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# Factors associated with completion of maternal health services, a cross-sectional study among women at an outpatient facility in Northern Uganda

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## Abstract

**Background** Completion of maternal health care (MHC) services during pregnancy, childbirth, and postnatal care is crucial for reducing maternal and newborn mortality. However, a low proportion of mothers achieve this continuum, especially in rural and peri-urban areas. This study aimed to determine maternal health care service utilization.

**Methods** A facility-based cross-sectional study was conducted over two months at an out-patient facility in Northern Uganda. A structured interviewer-administered questionnaire was used, covering individual, cultural, and family characteristics and the utilization of MHC services. Both bivariable and multivariable logistic regression analyses were performed. Variables with  $p \leq 0.05$  in the bivariable analysis were included in the multivariable analysis to identify factors significantly associated with completion.

**Results** In this study, only 14% of participants had completed MHC services along the care continuum, which included four or more antenatal care visits/contact with skilled health professionals, skilled delivery, and postnatal care. Factors that are significantly associated with the completion of maternal care include; age ( $aOR = 0.24$ , 95% CI: 0.09–0.61,  $p = 0.013$ ), women who were 30 or less years of age nearly 70% higher chance of MHC service completion along the continuum, and participants' nationality ( $aOR = 2.65$ , 95% CI: 1.19–8.85  $p = 0.05$ ) with women from the Democratic Republic of Congo nearly three times likely to complete MHC services along the continuum.

**Conclusions** There is need to continuously sensitize women about the relevance maternal health services along the continuum to improve utilization and completion MHC services along the continuum. Interventions should focus on encouraging early initiation of antenatal care and possibly provide individualized and women centered messages.

**Keywords** Maternal health care services, Continuum of care, Antenatal, Skilled birth attendance, Postnatal care

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## Background

The health of women during pregnancy, childbirth, and the postnatal period is vital to the well-being of families, communities, and nations as it promotes optimal maternal health and supports the development of healthy families [1]. The maternal health care (MHC) continuum extends from conception to postpartum care with quality antenatal care and skilled birth attendance as key components. When women receive quality care throughout these stages, they are more likely to experience positive outcomes, including safe deliveries and recovery, which reduces maternal and infant mortality and morbidity. Promoting maternal health through comprehensive healthcare services at all levels of the continuum fosters the well-being of women and children, particularly in resource-limited and developing countries like Uganda.

The primary goal of completing MHC services across the care continuum is to reduce maternal morbidity and mortality, aligning with the Sustainable Development Goal (SDG) number three [2–4]. This approach assumes that continuous and comprehensive care during pregnancy, childbirth, and the postnatal period improves maternal health outcomes [5]. Health care providers monitor pregnancy, conduct prenatal screening, and provide health education to ensure a healthy pregnancy, while also managing complications during childbirth and postpartum. For successful completion, a woman should attend at least four antenatal visits, have a skilled birth, and receive three postnatal checkups—at 24 h, six days, and six weeks postpartum [6, 7].

Maternal mortality remains a challenge in achieving Sustainable Development Goal number 3, a target of reducing the global maternal mortality ratio to less than 70 maternal deaths per 100,000 live births in Uganda [8]. Maternal health services along the care continuum are essential for reducing maternal mortality by ensuring timely access to critical interventions, such as antenatal care, skilled birth attendance, and postnatal care. These services help detect and manage complications early, promote healthy behaviors, and provide necessary support for both mothers and newborns, ultimately improving survival rates and overall health outcomes. This paper examines the utilization of these services and identifies the factors associated with their completion. Understanding these factors is crucial for improving access, uptake, and retention in care, thereby enhancing maternal and neonatal health outcomes.

