. While this achievement surpasses the 45% target set in Uganda's Health Sector Development Plan 2015/16 – 2019/20, it still falls short of the ideal universal coverage [4-7]; hence, there is a need to interrogate ANC 4+ coverage in this study. The low coverage of ANC 4+ in LMICs like Uganda arises from several barriers, including transportation issues, financial constraints, cultural beliefs, and insufficient healthcare services [8].

Barriers to ANC utilization are exacerbated among vulnerable populations in LMICs, including refugee communities. The compounded challenges of forced displacement, the psychological and social stressors associated with adapting to new environments, and the complexities of navigating unfamiliar healthcare systems often exacerbate pre-existing obstacles to accessing health care services [9]. Uganda, host to the largest refugee population in Africa and third-largest globally (over 1.7 million refugees and asylum seekers), faces significant challenges in providing adequate healthcare to its urban refugee population. Within this context, Kampala, the capital city, is home to an estimated 148,898 urban refugees, who are expected to be economically self-sufficient [10-12]. Urban refugees face several barriers to healthcare access, including difficulty in accessing

health facilities, language barriers, discrimination, and cultural differences [13]. Notably, while the prevalence of ANC 4+ among refugees living in settlements across Uganda is high at 84% [14], there is a dearth of data regarding urban refugees living in Kampala.

To expansively address the complexities of ANC utilization among this population, we conducted a cross-sectional convergent parallel mixed-methods design study to determine the prevalence of ANC service utilisation and assess the factors associated with it among urban refugees in Kampala, Uganda, to develop targeted recommendations and interventions to enhance the utilisation of ANC services within this population, guided by the identified significant factors.

Methods

Study design and area

This study employed a cross-sectional convergent parallel mixed-methods design, conducted from June 2023 to August 2023. The study was conducted in Kampala, Uganda's largest city, which harbours a diverse refugee population estimated at 148,898 [12]. Urban refugees primarily reside in the low-income areas of Central, Makindye, and Rubaga Divisions [15]. Kampala, besides being a capital city, was chosen as the study location due to the unique challenges faced by its sizable urban refugee population compared to other cities in Uganda [16]. The qualitative component of the study was designed to provide a deeper understanding of the factors influencing ANC utilization identified through the quantitative survey. Specifically, the qualitative data served to contextualize and explain the statistical associations observed.

Study population

The study recruited urban refugee women of reproductive age (15-49 years) in Kampala, Uganda, specifically focusing on mothers who had given birth within six months before the survey and had lived in Kampala for over a year. In addition to these women, key informants who play a crucial role in advocating for and supporting them in accessing healthcare were also included. These key informants comprised midwives, Non-Governmental Organisation public health managers, urban refugee leaders, and refugee hospital aides. Mothers who were unreachable or unwilling to provide consent, as well as key informants who did not consent, were excluded from the study.

Sample size determination

The sample size for this study was determined to be 153, accounting for an anticipated 10% non-response rate. This calculation was performed using the Kish Leslie formula [17]. This is suitable for the study's quantitative survey design involving the random selection of participants from

Table 1. Illustration of sampling proportionate to size

Health Facility	Eligible Study Participants	Proportionate to Size	Sample Size
Kisenyi Health Center IV	203	$(203/384) \times 153$	81
Praise God Medical Center	97	$(97/384) \times 153$	39
Emmanuel Medical Center	84	$(84/384) \times 153$	33
Total	384	$(384/384) \times 153$	153

a well-defined population of urban refugee women in Kampala. The formula incorporated a standard normal deviate of 1.96 at a 95% confidence interval, a known prevalence of 77.3% of women attending at least four ANC visits among refugees in Uganda's West Nile region [18], and a 7% margin of error.

A 7% margin of error was chosen to pragmatically balance statistical precision with practical feasibility, taking into account the specific context and constraints of the study population. This decision aligns with established research practices, as most studies typically permit a margin of error ranging from 5% to 10% at a 95% confidence level [19]. A smaller margin of error (e.g., 5%) would have required a substantially larger sample size, potentially exceeding the available pool of eligible participants within the three selected health facilities and increasing the logistical and financial demands of the study. Given the exploratory nature of this research on urban refugees in Kampala and the limited prior data available, a 7% margin of error was deemed acceptable to provide reasonably accurate estimates while maintaining a feasible sample size.

