International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Kibet PJ et al. Int J Reprod Contracept Obstet Gynecol. 2025 Dec;14(12):4083-4089
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20253870

Original Research Article

Knowledge, attitudes and perceptions towards utilization of bilateral tubal ligation among married women of reproductive age (15-49 years) in Kasgunga Ward, Homabay County, Kenya

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Received: 12 October 2025
Accepted: 28 October 2025

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ABSTRACT

Background: Approximately 20% of women of reproductive age in developing countries would prefer to ultimately stop bearing children after attaining their desired family size, however, they are faced with over 26% rate of unmet modern family planning methods such as bilateral tubal ligation (BTL). Objectives were to assess knowledge, attitude and perceptions on the utilization of BTL among the married women in Kasgunga ward and to measure the association between education level, income, number of children and the use of BTL.
Methods: A cross-sectional study design was used to collect data related to knowledge, attitude and perceptions among 399 married women in Kasgunga Ward, Homabay County, Kenya.
Results: Only 36 (35.1% of those who had reached the desired number of children said they would consider using BTL after discussing it with their husbands. Eighty-two (79.6%) of study participants cited not considering busing BTL as it was against their culture, and 137 (66%) that it was against their religious beliefs. Forty-nine (47.2%) of the women would go on to have BTL, whether or not their husbands approved of it. The cross-tabulation indicated that the use of BTL was most common among women with more than 5 children (80.0%) compared to 20.0% in women with 3-5 children and none in those with 0-2 children, with a statistically significant association, $\chi^2(2)=107.75$, $p<0.001$.
Conclusions: This study demonstrated that knowledge, attitudes, and perceptions influence the utilization of BTL among married women of reproductive age.

Keywords: Knowledge, Attitudes, Perceptions, Women of reproductive age, Tubal ligation

INTRODUCTION

Bilateral tubal ligation (BTL), also known as "tying of tubes", is a permanent family planning method where the fallopian tubes are severed or tied, to prevent pregnancy.[1] The procedure takes about 15-20 minutes, and done under sedation.[1]

World health organization (WHO) recognizes the role of family planning in achieving the human right to regulate their family sizes and sizes to their preferred sizes depending on such factors like level of income. The benefits of proper family planning and having the manageable family size cannot be underestimated. Research reveals the dire consequences of below two-year gap of births as 45% increase in infant mortality.[2]

Approximately 20% of women of reproductive age in developing countries would prefer to ultimately stop bearing children after attaining their desired family size, however, they are faced with over 26% rate of unmet modern family planning methods such as BTL.[9] Unlike other contraceptive methods, BTL does not disrupt the hormonal balance, and highly effective on preventing unexpected pregnancy. The possibility of getting pregnant after undertaking tubal ligation is: 5% in women aged 27 years and below, 2% in women aged 28 to 33, and 1% in women aged 34 years and above.[2] It is unfortunate that

about 18% of women of reproductive age desiring to avoid unplanned pregnancies do not utilize any family planning methods.[4] There is 53% of unmet needs for modern family planning methods among the women of reproductive age in Africa.[4] This is the best breeding ground for several unplanned pregnancies that have delirious impact in the health, economic, and social aspects of the women, their families and the entire nation.

Despite being the best and most efficient type of contraception, BTL is still not widely used Globally, more so in Africa.[9] However, the use of BTL in African countries is low due to strong dislike and irreversibility of the procedure. The use of BTL in Nigeria is low (1% to 3.15%) due to desire for large family sizes, unavailability of BTL, lack of understanding of the benefits, misconceptions.[9] In Ethiopia, BTL is the least common family planning method among women aged 30 years.[5]

Awareness, unsupportive husbands and attitude are examples of barriers influencing the use of BTL. Inadequate knowledge and negative attitude towards BTL are major reasons of its non-acceptance among married women. In Kenya, the use of BTL has declined from 3.2% in 2014 to 2.3% in 2022.[7] The low uptake of tubal ligation in Kenya, shows that there is still a need to conduct research on the barriers to use of BTL, and the greatest barriers being level of knowledge, attitude and perceptions towards the use of BTL.

