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Original Research Article

Socio-demographic factors influencing the use of free maternal health services among pregnant women

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ABSTRACT

Background: Maternal health remains a major public health challenge, particularly in low- and middle-income countries. Despite Kenya's efforts to provide free maternal healthcare, maternal mortality rates remain high in Turkana Central Sub-County due to socio-cultural, economic, and infrastructural barriers.
Methods: A cross-sectional study was conducted in Turkana Central Sub-County to assess factors influencing the uptake of free maternal health services. Data were collected using structured questionnaires and focus group discussions. Quantitative data were analyzed using SPSS version 29, employing chi-square tests and logistic regression to examine associations between socio-demographic factors and service utilization. A significance level of $p<0.05$ was applied.
Results: The study included 210 participants, most aged 20-24 (16.2%) and married (49.0%). The majority were Christians (82.5%) and self-employed (63.3%), with 79.5% having no or only primary education. Age ($p=0.012$), parity ($p=0.011$), and household income ($p=0.013$) were significantly associated with service utilization, while marital status, religion, income source, and education level were not. Women aged 25-29 were less likely to utilize free maternal health services (OR=0.141, $p=0.007$), whereas lower-income women (Ksh. 0-2,500) were more likely (OR=2.584, $p = 0.036$). Higher income levels correlated with decreased uptake.
Conclusions: Age, parity, and household income significantly influenced the utilization of free maternal health services. Financial constraints remain a key determinant, with lower-income women more reliant on free services. Efforts to improve maternal health should prioritize increasing awareness and accessibility.

Keywords: Free maternal health services, Maternal health, Maternal mortality

INTRODUCTION

Maternal health remains a pressing public health issue worldwide, particularly in low- and middle-income countries where maternal mortality rates are disproportionately high.[1] Globally, reducing maternal mortality is one of the core objectives of the United Nations Sustainable Development Goals (SDGs), which aim to lower the maternal mortality ratio to fewer than 70 deaths per 100,000 live births by 2030.[2]

However, progress in Kenya has been slow, with maternal mortality still standing at an estimated 342 deaths per 100,000 live births, far exceeding the SDG target.[3] To address this issue, the Kenyan government has implemented policies providing free maternal health services to increase healthcare access for all pregnant women.

Yet, this initiative has seen limited success in some regions, particularly in Turkana Central Sub-County,

where maternal mortality rates remain critically high due to a combination of socio-cultural, economic, and infrastructural barriers.[4,5]

Turkana Central Sub-County, situated in Kenya's arid and semi-arid Turkana County, faces unique challenges that make access to maternal healthcare particularly difficult.[4] This region is marked by vast, remote landscapes with low population density, where many communities are located far from healthcare facilities.

Traditional beliefs and practices often discourage women from seeking formal healthcare, with many families favoring home births attended by untrained traditional birth attendants (TBAs) over facility-based care. Cultural norms in Turkana emphasize the role of TBAs in supporting childbirth, which, while culturally significant, exposes mothers and newborns to higher risks of complications.[5]

This preference for home births is influenced not only by cultural beliefs but also by limited awareness of the benefits associated with skilled maternal care. Studies show that less than 30% of women in Turkana are aware of the free maternal health services provided by the government.[6] Consequently, these low levels of maternal health knowledge contribute to a lack of demand for institutionalized healthcare, resulting in reduced utilization of potentially life-saving services. The objective of this study was therefore to examine socio-demographic factors influencing the use of free maternal health services among pregnant women.

METHODS

Study area

Turkana Central sub-county is located in the arid northeastern region of Kenya, within Turkana County. It has a limited number of health facilities, which are often located far from communities, exacerbating the difficulties women face in seeking maternal healthcare. Furthermore, the existing health facilities frequently suffer from inadequate staffing, limited medical supplies, and poor infrastructure. Maternal health indicators in Turkana Central Sub-County are generally lower than the national averages.

Study design

The study was cross-sectional in design and was conducted from July 2024 to November 2024.

Sample size determination

The sample size was obtained using the Fisher et al (1998) formula below. The uptake of maternal health services was estimated to be 58% with a design effect of one and a degree of error at 0.05.

$$n = \frac{Z * p * q * D}{(d^2)}$$

Where; n = Desired sample size, Z = Standard normal deviate 95% confidence interval corresponds to (1.96), p = the proportion of the target population estimated to have characteristics of interest (0.58)

q = 1-p

D = Design effect

d = Degree of error set at 0.05

$$n = \frac{1.96 * 0.58 * 0.42 * 1}{(0.05^2)}$$

= 240

Inclusion criteria

Participants were currently pregnant or had delivered a child within the last six weeks, participants were between the ages of 15 and 49 years, which encompassed the reproductive age group were included. Also, all participants must have been permanent residents of Turkana Central Sub-County for a minimum of two years to ensure they had a stable understanding of the local healthcare context and socio-cultural dynamics were included.