Sampling procedure

Survey participants were recruited using simple random sampling from the patient registries of three designated health facilities: Kisenyi Health Center IV, Praise God Medical Center, and Emmanuel Medical Center. To ensure adequate representation from each facility, we allocated the number of study participants proportionally to the eligible population size at each site (Table 1). The process for determining the number of eligible participants at each facility was as follows:

- Before initiating participant recruitment, we collaborated with record officers at each of the three health facilities to assess the potential pool of eligible participants at each respective facility. Eligible participants were defined as urban refugee women aged 15-49 years who had given birth within six months before the survey, had lived in Kampala for over a year, and had sought ANC services at the respective facilities.
- Over a period of nine days leading up to the recruitment phase, we worked with trained research assistants to systematically screen the ANC and postnatal care registers at each facility. During the

data extraction process, the records of the eligible participants were identified.

- Each potential participant identified from the registers was carefully screened against our inclusion criteria. This involved verifying their refugee status (through documentation or self-report), confirming their age and residency in Kampala, and ensuring that their delivery occurred within the six-month recall period.

After reviewing records at each facility, we determined the eligible population sizes to be as follows:

- Kisenyi Health Center IV: 203
- Praise God Medical Center: 97
- Emmanuel Medical Center: 84

Based on these numbers, we calculated the proportion of eligible participants at each facility relative to the total number of eligible participants across all three facilities. For example, Kisenyi Health Center IV had 203 eligible participants out of a total of 384 across all facilities; its proportion would be 81 (52.9%). This was derived by dividing the eligible participants at the facility (203) by the total of all eligible participants across all the facilities (384), then multiplying by the sample size calculated for the study (153). This was done for each facility to determine its proportion to the overall sample size.

Once the sample size was determined for each facility, we used simple random sampling to select participants from the list of eligible women in the patient registries. This ensured that every eligible woman within each facility had an equal chance of being included in the study.

The selection of these three health facilities was based on several key considerations. First, they are strategically located within the Kampala divisions (Central, Makindye, and Rubaga) where a significant proportion of the urban refugee population resides [15]. Second, facility records and consultations with urban refugee healthcare providers corroborated that these sites routinely serve a significant volume of refugee women seeking antenatal care, and that dedicated refugee-specific patient registries are maintained. Third, they represent a mix of public and private healthcare providers, potentially capturing a more diverse sample of urban refugees with varying socioeconomic backgrounds and healthcare preferences.

While utilizing health facility registries offered a practical approach to recruit participants, we acknowledge the potential biases that may affect the representativeness of the sample. One such potential bias is that the sample may over-represent refugees who actively seek and utilize formal healthcare services. Refugees who face significant barriers to accessing these facilities (e.g., those with severe mobility issues, undocumented status, or a strong preference for traditional healers) may be underrepresented. We acknowledge the potential for selection bias and have taken steps to mitigate its impact and to interpret the findings with caution, considering the specific characteristics of the sampled population. The findings may be most generalizable to urban refugees in Kampala who are engaged with formal healthcare services.

Additionally, ten key informants were purposively selected based on their expertise and active involvement in facilitating healthcare access for urban refugees. These included two midwives who represented the health professionals, one Public Health Manager as the Non-Governmental Organizations representative, four urban refugee community leaders, and three refugee hospital aides.

Study variables and instruments

The outcome variable of the study was maximised ANC utilization (≥ 4 visits). This metric was based on the WHO health services coverage indicator—Antenatal care coverage: at least four visits (%). The rationale behind this indicator is that attending four or more antenatal visits increases the likelihood of effective maternal interventions and leads to better maternal outcomes [1]. Maximised ANC utilization, the outcome variable of interest captured during the survey, was dichotomised: less than four ANC visits and four or more visits.

The study adapted Andersen's Behavioural Model of Health Services Utilisation as a conceptual framework for selecting the exposure variables. Andersen's model posits that healthcare utilization is influenced by three categories of factors: predisposing characteristics, enabling resources, and need [20]. The 15 exposure variables used in the modified Poisson regression analysis in the study, along with their operationalization within Andersen's model, are detailed below:

Predisposing factors: These factors represent an individual's inclination to use healthcare services before the onset of any specific need. In this study, predisposing factors were operationalised as:

- **Age** (<19 years, 20- 34 years, and 35+ years)—Reflects the tendency for different age groups to perceive and prioritize healthcare needs differently. This age classification is based on a previous maternal health study [21].