Prevention of unplanned pregnancies requires effective and reliable family planning methods. BTL is highly ranked among the reliable forms of family planning. Generally, BTL has a significantly low failure rate of 0.5% in the first year of use and 1.85% in 10 years of use.[4]

METHODS

Study type

Descriptive cross-sectional design was employed since data collection was done at one point in time, within a short period, and among different respondents. The study design was chosen since it enabled assessment of the contraceptive use, knowledge, and attitude on the use of BTL among married women in the study area.

Study place and period

The study was done in Kasgunga Ward of Mbita Sub-County in Homabay County between (January 2025-May-2025). Kasgunga is about 30 km from Homabay Town and is found along the shores of Lake Victoria. This was a community-Cross-sectional based study data was collected at local health facilities offering tubal ligation and other family planning methods and also from the married women in the reproductive age bracket themselves. The Ward has approximately 6,342 households. The dominant ethnic communities in the ward are the Luo and Suba. The climatic condition of the ward is hot and wet. The main economic activities are fishing, subsistence farming, small-scale businesses, and charcoal burning.

Selection criteria

The study population consisted of married women between ages 18 and 49 years in Kasgunga Ward. Married women's suitability as respondents for this study was based on the fact that male partner disapproval is an identified key barrier to tubal ligation among married women in Kenya.[6]Age eighteen (18) was selected as the lower limit to emphasize the legality of BTL. Age forty-nine (49) was the upper limit since beyond this age, women reach menopause and will have likely achieved their desired family size. Desired family size is among the influencing factors to the use of BTL among women.[6]

Procedure

Homabay County was selected by purposive sampling among the other 47 counties in Kenya due to low use of BTL despite the method being available in the area. Kasgunga Ward was selected by simple random sampling among the other 4 wards in Homabay County. Simple random sampling was employed to select the married women in the ward. An interviewer-administered schedule was utilized. Research assistants, who were well trained, collected the data using a translated tool in Kiswahili. All respondents were approached individually, and the purpose of the study was explained before obtaining informed consent. Privacy and confidentiality were ensured during interviews.

Ethical approval

Ethical review of the study was obtained from Kabarak university research ethics committee (KUREC A10823). Permission to conduct the study was obtained from NACOSTI. Community entry was facilitated by permission from the sub-chiefs of sub-locations within the ward to facilitate easier implementation of the study. The researcher issued informed consent forms to the respondents to obtain their voluntary participation. Confidentiality of participants was strictly maintained; personal identifiers were not collected, and data were stored in password-protected files accessible only to the research team. Participants were assured that their responses would remain anonymous and used solely for research purposes.

Statistical analysis

The independent variables included knowledge, perceptions, and attitude towards BTL, while the dependent variable was utilization of BTL. A sample size of 399 study participants was arrived at using the fisher's formula. Descriptive statistics were used to summarize participants' socio-demographic characteristics, knowledge, attitudes, and perceptions. Inferential

statistics, including Chi-square tests, were applied to determine associations between socio-demographic variables (education, income, and number of children) and utilization of BTL, with significance set at $p<0.05$. The data were analyzed using SPSS version 23.

RESULTS

Socio-demographic characteristics

Three hundred and ninety-nine married women participated in the study. Out of the 399 study participants, 177 (44.4%) were aged between 28-37 years, 162 (40.6%) were aged between 18-27 years, while 60 (15%) were aged between 38-49 years. Majority of the study participants 195 (48.87%) had attained primary level education, 160 (40.10%) secondary level of education, 20 (10.28%) tertiary level, and 1 (0.75%) with no formal education. In religion, 392 (98.50%) of the study participants were Christians, 5 (1.25%) were Muslims, and 1 (0.25%) were in other religions. Two hundred and ninety-five (73.9%) had between 5000-15000 Kenya shillings income,79 (19.8%) had no income, 16 (4.0%) had above 26000 Kenya shillings income and 9 (2.3%) had between Kenya shillings 16000-26000). Majority of the study participants 234 (58.65%) had between 3-5 children, 150 (37.59%) had more than 5 children and 15 (3.76%) had between 0-2 children. Regarding whether the study participants had attained the desired number of children, 153 (38.4%) cited that they had not attained their desired family size, 138 (34.6%) mentioned that they had attained their desired family size and 107 (27%) were not sure on whether or not they had attained their desired family size. Table 1 shows the summary of the socio-demographic characteristics of the study participants.

Table 1: Socio-demographic characteristics.