Exclusion criteria

Women who had not resided in Turkana Central Sub-County for at least two years were excluded from the study to ensure relevance to the local context were excluded. Also, women with severe medical or psychological conditions that might have impeded their ability to provide informed consent or participate meaningfully in the study were also excluded.

Data collection procedure

Initially, the researcher conducted training sessions for data collectors. This training covered the study objectives, data collection tools, ethical considerations, and effective communication techniques to ensure that the data collectors could engage with participants sensitively and respectfully.

The data collection process began with the identification of eligible participants based on the established inclusion criteria. The researcher collaborated with local health facilities, community health workers, and women's groups to facilitate outreach and recruitment of participants.

The research team conducted face-to-face interviews with participants. To enhance the reliability of the data, a pilot

test of the questionnaire was conducted with a small group of women who met the inclusion criteria before the full-scale data collection.

Data collection tools

The structured questionnaire was the main tool used to collect quantitative data. Focus group discussions were organized with small groups of pregnant women and recent mothers. This qualitative approach enabled participants to share their perspectives, experiences, and challenges in a supportive group environment, providing a richer context to the quantitative findings. All tools were pilot-tested and refined to ensure clarity, relevance, and cultural appropriateness before full-scale implementation.

Data management and analysis

Statistical Package for the Social Sciences (SPSS) version 29 was used in the analysis. Chi-square tests were used to examine associations between socio-cultural factors and the utilization of maternal health services, while logistic regression was employed to compare knowledge levels among different demographic groups. The significance level was set at $p<0.05$ to determine statistical significance.

Ethical approval

The study obtained ethical clearance from the Mount Kenya University Ethical Review Committee and a research permit from the National Commission for Science, Technology and Innovation.

RESULTS

Socio-demographic characteristics of the study participants

The largest group was composed of women aged 20-24 years, which accounted for 16.2% of the total sample (n = 43), followed by those aged 25-29 years and 30-34 years). A clear majority of participants were married, making up 49.0% of the sample (n = 103). Most women were predominantly Christians (n = 179, 82.5%). The majority of women in the sample had between one and three children, with the largest group being women with two children (33.3%). The income distribution among participants reveals that a significant majority, 63.3%, are self-employed. Monthly household income data shows a varied income distribution among the participants. The largest group, earning between 5,001 and 10,000 (31.0%, 65 participants), followed by those earning between 2,501 and 5,000 (24.3%, 51 participants). The educational attainment in the sample reveals a significant gap in access to higher education, with a large proportion of women having limited formal education. A combined 79.5% of participants have either no education (39.5%) or only primary education (40.0%) (Table 1).

Table 1: Socio-demographic characteristics of the study participant.

Socio-demographic characteristics of the study participant		N (%)
Age (in years)	15-19	23 (8.5)
	20-24	43 (16.2)
	25-29	29 (10.9)
	30-34	29 (10.9)
	35-39	27 (10.2)
	40-44	32 (12.1)
	≥45	27 (10.2)
Marital status	Single	66 (31.4)
	Married	103 (49.0)
	Widowed	17 (8.1)
	Divorced	24 (11.4)
Religion	Christian	179 (85.2)
	Muslim	22 (10.5)
	Other	9 (4.3)
Number of children	0	6 (2.9)
	1	43 (20.5)
	2	70 (33.3)
	3	41 (19.5)
	4	36 (17.1)
	5	14 (6.7)
Source of income	Employed	77 (36.7)
	Self-employed	133 (63.3)
Monthly household income	0-2,500	11 (5.2)
	2,501-5,000	51 (24.3)
	5,001-10,000	65 (31.0)
	10,001-15,000	47 (22.4)
	≥15,001	36 (17.1)
Level of education	None	83 (39.5)
	Primary	84 (40.0)
	Secondary	33 (15.7)
	Tertiary	10 (4.8)

Socio-demographics factors influencing the use of free maternal health services among pregnant women

In univariate analysis, age ($\chi^2(6, n=210) =16.260$, $p=0.012$), parity ($\chi^2(5, n=210) =14.839$, $p=0.011$) and the woman's monthly household income ($\chi^2(4, n=210) =12.665$, $p=0.013$) were significantly associated with free maternal health services. However, marital status ($\chi^2(3, n=210) =0.183$, $p=0.980$), religion ($\chi^2(2, n=210) = 0.469$, $p=0.791$), source of income ($\chi^2(1, n=210) =0.134$, $p=0.714$) and level of education ($\chi^2(3, n=210) =1.501$, $p=0.682$) did not display a significant association with service utilization (Table 2).