- **Educational level** (none, primary, secondary, and tertiary)—Education is assumed to influence health literacy and awareness of the benefits of ANC.
- **Religion** (Catholic, Anglican, Muslim, and Pentecostal)—Religious beliefs and practices can influence health-seeking behaviors and attitudes toward modern medicine, including ANC.
- **Country of Origin** (Democratic Republic of Congo, Rwanda, Burundi, Somalia, and South Sudan)—Reflects potential cultural differences in healthcare-seeking behaviours and experiences with healthcare systems in their home countries.
- **Cultural beliefs and practices** (held cultural beliefs that hindered ANC utilization or not)—Assesses whether traditional beliefs or practices discourage or prevent women from seeking ANC services.
- **Knowledge of ANC** (excellent, good, fair, and poor)—Measures the level of understanding about the purpose and benefits of antenatal care.
- **Attitude towards ANC Services** (very important, important, neutral, and not important)—Captures the individual's perception of the value and importance of ANC, influencing their motivation to seek care.

Enabling Factors: These factors represent the resources and conditions that facilitate or impede access to healthcare services. In this study, enabling factors were operationalized as:

- **Household income** (<100,000, 100,000 – 300,000, and >300,000 Ugandan Shillings)—Income directly impacts the ability to afford transportation, consultation fees, and other costs associated with ANC.
- **Employment status** (employed or not)—Employment can provide financial resources and social support, enabling women to access ANC services.
- **Knowledge of where the health facility is located** (knew the location of the health facility or not)—Knowing the location of a health facility is a prerequisite for accessing care.
- **Distance to the health facility** (<3 kilometers and ≥ 3 kilometres)—Distance acts as a barrier to access, with longer distances potentially discouraging ANC attendance.
- **Transportation challenges** (experienced them or not)—Difficulties in transportation (cost, availability) can hinder access to ANC services.
- **Common language proficiency** (knows Luganda or English and doesn't know)—The ability to communicate with healthcare providers in a common language (Luganda or English) facilitates effective interaction and encourages service utilization.

- **Social support** (received and didn't receive)—Social support networks can provide encouragement, information, and practical assistance, promoting ANC utilization.

Need factors: These factors represent the perceived or evaluated need for healthcare services. In this study, the need factor was operationalized as:

- **Pregnancy danger signs** (experienced them or not)—Experiencing danger signs during pregnancy increases the perceived need for medical attention and encourages ANC utilization.

We used structured questionnaires with closed-ended questions to collect quantitative data and key informant interview guides with open-ended questions to gather qualitative data. These tools were employed to assess and explore the influence of the exposure variables on the outcome variable, respectively.

Data management and analysis

The data collected were imported into Microsoft Excel, cleaned and then exported to the analysis software, STATA version 15.0. The analysis was done at univariate level for the descriptive statistics in the form of frequencies, means, percentages, and standard deviations. The relationship between the dependent variable and the independent variables was determined using a modified Poisson regression model; bivariate analysis was stated in unadjusted prevalence ratios at the 95% confidence level. The cut-off values for the variables to be included in the multivariable model were set at $P < 0.20$. Potential factors were checked for multicollinearity where a variable was selected whenever a pair-wise correlation coefficient of less than 0.4 was observed and was included in the final multivariable modified Poisson regression model.

The backwards elimination technique was adopted for the study. The variables were tested for their importance using Wald's test, and those that had P-values less than 0.2 were maintained in the model. The findings of the multivariable modified Poisson regression were provided in the form of adjusted prevalence ratios (aPRs) with 95% confidence intervals. Interaction terms were checked for in the final regression model to reveal more distinct relationships between the different variables using stratified analysis. We recognize the value of sensitivity analysis but did not conduct it here. The primary model was rigorously specified using theory and literature, with diagnostics showing no significant issues (e.g., influential observations or overdispersion). Minimal missing data (< 5%) supported the use of complete-case analysis. Robust standard errors ensured reliable estimates. While sensitivity analysis can offer additional insights, the primary analysis provides robust and interpretable results.