Despite progress, global maternal mortality remains excessively high, with approximately 287,000 deaths in 2020, 95% of which occurred in low- and middle-income countries [1]. Sub-Saharan Africa saw a reduction in maternal mortality by 33% between 2000 and 2020. Still, the maternal mortality ratio remains alarmingly high in the region [1]. Many of these deaths are preventable, yet

the global completion rate of MHC services remains low at 9.7% [9], with Sub-Saharan Africa reporting a rate of 25.0% [3] and 16.9% in Africa overall [10]. This disparity reflects the staggering maternal mortality rate in developing countries, where the risk of maternal death is 1 in 59 pregnancies, compared to 1 in 5,400 in high-income countries [1]. In Uganda, MHC service completion is estimated at 10.7% [11].

While national statistics indicate improvements in specific MHC services—68% of women aged 15–49 receive at least four antenatal visits, 86% of deliveries occur in health facilities, and 58% of mothers receive a postnatal checkup within the first two days—the maternal mortality ratio remains high at 189 deaths per 100,000 live births [12]. There is limited data on the completion of maternal health services along the care continuum, particularly in northern Uganda. Understanding these dynamics is critical for designing effective interventions to reduce maternal and perinatal morbidity and mortality [13, 14]. Additionally, disparities in MHC service utilization and completion persist in Uganda [14]. Factors such as demographic variations, socioeconomic status, cultural norms, education levels, parity, distance to health facilities, and mobility affect the completion of maternal health services [15–18].

The government of Uganda is the largest funder of MHC services, providing free care through public health facilities guided by the Uganda National Minimum Health Package, however, service delivery remains limited compared to international health standards [19]. Voucher schemes have been introduced to improve access to maternal and neonatal health services in poorer rural areas [19]. This study aimed to identify factors influencing of MHC service utilization and completion and along the care continuum.

## Methods

### Study design and setting

The study employed a descriptive cross-sectional design using quantitative data collection methods. The study was conducted at the outpatient department of a public general hospital in the Northern region of Uganda. This hospital is the only public facility at the hospital level in the district, primarily serving rural and peri-urban populations from Nebbi and surrounding districts, including Pakwach, Zombo, and Madi-Okollo. As a border district, the hospital also extends its services to patients from the Democratic Republic of Congo (DRC). Located in a hard-to-reach area, the hospital has a catchment population of 38,717 people, including approximately 1,936 women of reproductive age (15–49 years) as of the 2021/2022 financial year. During the financial year 2022/2023, the facility recorded 284 perinatal deaths and 18 maternal deaths, according to the Maternal and Perinatal Death Audit (FY

2022/2023) [20] the facility has a bed capacity of 210. The outpatient department operates Monday to Friday from 8:00 a.m. to 5:00 p.m. and is divided into emergency and low-risk units. Between April and June 2022, approximately 1,050 women of reproductive age attended the Outpatient Department (OPD) monthly [20]. The outpatient department offers services, including HIV counseling and testing, syphilis and tuberculosis screening, health education, general examinations and treatment, laboratory services, and referrals.

### Study participants

The study population included women of reproductive age (15–49 years) who had given birth seven weeks to one year prior to data collection. This timeframe was chosen in accordance with current postnatal care guidelines, which recommend postnatal visits up to six weeks after delivery [21]. Women between seven weeks and one year postpartum were deemed eligible to participate in the study. Exclusion criteria included women who were mentally unwell, too ill to participate or those who declined to provide informed consent.

### Sample and sampling procedure

The study enrolled 343 women in the study. The sample size was computed using the Kish Leslie formula. The assumption for the sample computation was based on the proportion of women that completed utilization of MHC services in Rwanda [22], a  $z$  value that corresponds to the 95% confidence interval (1.96) and the margin of error at 5%. The sampling criteria was based on the average daily attendance at the outpatient clinic, and all eligible women had an equal chance of participation. Participants were selected from the outpatient register and interviewed upon exiting the clinic.

