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UTILIZATION OF PRECONCEPTION CARE AND ASSOCIATED FACTORS AMONG WOMEN ATTENDING ANTENATAL SERVICES IN OYAM DISTRICT, UGANDA: A HEALTH FACILITY-BASED STUDY

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ABSTRACT

Background: Preconception care is a critical component of maternal and child health. Despite its proven benefits in reducing maternal and neonatal morbidity and mortality, utilization of preconception care services remains low in many low- and middle-income countries, including Uganda. This study assessed the uptake of preconception care (PCC) and its associated factors among women of reproductive age attending ANC at Anyeke Health Center IV, Oyam District, Uganda.

Methods: This study employed a cross-sectional descriptive design utilizing quantitative methods of data collection. Associations were assessed using chi-square tests and binary logistic regression at 95% confidence level ($p \leq 0.05$).

Results: The prevalence of preconception care utilization was 59%. Uptake was significantly higher among participants aged 30–39 years (OR = 3.63, 95% CI: 2.080–6.351, $p = 0.02$), married women (OR = 7.5, 95% CI: 3.72–14.04, $p < 0.01$), and those who reported the presence of PCC services (OR = 5.3, 95% CI: 2.09–11.35, $p < 0.01$). Respondents with a waiting time of one hour or less were also more likely to utilize PCC services (OR = 2.3, 95% CI: 1.26–8.96, $p = 0.04$). Conversely, utilization was significantly lower among unemployed women (OR = 0.31, 95% CI: 0.31–0.96, $p < 0.01$).

Conclusion: PCC utilization was moderate at 59%, influenced by age, marital status, service availability, waiting time, and employment status. Conversely, unemployment was associated with lower uptake, underscoring the influence of socioeconomic barriers. These findings highlight the need to expand service

availability, reduce waiting times, and implement targeted interventions to improve PCC uptake and maternal-child health outcomes.

Keywords: Maternal health, Preconception care, Reproductive health services & Utilization.

INTRODUCTION

Preconception care (PCC) encompasses medical, behavioral, and social interventions aimed at optimizing the health of women and couples before conception, thereby improving pregnancy outcomes and long-term maternal and neonatal well-being (1). Despite its recognized importance in reducing adverse pregnancy outcomes, global utilization of PCC remains low, particularly in low- and middle-income countries (LMICs). In high-income settings, PCC uptake ranges from 33% to 47.7%, whereas in many LMICs, it remains below 30% (2). This inequity mirrors broader disparities in maternal health outcomes, with Sub-Saharan Africa continuing to bear a disproportionate share of the global maternal mortality burden—estimated at 533 deaths per 100,000 live births (3).

Across Africa, PCC uptake remains suboptimal. A recent meta-analysis estimated that only 19–24% of women of reproductive age utilize PCC services, while approximately one-third demonstrate adequate knowledge of preconception health (4,5). Such low engagement occurs against a backdrop of persistently high maternal and perinatal mortality. In 2017, Southern Asia and Sub-Saharan Africa together accounted for approximately 254,000 maternal deaths, representing 86% of the global total (6). Sub-Saharan Africa alone contributed an estimated 196,000 deaths—nearly two-thirds of all global maternal fatalities (7).

Although significant progress has been made in reducing maternal mortality across East Africa, the rates remain high compared with global targets. Between 2000 and 2017, maternal mortality ratios (MMRs) declined from 708 to 342 deaths per 100,000 live births in Kenya, from 1,160 to 248 in Rwanda, from 342 to 211 in Tanzania, and from 578 to 375 in Uganda (8). More recent estimates place Uganda's MMR at approximately 336 per 100,000 live births and Kenya's at 362 per 100,000 (9,10). Persistent gaps in reproductive health service coverage, including limited access to PCC, continue to hinder progress toward further reductions.

Studies from the region consistently report low levels of PCC utilization. In Kenya, a facility-based study in Machakos County found a utilization rate of 14.6%, significantly associated with women's employment status and ability to afford services (11). Similarly, in Ethiopia, PCC utilization was estimated at 16.3% (95% CI: 8.08–24.46), with only 30.9% of women demonstrating adequate knowledge of PCC (1). In Uganda, documentation and implementation of PCC remain limited; one study estimated a utilization rate of 28.8% among women of reproductive age (12).

In Northern Uganda, the Oyam District continues to experience preventable maternal and perinatal deaths despite ongoing maternal health interventions. According to District Health Information System 2 (DHIS-2) data, between January 2020 and July 2022, the district recorded 34 maternal deaths and 771 perinatal deaths

(13). These figures highlight ongoing challenges in maternal health preparedness, including inadequate uptake of preconception interventions.