All ten Key Informant Interviews (KII) were audio-recorded and transcribed verbatim. To ensure

accuracy and quality control, the Principal Investigator (PI) cross-referenced each transcription with its corresponding audio recording. The ten transcripts were then subjected to a rigorous, iterative review process. Each transcript was read a minimum of four times: initially to gain a broad understanding of emerging patterns, and subsequently to refine and deepen the analysis. Following this, the transcripts were imported into ATLAS.ti 9 for systematic qualitative data management and analysis.

Initial coding was conducted using three randomly selected KII transcripts to identify and develop a preliminary set of codes that captured the most noticeable concepts. These initial codes were then applied to the remaining transcripts. Where the initial codes proved insufficient, additional codes were inductively derived to ensure comprehensive coverage of the data. Through this iterative process, a robust coding framework was established, which facilitated the identification of overarching themes and subthemes. These themes were carefully aligned with the study's conceptual framework, ensuring theoretical coherence and relevance.

To enhance the validity of the findings, the PI employed a multi-step validation process. First, the PI conducted a thorough and iterative review of the emerging themes to verify their consistency with the data. This involved repeated engagement with the transcripts, during which the PI documented emerging patterns and took detailed analytical notes. Second, to ensure inter-coder reliability, a second independent coder with expertise in qualitative methods was engaged. Both coders independently applied the coding framework to a subset of transcripts ($n=3$) and compared their results. Discrepancies were resolved through discussion and consensus, and the refined coding framework was then applied to the remaining transcripts. This process ensured consistency and reduced bias in the interpretation of the data.

To further validate the themes, the PI systematically identified and extracted illustrative quotes from the transcripts that substantiated each theme. These quotes were reviewed to ensure they accurately reflected the underlying data. Additionally, the PI conducted a comprehensive review of the evidence supporting each theme, ensuring that the analysis was both rigorous and reflective of the data. This meticulous process culminated in a finalized thematic framework that accurately represented the key insights derived from the KIIs.

Ethical considerations

Ethical approval was obtained from the Makerere University School of Public Health Higher Degrees Research and Ethics Committee (Protocol No.218). Permissions were also secured from the Office of the Prime Minister and the Directorate of Public Health Services and Environment at the Kampala Capital City Authority. All participants were provided with written informed consent

after receiving a detailed explanation of the study's purpose, procedures, potential risks and benefits, and their right to withdraw at any time in secluded private rooms that catered for confidentiality. Consent forms were translated into languages commonly spoken by the refugee population (English, French, Swahili, Somali, and Kinyarwanda), and bilingual research assistants were available to assist participants. For participants with limited literacy, research assistants read the forms aloud and assessed comprehension; thumbprints were accepted as consent with witness attestation. Data were anonymized, and stored securely on the Principal Investigator's password-protected laptop. Individuals unwilling to provide consent were excluded from the study to uphold ethical principles and respect autonomy.

Results

Respondents sociodemographic characteristics

The survey participants had a mean age of 27.8 years (SD \pm 5.7), and a majority (69.9%) were aged 25 years and older. Additionally, 49.7% had attained secondary or tertiary education, and 45.1% were of Congolese origin (Table 2). Key informants, including ten individuals (five women) recruited from diverse origins, including South Sudan, the DRC, Somalia, Burundi, Uganda, and Rwanda, had professional experience with ANC services among urban refugees ranging from four to eight years, with an average of 5.4 years. These informants comprised refugee hospital aides, midwives, community leaders, and NGO staff.

Table 2. Background Characteristics of Survey Respondents (n = 153)

Background Characteristics	Frequency	Percent (%)
Age (Mean = 27.8, SD \pm 5.7)		
≤ 19 years	10	6.6
20–34 years	120	78.4
35+ years	23	15.0
Highest education level		
No education	37	24.2
Primary	40	26.1
Secondary+	76	49.7
Religion		
Catholic	47	30.7
Anglican	39	25.5
Muslim	18	11.8
Pentecostal	49	32.0
Country of origin		
Congo	69	45.1
Rwanda	29	19.0
Burundi	39	25.5
Somalia	10	6.5
South Sudan	6	3.9
ANC services utilization		
Limited (< 4 ANC visits)	41	26.8
Maximized (\geq 4 ANC visits)	112	73.2

Prevalence and factors associated with antenatal Care Services utilisation among urban refugees in Kampala, Uganda

Our study revealed that the prevalence of maximised ANC utilization was 73.2% (Table 2). Furthermore, we identified several independent factors significantly associated with improved ANC utilization, including transportation, education, employment, social support, and the ability to recognize pregnancy danger signs (Table 3).