Characteristics	N	Percentage
Age (in years)		
18-27	162	40.6%
28-37	177	44.4%
38-49	60	15%
Religions		
Christianity	392	98.50%
Islam	5	1.25%
Others	1	0.25%
Level of income (in Kshs)		
No income	79	19.8%
5000-15000	295	73.9%
16000-26000	9	2.3%
Above 26000	16	4.0%
Number of children		
0-2	15	3.76%
3-5	234	58.65%
Above 5	150	37.59%
Reached desired number of children		
Yes	138	34.6%
No	153	38.4%
Not sure	107	27%

Knowledge, attitude and perceptions of study participants towards BTL

The study found that 153 (38.4%) of the study participants had reached their desired number of children, 138 (34.6%) mentioned that they had not reached their desired number of children, while 107 (27%) were not sure if they still wanted more children. Out of the 210 using contraceptives, only 42 (20%) were using BTL, and the others were using the other contraceptive methods. Those not using any family planning method cited reasons to be perceived side effects 128 (67.6%, partner not approving of it 38 (20%), religion 5 (2.8%) and 38 (9.6%) citing other reasons. Only 27 (25.8%) had heard about BTL, while 76 (74.2%) had never heard about BTL. The information about BTL was acquired through relatives and friends 48 (46.6%), hospital 46 (44.7%), self-study 4 (3.9%) and social forums 3 (2.9%). On whether they understood BTL as a permanent family planning method, 98 (95.1%) reported understanding its nature, and 5 (4.9%) did not understand its nature. Ninety-five (92.2%) perceived BTL as being a very effective family planning method, but 8 (7.8%) did not see it as an effective family planning method. Seventy-two (69.9%) agreed that BTL has side effects, and 31 (30.1%) said that BTL does not have any side effects. Decisions regarding family planning are majorly done by husbands 137 (66%), followed by joint decision making by both husband and wife 65 (31.1%) and only wife 65 (31.1%). Majority of the women had never discussed BTL as a family planning option with their partners 89 (86.4%), and only 14 (13.6%) had ever discussed it with their husbands about it. Only 36 (35.1% of those who had reached the desired number of children said they would consider using BTL while 67 (64.9%) would not opt for BTL. Regarding cultural acceptability, 36 (35.1%) said that use of BTL was against their culture, while 67 (64.9%) had no cultural issues with BTL. Forty-two (40.3%) of the women were afraid that BTL would affect their sexual life negatively, and 61 (59.7%) did not believe in BTL negatively affecting their sexual life. Sixty-eight (66%) mentioned that their religion was against the use of BTL, while 35 (34%) did not have any religious issue with the use of BTL. Forty-nine (47.2%) of the participants would still use BTL even if their husbands were against it, while 54 (52.8%) would not challenge their husbands' decision. Lastly, 64 (62%) of the study participants said they feared anyone knowing that they were using BTL, while 36 (38%) had no worries about people knowing they were using BTL.

Inferential statistics

Level of education and the use of BTL

The cross-tabulation (Table 3) shows that among the 210 women who use contraceptives, 77 (36.7%) have primary education, 103 (49.0%) have secondary education, 23 (11.0%) have a college degree, and 7 (3.3%) have a university degree. BTL was reported among 20.0% of women with primary education, 20.0% with secondary, 30.0% with college, and 30.0% with university education.

The Chi-square test reveals that women with higher education levels were significantly more likely to undergo BTL compared to those with primary or secondary education, $\chi^2(3) = 28.48$, $p<0.001$.

The level of income and the use of BTL

The association between the level of income and the use of BTL was studied among 210 women who use contraceptives.

The cross-tabulation indicated that among these women who use contraceptives, 60 (28.6%) earned less than 10,000, 114 (54.3%) between 10,000-30,000, 20 (9.5%) between 31,000-50,000, 7 (3.3%) between 51,000-70,000, and 9 (4.3%) above 70,000.

The Chi-square test indicated that use of BTL was highest among women earning more than 70,000 (40.0%) and lowest among those earning 10,000-30,000 (0.0%), with a statistically significant association, $\chi^2(4)=47.18$, $p<0.001$).

Number of children and the use of BTL

Further analysis of the association between the number of children and the use of BTL shows that among the 210 women who use contraceptives, 62 (29.5%) had 0-2 children, 136 (64.8%) had 3-5 children, and 12 (5.7%) had more than 5 children. The cross-tabulation indicated that the use of BTL was most common among women with more than 5 children (80.0%) compared to 20.0% in women with 3-5 children and none in those with 0-2 children, with a statistically significant association, $\chi^2(2)=107.75$, $p<0.001$.