Given the paucity of local data on preconception care utilization, this study aimed to assess the level of PCC uptake and associated factors among women of reproductive age attending antenatal care services at Anyeke Health Centre IV in Oyam District, Uganda.

METHODS

Study Design

A cross-sectional descriptive study employing quantitative methods was conducted to assess the utilization of preconception care (PCC) and associated factors among women of reproductive age. The design was appropriate for capturing data at a single point in time and identifying associations between PCC uptake (dependent variable) and selected sociodemographic and healthcare-related factors.

Study Area

The study was carried out at Anyeke Health Centre IV, located in Oyam District in Northern Uganda. The facility serves a catchment population of approximately 14,300 within the Oyam North Health Sub-District (14).

Target and Study Population

The target population comprised women of reproductive age (15–49 years) residing in Oyam District, while the study population included those attending antenatal care (ANC) services at Anyeke Health Centre IV during the study period.

Sample Size Determination

The sample size of 229 participants was calculated using the Kish and Leslie formula for a single population proportion, assuming a 95% confidence level, a 5% margin of error, and an estimated PCC utilization of 28.8% from a previous Ugandan study (12). This sample provided adequate statistical power ($\geq 80\%$) to detect significant associations between PCC uptake and explanatory variables.

Sampling Procedure

Systematic random sampling was used to select participants. Based on an average monthly attendance of 5,537 ANC clients and a desired sample of 229, every 24th eligible woman was selected ($K = 24$). The first participant was chosen by simple random draw from the first 24 attendees. If a selected woman declined participation or did not meet inclusion criteria, the next eligible attendee was enrolled.

Data Collection

Data were collected using a pre-tested semi-structured questionnaire administered by trained research assistants. The instrument captured (i) sociodemographic characteristics, (ii) PCC awareness and utilization, and (iii) health system-related factors influencing PCC uptake.

Data Analysis

Data were cleaned, coded, and analyzed using SPSS version 23. Descriptive statistics summarized participant characteristics. Associations between independent variables and PCC utilization were first assessed using Chi-square tests. Variables with $p \leq 0.05$ were entered into a binary logistic regression model to identify independent predictors while controlling for confounding. Adjusted odds ratios (AORs) with 95% confidence intervals were reported.

Ethical Considerations

Ethical approval was obtained from the Mount Kenya University Ethics Committee (MKU/ISERC/3065), the Clarke International University Ethics Committee (CLARKE-2024-1116), and the Uganda National Council for Science and Technology (UNCST/HS5626ES). Administrative clearance was also granted by the Oyam District Health Office and Anyeke Health Centre IV. Written informed consent was obtained from all participants, anonymity was maintained, and participation was voluntary.

RESULTS

Social demographic characteristics of the study respondents

A total of 229 women participated in the study. The majority (35%) were aged 20–29 years, followed by 30% aged 18–19 years and 29% aged 30–39 years. Most respondents (49%) had attained primary education, and over three-quarters (76%) were married. Approximately 40% had no children, while 37% had one to two children. In terms of occupation, 34% were housewives, 30% were unemployed, 22% were peasant farmers, and 14% were formally employed (Table 1).

Table 1: Socio-demographic characteristics

Variables	Category	Frequency	Percentages
Age	18-19 years	69	30%
	20-29 years	80	35%
	30-39 Years	67	29%
	40 years and Above	13	6%
Education Level	No Formal Education	34	15%
	Primary Level of Education	113	49%
	Secondary Level	59	26%
	Tertiary Level	23	10%
Marital Status	Single	39	17%
	Married	174	76%
	Separated	12	5%
	Divorced	2	1%
	Others	2	1%
Number of Children	None	92	40%
	1 to 2 Children	84	37%
	3 to 4 Children	39	17%
	Above 4 Children	14	6%
Occupation	Un Employed	65	30%

	Housewife	81	34%
	Formally Employed	32	14%
	Peasant Farmer	51	22%

Utilization of Preconception Care among Women of Reproductive Age

Out of the 229 respondents, 135 (59%) reported utilizing at least one of the WHO-recommended preconception care (PCC) services, while 94 (41%) had not. Among

those who utilized PCC, the most frequently accessed services were screening for anaemia (14.8%), counselling on smoking and alcohol use (14.0%), genetic counselling (9.2%), and contraceptive counselling (6.1%). These data are summarized in Table 2.