Mothers who experienced transportation challenges demonstrated lower utilization of ANC services compared to those who did not face such challenges. The prevalence of maximised ANC utilization among mothers with transportation difficulties was 0.77 times that of mothers without such challenges (aPR = 0.77; 95% CI: 0.61–0.99). This finding was further supported by qualitative insights from key informants KII002 and KII008, who stated:

“Transportation poses a significant challenge, particularly for pregnant women who need to access healthcare facilities and do not have the money to pay for transport. Due to the lack of money to afford transport, some women are even forced to give birth at home, even when they are unwell or require medical attention.” (KII002)

“These pregnant women primarily rely on boda-bodas (motorbikes) for transportation, often having to share a ride with a relative or neighbour due to the high cost of hiring a bike for each person. Although this practice violates police regulations, they resort to it out of necessity, as the expense of more than one bike is prohibitively high.” (KII008)

These accounts complement the quantitative findings that transportation challenges significantly hinder access to ANC. Additionally, when ten key informants (KIs) were asked whether transportation posed a barrier to ANC access, nine of them confirmed that it does.

Mothers with at least a primary level of education demonstrated better utilization of ANC services in comparison to those with no formal education. The prevalence of maximized ANC services utilization among mothers with a primary level of education was 1.95 times that of mothers with no formal education (aPR = 1.95; 95% CI: 1.33 – 2.87). Furthermore, the prevalence of maximized ANC services utilization among mothers with secondary or tertiary level of education was 2.01 times that of mothers with no formal education (aPR = 2.01; 95% CI: 1.40 – 2.90). This finding was supported by the qualitative insights provided by key informants KII001 and KII007 who said:

“Education significantly influences antenatal care services utilization. Educated individuals possess knowledge that motivates them to seek antenatal care

Table 3. Factors Associated with Antenatal Care Services Utilization Among Urban Refugees in Kampala, Uganda

Factors	ANC services utilization		Unadjusted PR	Adjusted PR
	Maximized n (%)	Limited n (%)		
Transport				
No challenges	90 (84.91)	16 (15.09)	1.00	1.00
Faced challenges	22 (46.81)	25 (53.19)	0.55 (0.40–0.76)	0.77 (0.61–0.99)*
Highest education level				
No formal education	13 (35.1)	24 (64.9)	1.00	1.00
Primary	31 (77.5)	9 (22.5)	2.21 (1.38–3.53)**	1.95 (1.33–2.87)**
Secondary+	68 (89.5)	8 (10.5)	2.54 (1.63–3.98)***	2.01 (1.40–2.90)***
Employment status				
Not employed	47 (54.7)	39 (45.4)	1.00	1.00
Employed	65 (97.0)	2 (3.0)	1.78 (1.46–2.16)***	1.40 (1.21–1.62)***
Received social support				
No	38 (53.5)	33 (46.5)	1.00	1.00
Yes	74 (90.2)	8 (9.8)	1.69 (1.34–2.12)***	1.31 (1.11–1.56)*
Experienced pregnancy danger signs				
No	15 (40.5)	22 (59.5)	1.00	1.00
Yes	97 (83.6)	19 (16.4)	2.10 (1.40–3.10)***	1.90 (1.41–2.47)***

PR: Prevalence Ratio. Significance levels: $P < 0.001 = ***$, $P < 0.01 = **$, $P < 0.05 = *$.

services, unlike those without formal education.” (KII001)

“Most women in this community do not attend school, lack knowledge about Antenatal Care, and are unaware of when to seek it.” (KII007)

These statements highlight the critical role of education in providing knowledge and motivation, which directly correlates with the observed increase in ANC utilization among educated individuals. Moreover, all ten KIs involved in the study unanimously agreed that education positively influences access to ANC when questioned on the matter.