Table 2: Questions related to knowledge, attitude and perceptions on BTL and the respective responses.

Questions related to knowledge, attitude and perceptions on BTL	Responses		
	Yes	No	Not sure
Have reached their desired number of children	138 (34.6%)	153 (38.4%)	107 (27%)
Currently using contraceptives	210 (52.63%)	189 (47.37%)	
Type of contraceptive method used			
Other methods (injectable, implants, intrauterine devices, oral contraceptives, and others)	168 (80%)		
BTL	42 (20%)		
Reason for not using any contraceptive			
Perceived negative side effects	128 (76.1%)	40 (23.9%)	
Partner not approving of using family planning	90 (53.57%)	78 (46.42%)	
Religion	70 (41.67%)	98 (58.33%)	
Culture	38 (22.62%)	130 (777.38%)	
Ever heard of BTL	27(25.8%)	76 (74.2%)	
Source of information about BTL			
Relatives and friends	48 (46.6%)		
Hospital	46 (44.7%)		
Self-study	4 (3.9%)		
Social forums	3 (2.9%)		
Television and radio	2 (1.9%)		
Understand that BTL is a permanent contraception method	98 (95.1%)	5 (4.9%)	
Perception of BTL as an effective family planning method	95 (92.2%)	8 (7.8%)	
Whether BTL has side effects	31 (30.1%)	72 (69.9%)	
Decision maker in matters family planning			
Husband	137 (66%)		
Husband and wife	65 (31.1%)		
Wife	6 (2.9%)		
Ever discussed possibility of using BTL with partner	14 (13.6%)	89 (86.4%)	
Will consider using BTL when I reach my desired family size	36 (35.1%)	67(64.9%)	
BTL is against my cultural beliefs	82 (79.6%)	21(20.4%)	
My religion is against use of BTL	68 (66%)	35 (34%)	
I can still have BTL even if my spouse is against the decision	49 (47.2%)	54 (52.8%)	
BTL can affect my sexual life negatively	42 (40.3%)	61 (59.7%)	
I fear what people will say if they know I am using BTL	64 (62%)	36 (38%)	

Table 3: The association between the education level and the BTL among women who use contraceptives.

Education level	BTL use, N (%)			Chi-test statistic	P value
	Yes	No	Total		
Primary	2 (20.0)	75 (37.5)	77 (36.7)	$\chi^2(3)=28.48$	<0.001
Secondary	2 (20.0)	101 (50.5)	103 (49.0)		
College	3 (30.0)	20 (10.0)	23 (11.0)		
University	3 (30.0)	4 (2.0)	7 (3.3)		
Total	10 (100)	200 (100)	210 (100)		

Table 4: The association between the level of income and the BTL among women who use contraceptives.

Level of income (KSh)	BTL use, N (%)			Chi-test statistic	P value
	Yes	No	Total		
<10,000	2 (20.0)	58 (29.0)	60 (28.6)	$\chi^2(4)=47.18$	<0.001
11,000-30,000	0 (0.0)	114 (57.0)	114 (54.3)		
31,0000-50,000	2 (20.0)	18 (9.0)	20 (9.5)		
51,000-70,000	2 (20.0)	(2.5)	7 (3.3)		
>70,000	4 (40.0)	5 (2.5)	9 (4.3)		
Total	10 (100)	200 (100)	210 (100)		

Table 5: The association between the number of children and the BTL among women who use contraceptives.

Number of children	BTL use, N (%)			Chi-test statistic	P value
	Yes	No	Total		
0-2 (year)	0 (0.0)	62 (31.0)	77 (29.5)	$\chi^2(2)=107.75$	<0.001
3-5	2 (20.0)	134 (67.0)	136 (64.8)		
> 5	8 (80.0)	4 (2.0)	12 (5.7)		
Total	10 (100)	200 (100)	210 (100)		