### Measurements

The dependent variable was the completion of MHC services along the care continuum. This was defined as a woman attending at least four antenatal care visits, having a skilled birth attendance (SBA), and receiving three postnatal checkups, including visits within 24 h of birth, at 6 days, and at 6 weeks, all with a skilled birth attendant. Data on antenatal care attendance, skilled birth attendance, and postnatal care were collected using a structured questionnaire. Participants meeting the criteria for completion were coded as 1, and those who did not were coded as 0. Independent variables included sociodemographic factors such as age, nationality, marital status, education level, partner's education level, and distance to the facility. Obstetrical factors included parity, delivery mode, and the child's condition. Data on these variables were also captured through the structured questionnaire.

### Data collection tool and procedure

The interviews were conducted at the clinic exit using structured, interviewer-administered questionnaires. The researcher developed the questionnaire after a vigorous literature review [11, 23–26]. Each interview lasted between 30 to 60 min, allowing for a comprehensive collection of data while ensuring participant comfort and privacy. The questionnaire comprised two sections. Section one collected data on sociodemographic characteristics. These included characteristics such as age, education level, employment status, marital status, nationality and parity. Section two concentrated on the utilization of MHC services across the continuum of care. This included antenatal care attendance, skilled birth delivery, and postnatal care (Supplementary file 1).

Data collection commenced after obtaining approval from the Makerere University School of Health Sciences ethics committee and administrative clearance from the health facility and outpatient department in charge. In the waiting area, participants were provided with a detailed explanation of the study's purpose and procedures. This was done to ensure they fully understood the objectives, their role in the study, and the data collection process. Following this, their permission and informed consent were sought before their participation, ensuring that they voluntarily agreed to take part in the study and were aware of their right to withdraw at any time without consequence.

### Data analysis

Data analysis was conducted using Statistical Packages for Social Sciences (SPSS) version 18. Descriptive statistics for univariate analysis were presented as frequencies, percentages, and means. Bivariate and multivariate analyses were performed to identify factors associated with completing MHC services, with multivariable logistic regression used for further analysis. Variables with  $p \leq 0.05$  in the bivariate analysis were included in the logistic regression. A 95% confidence interval and a  $p$ -value of 0.05 were considered for significant associations.

## Results

### Socio-demographic characteristics

The average age of mothers attending OPD services at the facility was  $26 \pm 6.0$  years. More than half of the participants, 187 (54.5%), had less than a secondary level of education. Approximately three-quarters of the study participants, 218 (74.3%), were from rural catchment areas. More than half of the participants, 185 (53.9%), were not staying with their partners. Three-quarters of the 218 (63.6%) of the study participants were stay-at-home mothers (Table 1).

**Table 1** Sociodemographic characteristics of the participants (N = 343)

Variable		f (%)	Mean (SD)
Age groups	14–25	148 (43.1)	26 (6.0)
	26–35	167 (48.7)	
	36–49	28 (8.2)	
Residence	Urban	156 (45.5)	255 (74.3)
	Rural	255 (74.3)	
Nationality	Ugandan	218 (63.6)	88 (25.7)
	Congolese	88 (25.7)	
Marital status	Married	83 (24.2)	42 (12.2)
	Single	42 (12.2)	
	Separated	185 (53.9)	
Level of Education	None/primary	185 (53.9)	121 (35.3)
	Secondary	121 (35.3)	
	Tertiary	37 (10.8)	
Parity	One	65 (18.9)	211 (61.3)
	1–5	211 (61.3)	
	> 5	68 (19.8)	
Condition of the child	Alive	318 (92.4)	26 (7.56)
	Deceased	26 (7.56)	

**Table 2** Utilization of maternal health care services (N = 343)

Variable		f (%)
ANC Attendance	Yes	220 (64.1)
	No	123 (35.9)
Trimester at first ANC visit	First	33 (15.0)
	Second	125 (56.8)
	Third	62 (28.2)
Number of times of ANC Attendance	< 4 times	145 (65.9)
	4 times	42 (19.1)
	> 4 times	33 (15.0)
Skilled Birth Attendance	Skilled birth	209 (60.9)
	Others	134 (39.0)
Postnatal Care Attendance	Yes	313 (91.3)
	No	30 (8.7)
Attendance at 24 h	Yes	313 (91.3)
	No	30 (8.7)
Attendance at six days	Yes	84 (24.5)
	No	259 (75.5)
Attendance at six weeks	Yes	307 (89.5)
	No	36 (10.5)