Mothers who were employed had better utilization of ANC services compared to those who were not employed. The prevalence of maximized ANC services utilization among employed mothers was 1.4 times that of unemployed mothers (aPR = 1.40; 95% CI: 1.21 – 1.62). This finding was corroborated by insights from key informants KII010 and KII008 who remarked:

“They lack the financial means to afford treatment, particularly because many of them are unemployed.” (KII010)

“Most of them do not earn a steady income or engage in formal employment. If they do work, it is often in low-paying, informal jobs that provide just enough to get by—barely covering basic needs and occasional hospital bills.” (KII008)

The qualitative data provide valuable insights into the mechanisms underlying the quantitative finding that

employment is associated with increased ANC utilization. Specifically, the qualitative interviews revealed that employment provides women with the financial resources necessary to access ANC services. This interpretation is further supported by the consistent affirmation from nine out of ten KIs who emphasized the facilitative role of employment in enabling pregnant women to access ANC.

Mothers who had social support had better utilization of ANC services as compared to those who did not. Keeping all factors constant, the prevalence of maximized antenatal care services utilization among mothers who had social support was 1.31 times that of mothers without social support (aPR = 1.31; 95% CI: 1.11 – 1.56). This observation was reinforced by remarks from key informants KII001 and KII003:

“In certain cultures, like among the Somalis, women often refrain from accessing health facilities unless accompanied by a support person” (KII001)

“Many of these women are single mothers with young children. They often feel unable to leave their homes due to childcare responsibilities or financial constraints, as they cannot afford to start small businesses or leave their households unattended. Additionally, they perceive their living environments as insecure, which further discourages them from accessing health services out of fear of leaving their homes unprotected.” (KII003)

The qualitative findings provide valuable context for understanding the role of social support in ANC utilization, complementing the quantitative results. Seven out of ten key informants corroborated this association, consistently

emphasizing the positive impact of social support on access to antenatal care services.

Mothers who were aware of pregnancy danger signs exhibited improved utilization of ANC services compared to those who were not. The prevalence of maximized antenatal care services utilization among mothers who recognized pregnancy danger signs was 1.9 times that of those who did not recognize these signs (aPR = 1.90; 95% CI: 1.41 – 2.47). This observation was confirmed by remarks from key informants KII009 and KII010, who said:

“Certain women do not prioritize maternal health care; they only seek medical attention when experiencing severe symptoms like bleeding or intense pain” (KII009)

“Most of the women don’t know the use of maternal health care, so they don’t come to begin treatment early. They come only when sick.” (KII010)

These quotes emphasize the heightened sense of urgency that accompanies the recognition of pregnancy danger signs, thereby promoting increased ANC utilization. This finding is unanimously supported by the key informants (10/10), who consistently affirmed the facilitative effect of danger sign awareness on accessing antenatal care services.

A stratified analysis based on the experience of pregnancy danger signs revealed that the interaction was more pronounced for education and less significant for employment. This suggests that the experience of pregnancy danger signs modifies the association between access to ANC and education, as well as the association between access to ANC and employment.

Discussion

This study examined the prevalence and factors associated with ANC utilization among urban refugee women in Kampala, Uganda, employing a mixed-methods approach to provide a comprehensive understanding of this complex issue. Our findings reveal both encouraging levels of ANC access and persistent challenges that warrant targeted interventions.

The observed prevalence of maximised ANC utilization (73.2%) among urban refugees in Kampala presents a mixed picture. While this figure surpasses the national average for Uganda (60%) [5], it is notably lower than the 84% reported among refugees living in settlements in the West Nile region [14]. This discrepancy likely reflects the unique challenges faced by urban refugees, who are expected to be self-reliant and navigate a complex urban environment without the structured support systems and targeted assistance often provided in refugee settlement settings. Unlike their counterparts in settlements who

typically receive food aid, shelter, and facilitated access to healthcare, urban refugees must compete for scarce resources, navigate bureaucratic hurdles, and often face discrimination in accessing essential services [10]. This highlights the limitations of generalising findings from refugee settlements to urban contexts and highlights the need for personalised interventions that address the specific vulnerabilities of urban refugees.