Table 2. Utilization of Preconception Care Services among Women of Reproductive Age (N = 229)

Preconception Care Service	Number of Women (n)	Percentage (%)
Overall Utilization		
Utilized at least one preconception care (PCC) service	135	59.0
Did not utilize any PCC service	94	41.0
Specific Preconception Care Services Utilized*		
Screening for sexually transmitted infections (STIs)	7	3.0
Iron supplementation	16	7.0
Education and general counselling	9	3.9
Contraceptive counselling	14	6.1
Genetic counselling	21	9.2
Advice on smoking and alcohol use	32	14.0
Screening for anaemia	34	14.8
Management of malnutrition	1	0.4†
Other services	2	0.9

Socio-demographic factors associated with utilization of preconception services

Bivariate analysis showed that PCC utilization was significantly associated with

age ($\chi^2 = 83.97$, $p < 0.001$), marital status ($\chi^2 = 22.28$, $p < 0.001$), number of children ($\chi^2 = 113.08$, $p < 0.001$), and occupation ($\chi^2 = 68.00$, $p < 0.001$). Education level was not significantly associated ($p > 0.1$).

Table 3: Socio-demographic Factors Associated with Utilization of Preconception Care Services (N = 229)

Characteristic	Category	Frequency (n)	Utilized PCC (Yes)	Did Not Utilize PCC (No)	χ^2	df	p-value
Age (years)	18–19	69	12	57	83.97	3	0.001*
	20–29	80	51	29			
	30–36	67	60	7			
	≥40	13	12	1			
Level of Education	No formal education	34	16	18	11.30	3	0.100
	Primary	113	59	54			
	Secondary	59	42	17			
	Tertiary	23	18	5			
Marital Status	Single	39	11	28	22.28	4	0.001*
	Married	174	110	64			
	Separated	12	10	2			
	Divorced	2	2	0			
	Others	2	2	0			
Number of Children	None	92	16	76	113.08	4	0.001*
	1–2	84	74	10			
	3–4	39	33	6			
	>4	14	13	1			
Occupation	Unemployed	65	20	45	33.07	5	0.001*
	Housewife	81	61	20			
	Formally employed	32	23	9			
	Peasant farmer	51	31	20			

Level of significance set at $\alpha = 0.005$.

Health system factors associated with utilization of preconception services

Availability of PCC services at the health facility was significantly associated with their utilization (**AOR = 5.30**, 95% CI: 2.09–11.35, $p = 0.004$). Similarly, respondents who

waited for one hour or less were **2.3 times** more likely to use PCC services than those who waited more than three hours (**AOR = 2.29**, 95% CI: 1.26–8.96, $p = 0.04$). Distance to the facility, payment requirements, drug availability, and staff friendliness were not significantly associated with PCC utilization.

Table 5: Health System Factors Associated with Utilization of PCC services (N = 229)

Characteristic	Category	Frequency (n / %)	Utilized PCC (Yes)	Did Not Utilize PCC (No)	χ^2	df	P-value
Distance from the health facility	< 1 km	55 (24.0%)	32	23	1.50	2	0.473
	2–3 km	118 (51.5%)	66	52			
	> 3 km	56 (24.5%)	37	19			
Availability of PCC services at facility	Yes	204 (89.1%)	127	77	9.36	2	0.009*
	No	22 (9.6%)	6	16			
Presence of community MCH services	Yes	178 (77.7%)	113	65	6.78	1	0.009*
	No	51 (22.3%)	22	29			
Payment for health services	Yes	15 (6.6%)	10	5	0.40	1	0.366
	No	214 (93.4%)	125	89			
Friendliness of health workers	Yes	225 (98.3%)	133	92	1.35	1	0.544
	No	4 (1.7%)	2	2			
Constant stocking of essential drugs	Yes	226 (98.7%)	134	92	0.82	1	0.370
	No	3 (1.3%)	1	2			
Waiting time at facility	≤1 hour	99 (43.2%)	66	33	8.49	3	0.037*
	2–3 hours	90 (39.3%)	52	38			
	>3 hours	38 (17.5%)	22	20			

Multivariate analysis of the factors associated with utilization of PCC services

In the multivariate logistic regression model, respondents aged 30–39 years were significantly more likely to utilize PCC services compared to those aged 18–19 years (AOR = 3.63, 95% CI: 2.08–6.35, $p = 0.02$).

Married women were approximately 7.5 times more likely to utilize PCC services than divorced women (AOR = 7.50, 95% CI: 3.72–14.04, $p = 0.005$). Conversely, unemployment was associated with a 69% reduction in the likelihood of PCC utilization (AOR = 0.31, 95% CI: 0.31–0.96, $p = 0.002$).