### Utilization of maternal health care (MHC) services along the care continuum

#### Antenatal care

The majority of the participants 220 (64.1%) attended at least one ANC visit. However, only 33 (15%) of the participants started their ANC in their first trimester, 125 (65.8%) in their second trimester, and 62 (28.2%) in their third trimester. The majority (65.9%) attended less than four ANC visits, and only 33 (15.0%) attended more than four ANC visits (Table 2).

#### Skilled birth attendance

More than half of the participants, 209 (60.9%), were assisted by skilled birth attendants, whereas 103 (30.0%) and 31 (9.0%) were assisted by traditional birth attendants and attendants from their homes (Table 2).

#### Postnatal care visits

An overwhelming number, 313 (91.3%) of the mothers, reported attending at least one postnatal care visit regardless of where the delivery took place. More than half of the participants 209 (60.9%) of the study participants attended a postnatal check-up within 24 h. The minority of participants, 85 (24.5%), had a postnatal check-up on the sixth day. The majority of the participants, 307 (89.5%), reported having a postnatal check-up at 6 weeks (Table 2).

#### Completion of maternal health care services along the care continuum

Only 14% (95% CI 10.4–17.7) had completed MHC along the care continuum. Whereas 86% of the participants had incomplete utilization of MHC along the care continuum.

#### Factors associated with completion of MHC services completion

This study identified factors that were significantly associated with the completion of maternal health care services along the care continuum. Age and nationality were the two factors that were found to be statistically significant thus associated with the completion of MHC in this study. Other factors such as marital status, education level, residence, mode of delivery and condition or current state of the child were not statistically significantly associated with completion of maternal health services. This was true both at bivariate and multivariate analysis. At the bivariate analysis, participants aged 30 years or more were less like to complete MHC services along the continuum (OR, 0.24 CI (0.99 – 0.59),  $p = 0.01$ ). Participants from the democratic republic of Congo were more than twice likely to complete MHC services along the continuum compared to the nationals (OR, 2.65 (1.07–6.46),  $p = 0.05$ ). In the multivariate analysis, the two variables age and nationality remained statistically significant (Table 3).

#### Discussion

This study aimed to identify the factors associated with the completion of maternal health services along the care continuum among women attending a public health facility in the northern part of Uganda. The findings of this study indicate that completion of maternal health services along the care continuum was low at only 14%. It was also established that age and the nationality of the participants specifically women less than 30 years

**Table 3** Factors associated with completion of MHC services along the continuum

		Incomplete MHC services n (%)	Complete MHC services n (%)	Crude OR	p-value	Adjusted OR	p-value
<b>Age group</b>	< 30	223 (89.2)	27 (10.8)	Ref		Ref	
	> 30	73 (78.5)	20 (9.6)	0.24 (0.99–0.59)	0.01	0.24 (0.09–0.61)	0.013
<b>Marital status</b>	Married	190 (87.2)	28 (12.8)	Ref		Ref	
	Not Married	106 (66.6)	19 (33.4)	0.54 (0.23–1.25)		0.66 (0.33–1.29)	0.22
<b>Education level</b>	≤Primary	160 (86.5)	25 (13.5)	Ref			
	> Primary	136 (86.1)	22 (13.9)	1.2 (0.59–2.40)	0.62	0.66 (0.24–1.83)	0.68
<b>Residence</b>	Urban	160 (85.6)	27 (14.4)	Ref		Ref	
	Rural	136 (87.2)	20 (12.8)	1.2 (0.62–2.14)	0.67	0.97 (0.47–1.95)	0.91
<b>Nationality</b>	Ugandan	214 (83.9)	41 (16.1)	Ref		Ref	
	Congolese	82 (93.2)	6 (6.8)	2.6 (1.07–6.4)	0.03	2.65 (1.19–8.85)	0.05
<b>Mode of delivery</b>	Normal	85 (84.2)	16 (15.8)	Ref		Ref	
	C-section	211 (87.2)	31 (12.8)	1.3 (0.67–2.46)	0.46	1.35 (0.69–2.65)	0.38
<b>Condition of the child</b>	Not Alive	24 (99.0)	46 (14.5)	Ref		Ref	
	Alive	272 (85.5)	1 (4.0)	4.06 (0.54–30.7)	0.17	3.99(0.55–36.07)	0.18