Our study confirms a significant association between ease of transport and maximized ANC utilization among urban refugee women in Kampala. The findings align with existing literature from LMICs indicating that transportation costs and accessibility are major impediments to accessing health services, particularly for vulnerable populations [22]. This suggests that transportation remains a critical barrier to accessing ANC, even in urban settings. Unlike refugee women in settlements, where transportation is often provided [23], Urban refugee women must navigate complex and costly transportation systems independently. This lack of structured support exacerbates their vulnerability, limiting their ability to access timely and adequate ANC services.

Transport difficulties among the urban refugees can manifest in multiple ways, including high costs, lack of reliable transportation options, and safety concerns during travel. Hence, interventions to mitigate transportation barriers could include providing subsidized transport vouchers, establishing community-based transportation systems, or locating ANC services closer to refugee communities. This might also include the use of mobile health (mHealth) technologies and telemedicine to reduce the need for frequent physical visits to health facilities, with emphasis on ensuring that women still make the recommended visits to health facilities.

Our study further confirms the well-established association between education and ANC utilization [24]. However, qualitative data revealed that even among those with some education, certain barriers still impede uptake. This suggests that simply increasing educational attainment may not be sufficient to improve ANC uptake. Interventions should focus on delivering targeted health education messages that are culturally appropriate, linguistically accessible, and tailored to the specific needs and literacy levels of urban refugee women. Furthermore, leveraging existing community-based networks, such as refugee-led organizations and religious institutions, could enhance the reach and effectiveness of these educational efforts [25]. This is particularly important given the potential distrust of formal healthcare systems among some refugee communities due to past experiences in their home countries or experiences of discrimination in refugee host countries [26].

Employment also emerged as a significant factor influencing ANC utilization, aligning with previous

research on vulnerable populations [27]. However, it is crucial to consider the quality of employment and the precarious economic circumstances faced by many urban refugees. Even those who are employed may be engaged in informal, low-wage jobs that provide limited financial security and lack access to health insurance or other benefits. This suggests that interventions aimed at promoting economic empowerment should focus on creating opportunities for sustainable livelihoods, such as vocational training, micro-enterprise support, and access to financial services [28]. Additionally, addressing systemic barriers to employment, such as discrimination and lack of recognition of foreign qualifications, is essential to creating a more equitable playing field for urban refugees.

The importance of social support for ANC utilization underlines the critical role of community-based interventions in promoting maternal health among urban refugees. However, the structure and function of social networks may differ significantly for urban refugees compared to other populations. Refugees may rely heavily on informal support from other refugees, who may themselves lack adequate knowledge and resources. Moreover, social isolation and fragmentation of communities due to displacement can further erode traditional support systems. Therefore, interventions aimed at strengthening social support should focus on building the capacity of refugee community leaders to provide accurate health information, connecting women with formal healthcare services, and fostering a sense of community and belonging [29].

Furthermore, our finding that awareness of pregnancy danger signs is strongly associated with increased ANC utilization aligns with existing literature highlighting the importance of health literacy in promoting positive maternal health behaviors [30]. However, the context of urban refugees necessitates a deeper examination of this association. While the ability to recognize danger signs undoubtedly empowers women to seek timely care, the accessibility and acceptability of healthcare services may be significantly different for urban refugees compared to other populations. For instance, even with adequate knowledge, undocumented refugees may fear seeking care due to concerns about deportation or discrimination [31]. Furthermore, language barriers, cultural differences, and previous negative experiences with healthcare systems in their countries of origin may further impede their ability to translate knowledge into action [13]. Therefore, interventions aimed at improving awareness of pregnancy danger signs should be coupled with efforts to address these systemic barriers, such as providing culturally competent healthcare services, offering language assistance, and ensuring that all refugee women, regardless of their legal status, have access to affordable and respectful care.

While our study provides valuable insights into ANC

utilization among urban refugees in Kampala based on the strength of the mixed methods it employed, it is important to acknowledge its limitations. The cross-sectional design limits our ability to establish causality. Furthermore, the sample was drawn from women actively engaged with formal healthcare services, which may not be representative of the broader urban refugee population in Kampala. Additionally, the absence of data on parity represents a limitation. Parity can influence women's perceptions of risk during pregnancy, their knowledge of ANC services, and their patterns of healthcare utilization, and not including it potentially limits the scope of our analysis.