Table 6: Multivariate analysis of the factors associated with utilization of PCC services

Variable		P.value	Odds Ratio	95% Confidence Interval	
Characteristics	Category			Lower	Upper
Age	40 years and Above	0.32	.016	.002	1.137
	30-39years	0.02	3.63	2.080	6.351
	20-29years	0.12	.147	.018	1.185
	18-19 years		Ref		
Marital Status	Single	0.12	1.714	0.322	3.324
	Married	0.005	7.498	3.723	14.043
	Separated	0.07	2.181	0.933	6.063
	Divorced		Ref		
Number of Children	Above 4 Children	0.223	2.065	0.09	7.528
	3 to 4 Children	0.073	1.933	0.595	2.219
	1 to 2 Children	0.13	1.228	0.757	2.774
	None		Ref		
Occupation	Unemployed	0.002	0.309	0.306	0.963
	Housewife	0.061	.455	.427	7.639

	Peasant Farmer	0.282	3.050	.182	5.039
	Formally Employed		<i>Ref</i>		
Presence PCC services at the facility	Yes	0.004	5.302	2.087	11.347
	No		<i>Ref</i>		
Waiting Time	I hour and less	0.04	2.292	1.258	8.963
	2 to 3 hours	0.27	1.43	.101	1.797
	More than 3 hours		<i>Ref</i>		

DISCUSSION

Result indicate that more than half of the study respondents had utilized at least one of the WHO-recommended preconception care (PCC) services. This rate of PCC services is considerably higher than reports from several community-based African studies though those studies did not reach the exact specific PCC services utilized. For instance, in Ethiopia, PCC utilization of any PCC services varied from 15.8% in Debre Tabor to 18.2% in Mekelle City, while urban private hospitals in Addis Ababa reported a higher rate of 40% (15). In northern Ethiopia (Mekelle City), utilization was 18.2% (16). A similar study conducted in urban private maternal and child health hospitals in Addis Ababa, Ethiopia, reported a notably high uptake of 40% (17). The variation can be attributed to differences in study settings (community vs. facility-based), population characteristics, access to services, awareness levels, and integration of PCC into routine care.

The odds of utilizing preconception care (PCC) were significantly higher among older participants aged 30–39 years compared to younger participants aged 18–19 years. This trend aligns with evidence from Ethiopia, where women aged 34–49 had over 3.5 times higher odds of PCC utilization than those aged 15–24(18). Another study in Kenya

reported similar findings where women aged 30 or older had 2.5 times higher odds of receiving PCC compared to women under 30(19). These consistent findings suggest that older women, possibly motivated by previous pregnancy experiences, increased awareness of maternal risks, or proactive health engagement, are more likely to seek preconception care across diverse contexts.

Married women were approximately 7.5 times more likely to use PCC services compared to divorced respondents. Findings were concurrent with those of a study conducted in Kenya; utilization of preconception care was significantly higher among married women compared to single women (19). Married women often have greater emotional and logistical support from partners, which may facilitate access to PCC services. Being unemployed was associated with a 69% decrease in the odds of using PCC compared to the employed group. Findings were contrary to those of a study done in Ethiopia, where women in professional/technical/managerial occupations were 4.3 times more likely to utilize PCC compared to housewives (17). Employment enhances women's autonomy and decision-making power in household health matters, whereas unemployed women may depend on partners or family members, delaying or preventing health service use.

Study respondents who reported the presence of PCC services were approximately 5.3 times more likely to utilize these services compared to their counterparts. In an Ethiopian study among women visiting HIV care clinics, acknowledging the existence of a preconception care room within the facility was associated with a significantly higher likelihood of PCC utilization, 3.77 times greater than among those unaware of such a room (20). A waiting time of one hour or less was associated with a 2.3-fold increase in the likelihood of utilizing PCC services. Lengthy waits can lead to exhaustion, discouragement, or even women leaving before being attended to. Shorter waits keep the care-seeking process less stressful and more manageable. Findings agreed with those of a study done in Mozambique (21). However, a study done in South Africa reported no significant association between waiting times and PCC utilization (22).

Limitation

Data collection was restricted to women within a hospital setting, thereby excluding those who do not attend antenatal care (ANC) services and women in underserved community areas. This may have introduced selection bias and reduced the representativeness of the study population. Furthermore, the cross-sectional design of the study limited the ability to assess participants' behaviors over time, making it difficult to establish causal relationships between the variables examined. Recall bias was a potential limitation in this study; however, a well-crafted questionnaire was employed to minimize its effect.

Conclusion

This study found that 59% of respondents had utilized at least one WHO-recommended preconception care (PCC)

service. Utilization was significantly higher among women who had access to facilities offering PCC, experienced shorter waiting times, were older, married, or employed. Conversely, unemployment reduced the likelihood of uptake. These findings underscore the importance of both individual and health-system factors in influencing PCC utilization. To improve uptake, health facilities should ensure consistent availability of PCC services, reduce waiting times through better service delivery, and expand access to underserved groups such as unemployed and younger women. This study adds to the limited body of evidence on PCC utilization in Uganda, particularly in northern districts such as Oyam.

Authors' contribution: K.R. played a key role in data analysis and manuscript writing, K.R., R.M. & A.K.S.N. in the review of the manuscript. All authors read and approved the final manuscript draft.

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