of age and participants from the democratic republic of Congo were more likely to complete MHC care along the continuum.

Completion of maternal health services along the care continuum was only 14%, aligning with an earlier study in Uganda that reported a slightly lower completion rate of 10.7% [11]. The modest difference between the current study and the previous national study may be attributed to the broader national representation in the earlier research. These low completion rates underscore the ongoing challenges in ensuring full access to and utilization of essential maternal health services in Uganda. Studies in other African countries have reported varying completion rates for maternal health services. For instance, Ethiopia documented a completion rate of 21.6%, while Ghana reported a significantly higher rate of 66% [27, 28]. The stark difference between Ghana and Uganda is difficult to explain, considering the similar cultural contexts and healthcare challenges. A multi-country analysis in sub-Saharan Africa found that completion of health services was lowest in East Africa (17.9%) and highest in Southern Africa (51.5%) [29]. In this study, only 34.1% of participants reported attending at least four antenatal care (ANC) visits, which is considerably lower than the national average of 60% in Uganda [12, 30]. More than half of the participants (60.9%) had skilled birth attendance and this is also lower than the national average reported at 91% [30]. Additionally, 60.9% of participants had skilled birth attendance, also below the national average of 91%. While 91.3% of participants attended postnatal care (PNC) within 24 h after delivery, attendance dropped to 24.5% at six days, and 89.5% at six weeks postpartum. However, complete PNC attendance was low at 21%, consistent with findings from Uganda (22.5%) and Cambodia (26.4%) [11, 31]. These similarities suggest that various factors are influencing

PNC completion in both settings. The slight differences highlight the disparities in access to and utilization of maternal health services across the continent, emphasizing the need for targeted interventions to improve these rates in countries with lower completion. The low completion rates of maternal health services, particularly ANC and PNC, highlight critical gaps in the healthcare continuum. For midwifery practice, there is a need to strengthen antenatal education and follow-up to ensure mothers understand the importance of attending all recommended visits. From a policy perspective, improving accessibility and reducing barriers to maternal health services is essential.

#### Factors associated with the completion of maternal health services

This study identified two factors include age and nationality were the two factors that were found to be associated with the completion of MHC in this study. Other factors such as marital status, education level, residence, mode of delivery and condition or current state of the child were not found to be statistically significantly associated with completion of MHC services along the continuum.

Women who were less than 30 years of age were more likely to complete MHC services along the continuum. The findings are consistent with a multi-country study and similar research in Uganda, which reported lower odds of completion among women aged 35 and older [11, 29]. One might expect that older mothers (35 years and above), particularly those with higher parity, would be more likely to use maternal health services [32], this was the case in this study population. There is need for policymakers should focus on having in place targeted interventions for older mothers emphasizing the importance of MHC in later years and ant other misconceptions



around this. Factors such as residence, much as not associated with completion of MHC in this study. Studies around maternal health services identified residence as a determinant factor to service utilization. A study conducted in Nepal reported that participants from the rural areas were less likely to complete maternal health care services compared to those in urban settings [33]. Limited access to health facilities, greater distances, and cultural beliefs may contribute to this disparity [29]. In rural areas, pregnancy is sometimes hidden due to fear of witchcraft, which can further reduce health service utilization [34]. Strengthening rural health infrastructure with better transportation, mobile clinics, and community health workers is essential. Policymakers should prioritize outreach programs and engage community leaders to address cultural barriers.