To build upon these findings, future research should prioritize longitudinal study designs to evaluate the sustained impact of interventions aimed at enhancing ANC utilization among urban refugee women. Furthermore, employing community-based sampling methodologies is crucial to reach and understand the experiences of women not currently engaged with formal antenatal care services. Such approaches should also investigate the intersectional influences of parity, duration of stay in Uganda, and legal status on ANC access. Finally, further research is warranted to explore the impact of experiencing pregnancy danger signs on other determinants of ANC utilization, and to conduct sensitivity analyses to assess the robustness of findings under varying assumptions.

Conclusions

This study highlights the multifaceted importance of transportation, education, employment, social support, and awareness of pregnancy danger signs in promoting maximized ANC utilization among urban refugee women in Kampala. Achieving optimal ANC uptake requires a comprehensive, integrated approach. Such an approach should include providing transportation challenges interventions, targeted health education initiatives, strengthening community-based social support structures, and creating sustainable economic opportunities.

Addressing these interconnected factors is essential to improving maternal health outcomes within this vulnerable population and advancing progress toward global maternal health goals. However, it is critical to interpret these findings within the specific context of urban refugees in Kampala. While the quantitative data highlights the significance of individual-level factors, the qualitative data reveals the complex interplay of systemic barriers that often transcend individual agency. For example, even employed women may struggle to afford ANC services due to low wages and the high cost of living in Kampala.

Furthermore, the relatively high prevalence of ANC utilization (73.2%) should be considered in light of potential selection bias, as our sample was drawn from

women actively engaged with formal healthcare services. This suggests that the actual prevalence of maximized ANC utilization among the broader urban refugee population in Kampala may be lower. Therefore, interventions should not only focus on individual empowerment but also on addressing the systemic barriers that limit access to care for the most vulnerable and marginalized. Finally, future research should explore the longer-term impact of these interventions on maternal and child health outcomes, as well as examine the effectiveness of different strategies for reaching and engaging women who are not currently utilizing formal healthcare services.

Recommendations

In light of the evidence demonstrating significant associations between transportation, education, employment, social support, and awareness of pregnancy danger signs with maximised ANC utilization among urban refugee populations in Kampala, Uganda, it is recommended to implement integrated, community-based health promotion initiatives. These programs should prioritize the provision of subsidized transport vouchers, establishing community-based transportation systems, or locating ANC services closer to refugee communities. This might also include the use of mHealth technologies and telemedicine, delivery of culturally tailored health education to enhance awareness of ANC benefits and maternal danger signs, while simultaneously addressing structural barriers through vocational training and economic empowerment opportunities.

Additionally, fostering robust social support networks via peer-led support groups could further mitigate barriers to care. To ensure relevance, effectiveness, and sustainability, such interventions should be co-designed and implemented in close collaboration with refugee community leaders, local healthcare providers, and other key stakeholders. This participatory approach will not only enhance program acceptability but also promote long-term engagement and impact within the community.

What is already known about this topic

- It is already known that in sub-Saharan Africa, only 52% of pregnancies receive the recommended ANC 4+ care, with Uganda slightly higher at 60%. Factors contributing to low ANC coverage in low-income countries include transportation issues, financial constraints, cultural beliefs, and inadequate healthcare infrastructure.
- It is also known that urban refugees face additional obstacles to accessing ANC services, such as difficulty locating and accessing health facilities, language barriers, discrimination, and cultural differences.

What This Study Adds

This study presents Kampala-specific data on ANC utilization among urban refugees, revealing a 73.2% prevalence of maximized ANC services utilization (≥ 4 visits), which is lower than the 84% reported in refugee settlements.

- The study further identifies key factors that independently influence ANC utilization among urban refugees such as education, employment, social support, and awareness of pregnancy danger signs with contextual insights from key informant interview excerpts.

Conflict of Interest

The authors of this work declare no competing interests.

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Authors' contributions

IO conceptualized the project, led the data collection and analysis and drafted the initial draft of the manuscript. JB provided invaluable supervision throughout the study and reviewed the manuscript drafts. SB and BK played a pivotal role in the study's foundation, shaping the conceptual framework and laying the groundwork for the initial design. CGO provided oversight throughout the study.

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