In binary regression, women aged 25-29 were less likely to utilize free maternal health services than those aged 15-19 (OR=0.141, 95% CI) [0.034, 0.584], p=0.007. Additionally, women aged 30-34 exhibited a trend toward lower uptake, though this did not reach statistical significance, with an OR of 0.303, 95% CI [0.081, 1.137], p = 0.077.

Table 2: Socio-demographic predictors of free maternal services.

Socio-demographic characteristics	Utilized free maternal services (%)	Did not utilized free maternal services (%)	P value (95% CI)
Age in years			
15-19	8 (6.0)	15 (19.5)	0.012
20-24	23 (17.3)	20 (26.0)	
25-29	24 (18.0)	5 (6.5)	
30-34	21 (15.8)	8 (10.4)	
35-39	19 (14.3)	8 (10.4)	
40-44	21 (15.8)	11 (14.3)	
≥45	17 (12.8)	10 (13.0)	
Marital status			
Single	42 (31.6)	24 (31.2)	0.980
Married	66 (49.6)	37 (48.1)	
Widowed	10 (7.5)	7 (9.1)	
Divorced	15 (11.3)	9 (11.7)	
Religion			
Christian	115 (86.5)	64 (83.1)	0.791
Muslim	13 (9.8)	9 (11.7)	
Other	5 (3.8)	4 (5.2)	
Parity			
0	1 (0.8)	5 (6.5)	0.011
1	20 (15.0)	23 (29.9)	
2	51 (38.3)	19 (24.7)	
3	26 (19.5)	15 (19.5)	
4	26 (19.5)	10 (13.0)	
5	9 (6.8)	5 (6.5)	
Source of income			
Employed	50 (37.6)	27 (35.1)	0.714
Self-employed	83 (62.4)	50 (64.9)	
Monthly household income			
0-2,500	3 (2.3)	8 (10.4)	0.013
2,501- 5,000	27 (20.3)	24 (31.2)	
5,001-10,000	46 (34.6)	19 (24.7)	
10,001-15,000	35 (26.3)	12 (15.6)	
≥15,001	22 (16.5)	14 (18.2)	
Level of education			
None	51 (38.3)	32 (41.6)	0.682
Primary	54 (40.6)	30 (39.0)	
Secondary	23 (17.3)	10 (13.0)	
Tertiary	5 (3.8)	5 (6.5)	

Marital status did not show a significant impact on service uptake. While widowed women had a positive but non-significant association, OR=1.399, 95% CI [0.370, 5.293], p=0.621, divorced individuals also showed no significant difference in uptake, with an OR of 1.525, 95% CI [0.518, 4.491], p=0.444.

Monthly household income revealed a noteworthy trend. Those in the lowest income bracket (Ksh. 0-2,500) were significantly more likely to use the services, with an OR of 2.584, 95% CI [1.064, 6.305], p=0.036. In contrast, higher income levels were associated with lower uptake, particularly in the Ksh. 5,001-10,000 range (OR = 0.141, 95% CI [0.028, 0.712], p=0.018) and the Ksh. 10,001-15,000 range (OR = 0.114, 95% CI [0.022, 0.603], p=0.011).

Parity also played a role in uptake. Women with two children approached significance, showing an OR of 0.099, 95% CI [0.009, 1.056], p=0.055. Trends indicated lower uptake for women with three, four, and five children, with ORs of 0.132, 95% CI [0.011, 1.549], p=0.107, and 0.106, 95% CI [0.009, 1.271], p=0.077, respectively. The model explained approximately 17.8-24.4% of the uptake of maternal health services (-2 Log likelihood=234.719, Cox & Snell R^2 = 0.178, Nagelkerke R^2 = 0.244) (Table 3).

Table 3: Binary regression model for socio-demographic characteristics of the study participants.