DISCUSSION

This study examined how knowledge, attitudes, and perceptions influence the uptake and use of BTL among married women of reproductive age, emphasizing the significance of demographic, social, cultural, and economic factors in family planning methods. In the analysis of demographic data, the findings showed that the majority of the study participants (85%) were in reproductive ages between 18 and 37 years, Christian (98.5%), earning income between KSh. 5000-15,000, 58.65%, having 3-5 children (58.65%), and attained the desired number of children (34.6%). These demographic data reflect the socio-economic status of women in Kenya, as reported in previous studies conducted in studies regarding family planning.[8-10] The predominance of Christianity is in line with the national census reports, and this implies that religious beliefs would have a significant influence on the choices of family planning methods. The low levels of income among participants are reflective of the economic activities predominantly conducted in rural settings. Given that the majority of participants had between three and five children, with a lower proportion indicating that they had attained the desired number of children, this reveals a high fertility rate, which is common in rural settings in Kenya.

Findings of knowledge, attitudes, and perceptions among participants show that about half (50%) are using contraceptives, a quarter (25%) indicated that they are aware of BTL, and a fifth are using BTL (20%). These findings show that half of the women are not using contraceptives, possibly due to the low level of awareness and negative attitudes or perceptions, as reported in previous studies.[2,4,8]Among the 20% of participants who utilized BTL, most of them perceived that it is an effective and safe method of family planning, while a minority of them indicated having some side effects. The negative perceptions of family planning methods usually stem from a low level of awareness, cultural values, and religious beliefs.[10] In their family planning decisions, participants reported that their husbands decided on the nature and type of family planning methods they use. This finding aligns with those from previous studies, which demonstrated that husbands play a central role in decision-making regarding family planning methods in patriarchal societies**.** Therefore, women tend to be reluctant to discuss their choices of family planning methods since they fear that their husbands and society would influence their decisions.

Further analysis of the findings indicated that educational level, level of income, and the number of children are significant factors that influence utilization of BTL services among the participants. The study demonstrated

that women with a higher level of education are likely to use BTL as their preferred family planning method. This finding implies that women with higher level of education can make informed decisions regarding their reproductive health.[11] Regarding level of income, participants who earn higher incomes are likely to use BTL services. This observation occurs because BTL services are expensive, and only women who can afford them are likely to procure.[4,6] Regarding number of children, participants who had a higher number were more likely to use BTL as their family planning method. This observation is consistent with global trend that women who have attained their desired family size tend to use BTL services.[3,8] Hence, education, income, and number of children are factors that predict likelihood of women using BTL services.

Limitations

The cross-sectional design recorded the data at a given time and this could not allow ing causal relationship between the variables (knowledge, attitudes, perceptions and use of BTL). Second, the respondents were required to self-report their data, which could cause a recall bias or social desirability bias (especially when it comes to sensitive issues such as family planning choices). Third, the research was carried out within one ward in Homabay County, and this might not have broad implications on other areas, where the socio-cultural and economic backgrounds are different. Lastly, although the sample size was sufficient to be used in both the descriptive and inferential analysis, the possibility of confounding variables like access to healthcare facilities, spouse influence, and previous contraceptive counselling was not completely controlled thus might have contributed to the reported use of BTL.

CONCLUSION

This study demonstrated that knowledge, attitudes, and perceptions influence utilization of BTL among married women of reproductive age. Given that a significant proportion of women of reproductive age would like to stop bearing children after attaining the desired family size, BTL offers a safe and effective family planning method for them. However, knowledge, attitude, and perceptions influence the uptake and use of BTL among women of reproductive age in African settings. Findings from a cross-sectional study conducted among 399 women in Kasgunga Ward, Homabay County, established that knowledge, attitudes and perceptions influence the utilization of BTL among married women of reproductive age. Specifically, findings indicated that culture and religion were the key factors that had negative effects on the perception of use of BTL among married women, irrespective of approvals from their husbands. Moreover, findings showed that married women with higher levels of education, greater income levels, and high number of children were likely to seek BTL services. Therefore, this study recommends reproductive health education to strengthen awareness among women, men, families, and religious leaders to enhance uptake of BTL. Other recommendations are socio-economic empowerment of women and the provision of affordable reproductive healthcare services for women to access and utilize.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Kibet PJ, Okeyo JA. Knowledge, attitudes and perceptions towards utilization of bilateral tubal ligation among married women of reproductive age (15-49 years) in Kasgunga ward, Homabay county, Kenya. Int J Reprod Contracept Obstet Gynecol 2025;14:4083-9.