The education level was also not found to be statistically significant in this study. Participants with tertiary education are inclined to greater odds of completion of maternal health care services along the care continuum. However this was not ascertained in this study [35, 36]. Educated individuals are better able to make informed health decisions and often have the financial resources to access care. Education campaigns should raise awareness among less-educated populations, while policies promoting women's education will improve long-term maternal health service utilization. Health professionals must provide clear, accessible information to all women, using workshops and visual aids to bridge knowledge gaps, especially for less-educated mothers.

This study revealed that participants from the Democratic Republic of Congo nearly three times greater odds of completing maternal health services compared to the Ugandan nationals. Much as insecurities due to armed conflict, political instability and violence make it difficult for women to access healthcare, or disrupt the health care system [37], displaced women took an effort to seek maternal health care services from the neighboring country Uganda. Midwives serving cross-border and refugee populations should be trained to provide culturally sensitive care. Additionally, strengthening security and infrastructure in conflict-affected regions is crucial. In addition, partnerships with international organizations can ensure access to maternal health services for women from war-torn areas.

### Policy and practice implications

The study funding imply that there is need for to facility staff to continuously sensitize women on the continuum of care and its importance. Utilization and strengthening of evidence based implementation models that integrate components of maternal health services. There is need to identify and challenges to utilization of maternal health care services. The ministry of health and other relevant

stakeholders should focus on policies that should prioritize increasing access to and awareness of maternal health care services to enhance the overall completion of care along the continuum.

### Study strengths and limitations

Although the large sample size enhanced the reliability of the results by reducing the margin of error and providing a broader perspective on factors influencing the completion of maternal health care along the care continuum, some limitations should be acknowledged. One concern is the reliance on self-reported data, which may introduce recall bias and potentially threaten the validity of the findings. To mitigate this, we employed a shorter recall period to improve the accuracy of participants' responses. We also acknowledge that the sample for this study was drawn from a hospital setting as opposed to a community setting which would have been the ideal setting. This could have biased the results of this study.

### Conclusions

This study identified a low level of MHC services completion. Factors including age and nationality specifically women less than 30 years of age and women who are from the Democratic Republic of Congo were more likely to complete MHC services along the continuum. There is need to continuously sensitize women about maternal health services to improve utilisation of the MHC services along the continuum. Interventions should focus on encouraging early initiation of antenatal care and provide individualised and women centered messages to cater for the uniqueness of the women. Interventions should prioritize on sensitizing women on the benefits of MHC service utilization in addition to enhancing accessibility, for women, rural populations. By tailoring interventions and policies to meet these specific needs, we can improve the utilization and completion rates of MHC services and ultimately improve maternal and child outcomes.

### Abbreviations

ANC	Antenatal Care
DRC	Democratic Republic of Congo
FY	Financial Year
HMIS	Health Management Information System
MHC	Maternal Health care
OPD	Outpatients Department
PNC	Postnatal care
SBA	Skilled Birth Attendance
SDG	Sustainable Development Goal

### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12913-025-12764-z>.

Supplementary Material 1.

### Authors' contributions

AP conceptualized the study and participated in data collection, NJ structuring of the study ideas, participated in data collection drafted the manuscript, PM and TDN participated in the data analysis, drafting, structuring, and editing of the manuscript. All authors reviewed the manuscript.

### Funding

This study did not receive any external funding.

### Data availability

All data has been provided within the manuscript.

### Declarations

#### Ethics approval and consent to participate

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and received approval from the Makerere University School of Health Sciences Institutional Review Board approved the research protocol (MAKSHSREC 2022–426). The facility in Northern Uganda and the outpatient department also granted administrative approval. After providing detailed information about study, participants provided informed consent. Privacy and confidentiality were maintained throughout the research. All procedures were carried out following the applicable guidelines and regulations.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare no competing interests.

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