	B	S.E.	Wald	df	Sig.	OR	95% C.I. for OR	
							Lower	Upper
Age in years								
15-19			9.427	6	0.151	Ref		
20-24	-0.566	0.630	0.805	1	0.370	0.568	0.165	1.954
25-29	-1.958	0.724	7.305	1	0.007	0.141	0.034	0.584
30-34	-1.195	0.675	3.133	1	0.077	0.303	0.081	1.137
35-39	-1.162	0.677	2.946	1	0.086	0.313	0.083	1.179
40-44	-1.031	0.658	2.455	1	0.117	0.357	0.098	1.295
≥45	-0.695	0.673	1.067	1	0.302	0.499	0.134	1.865
Marital status								
Single			0.965	3	0.810	Ref		
Married	-0.018	0.386	0.002	1	0.964	0.983	0.461	2.093
Widowed	0.336	0.679	0.245	1	0.621	1.399	0.370	5.293
Divorced	0.422	0.551	0.585	1	0.444	1.525	0.518	4.491
Religion								
Christian			0.149	2	0.928	Ref		
Muslim	-0.065	0.544	0.014	1	0.905	0.937	0.323	2.723
Other	0.297	0.852	0.122	1	0.727	1.346	0.253	7.150
Parity								
0			10.455	5	0.063	Ref		
1	-1.171	1.225	0.913	1	0.339	0.310	0.028	3.423
2	-2.310	1.206	3.667	1	0.055	0.099	0.009	1.056
3	-2.022	1.255	2.596	1	0.107	0.132	0.011	1.549
4	-2.240	1.265	3.134	1	0.077	0.106	0.009	1.271
5	-1.518	1.352	1.260	1	0.262	0.219	0.015	3.104
Source of income								
Self-employment	-0.004	0.345	0.000	1	0.991	0.996	0.506	1.960
Monthly household income (Ksh.)								
0-2,500			10.288	4	0.036	Ref		
2,501-5,000	-1.088	0.816	1.777	1	0.182	0.337	0.068	1.668
5,001-10,000	-1.957	0.825	5.620	1	0.018	0.141	0.028	0.712
10,001-15,000	-2.170	0.849	6.532	1	0.011	0.114	0.022	0.603
≥15,001	-1.506	0.843	3.188	1	0.074	0.222	0.042	1.158
Level of education								
None			2.584	3	0.460	Ref		
Primary	-0.137	0.391	0.122	1	0.726	0.872	0.406	1.876
Secondary	-0.476	0.529	0.810	1	0.368	0.621	0.220	1.752
Tertiary	0.851	0.792	1.155	1	0.282	2.342	0.496	11.061
Constant	3.836	1.507	6.482	1	0.011	46.360		

DISCUSSION

The significant association between age and service use is consistent with other recent studies, which have also highlighted those younger women, tend to have lower utilization rates of maternal healthcare services. This can be attributed to various factors, including limited access to information, social stigma, or barriers related to fear of judgment, which are particularly relevant to younger populations in many low-resource settings.[1,7] A similar trend has been observed in studies focusing on adolescent pregnancy, where younger women are more likely to avoid seeking formal healthcare due to socio-cultural and logistical challenges.[7]

Interestingly, marital status did not significantly influence service use in this study, which contrasts with findings from some other studies that suggest marital status can be an indicator of healthcare utilization, particularly in societies where married women may have better access to resources and decision-making autonomy.[8,9] However, in this context, the lack of a significant relationship may reflect broader social dynamics or cultural factors that

minimize the influence of marital status on healthcare access.

Similarly, religious affiliation did not affect the likelihood of using free maternal services. While religious beliefs can sometimes influence health-seeking behavior, particularly in areas where specific religious groups have different health practices, recent studies indicate that the availability and accessibility of services often outweigh religious factors when it comes to maternal health utilization.[10,11]

This study also did not observe any relationship between the number of children a woman had and the utilization of free maternal services. However, studies suggest that women with more children tend to experience greater maternal health risks, thus increasing their likelihood of using free services, as they may require more frequent medical attention during pregnancies or childbirth.[12,13]

Employment status in this study did not affect the decision to use free maternal services. The lack of a significant relationship between employment and service utilization contradicts other research that finds employment status predicts the utilization of maternal healthcare services.[14]

However, monthly household income was significantly associated with service use, which is consistent with the literature highlighting that lower-income households are more likely to rely on free maternal health services due to financial constraints.[15,16]

This suggests that education level did not play a major role in deciding to use free maternal healthcare services. Thus, the lack of a significant relationship between education level and service use in this study contradicts some research that has found maternal education to be a key determinant of healthcare utilization.[17,18]

However, in contexts where free services are available, financial barriers may be more influential than education in deciding whether to seek care.[19,20] This suggests that despite educational attainment, access to services may be the more critical determinant in this population.

CONCLUSION

The study highlights that age, parity, and household income significantly influence the utilization of free maternal health services, with younger women and those from lower-income households more likely to seek care. In contrast, higher income levels and increasing parity were associated with lower uptake. Marital status, religious affiliation, employment status, and education level did not significantly impact service use, suggesting that financial constraints may be the primary determinant in this context. These findings emphasize the need for targeted interventions to address economic and age-related barriers to maternal healthcare access.

This study has few limitations. The study's cross-sectional design limits the ability to establish causality between socio-demographic factors and maternal health service utilization. Reliance on self-reported data may introduce recall bias or social desirability bias, affecting the accuracy of responses. The findings may not be generalizable to other regions with different socio-cultural and economic contexts beyond Turkana Central Sub-County. The exclusion of recent migrants and women who have lived in the area for less than eight years may result in potential sampling bias, overlooking diverse healthcare-seeking behaviors.

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