Bilateral Tubal Ligation in Southeast Nigeria: Indications and Uptake Trends Over Five Years

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ABSTRACT

Background: Bilateral tubal ligation (BTL) is a highly effective and permanent method of contraception with a failure rate of less than 1%. Despite its safety and effectiveness, uptake remains low in many parts of sub-Saharan Africa, including Nigeria. This study assessed the uptake, indications, and clinical characteristics of BTL in a tertiary health institution in Southeast Nigeria.

Methods: This was a five-year retrospective descriptive study conducted at Enugu State University Teaching Hospital (ESUTH), Enugu, Nigeria. Records of all women who underwent BTL during the study period were reviewed. Data on socio-demographic characteristics, type of procedure, associated surgical interventions, indications; previous awareness and uptake of contraception, and complications were extracted and analyzed using descriptive statistics and chi-square tests, with statistical significance set at $p < 0.05$.

Results: A total of 38 women underwent BTL during the study period. The majority were aged 20–29 years (42.11%) and above 35 years (36.84%), with 76.32% being grand multiparous (>5 children). Most participants resided in urban areas (76.32%) and 39.47% had tertiary education. The Modified Pomeroy technique was the predominant method (71.05%), significantly more than the Pomeroy method (28.95%) ($\chi^2 = 6.73$, $p = 0.009$). Although 68.42% of respondents were aware of other contraceptive methods, only 7.89% had previously used any form of contraception ($\chi^2 = 26.94$, $p = 0.001$). Most procedures (76.32%) were performed for obstetric indications, particularly ruptured uterus, while only 23.68% were done purely for contraceptive purposes. No complications were recorded.

Conclusion: The uptake of bilateral tubal ligation in this tertiary institution was low and predominantly associated with obstetric indications rather than voluntary contraceptive intent. Despite moderate awareness of contraception, prior usage was minimal, suggesting persistent sociocultural and informational barriers. Strengthening antenatal counseling, improving male partner involvement, and enhancing access to interval sterilization services may improve voluntary uptake.

Keywords: Bilateral tubal ligation, permanent contraception, uptake, obstetric indications, Southeast Nigeria.

INTRODUCTION

Bilateral tubal ligation (BTL) is a permanent method of contraception involving surgical occlusion of the fallopian tubes to prevent fertilization. It is regarded as one of the most effective contraceptive methods globally, with a failure rate of less than 1% when properly performed.[1] The World Health Organization recognizes female sterilization as a safe and appropriate option for women who have completed their desired family size. [2]

Globally, female sterilization remains one of the most widely used contraceptive methods.[3] However, uptake varies considerably by region, with sub-Saharan Africa demonstrating significantly lower utilization compared to Asia and Latin America.[4]

In Nigeria, female sterilization contributes only a small proportion to the national contraceptive method mix. The Nigeria Demographic and Health Survey (NDHS) 2018 reported that female sterilization accounts for less than 2% of contraceptive use among married women.[5] This low national prevalence reflects broader sociocultural and health system challenges influencing permanent contraceptive uptake.

One of the earliest documented contraceptive reviews in Enugu was conducted at the University of Nigeria Teaching Hospital (UNTH), where a five-year review (1993–1997) showed that BTL constituted approximately 8% of contraceptive choices among new acceptors.[6] Although this proportion was higher than national averages, it remained significantly lower than uptake of intrauterine devices (IUDs) and injectables.

Subsequent trend analyses in tertiary hospitals in Southeast Nigeria showed that BTL remained among the least utilized methods compared to implants and IUDs.[7] A contraceptive trend analysis involving teaching hospitals reported that permanent methods consistently lagged behind reversible methods in uptake over time.[8]

A ten-year review in Southeast Nigeria described BTL as a "disappearing practice," reporting uptake below 1% in later years of the review period.[9] These findings suggest a downward or persistently low pattern of uptake in the region.

A six-year review at the University of Calabar Teaching Hospital reported that BTL accounted for only 1.08% of total deliveries, and most procedures were performed during cesarean sections rather than as interval sterilization.[10] Similarly, a four-year review at Alex Ekwueme Federal University Teaching Hospital, Abakaliki documented that only 2.1% of contraceptive acceptors chose BTL.[11]

In Rivers State University Teaching Hospital, a five-year review also showed low uptake of BTL relative to other contraceptive methods.[12] Studies in Uyo Teaching Hospital similarly demonstrated low acceptance of permanent contraception compared to long-acting reversible contraceptives (LARCs).[13]

These findings across multiple tertiary centers in Nigeria indicate that BTL remains a minority choice among contraceptive options.

A systematic review of barriers and facilitators to permanent contraception in sub-Saharan Africa identified sociocultural norms, myths, fear of regret, and religious beliefs as major barriers to uptake. [4] Studies conducted in Northern Nigeria demonstrated that although awareness of BTL was moderate to high, acceptability remained poor due to cultural and religious concerns.[14]

Research among antenatal clinic attendees in Ibadan also found low acceptability of BTL, with fear of irreversible infertility and potential regret being prominent concerns.[15]

Partner involvement plays a critical role in contraceptive decision-making in Nigeria. A study examining willingness to use female permanent contraception reported that male partner approval significantly influenced acceptance.[16] Another study conducted in Osogbo demonstrated that partner support was the strongest predictor of willingness to undergo BTL.[17]

These findings are consistent with broader literature demonstrating the influence of male decision-making authority in reproductive health matters in Nigeria.[18]

Organizational and service-delivery constraints also limit BTL uptake. Many tertiary institutions primarily perform BTL during cesarean section or immediate postpartum periods, limiting access to interval sterilization.[10] Limited trained personnel and inconsistent availability of services further reduce uptake.[9]

Studies examining contraceptive knowledge and practice in Enugu State University Teaching Hospital (ESUTH) showed that education level, method awareness, and counseling quality significantly influence contraceptive choice.[19] These determinants are likely to affect BTL uptake as well.

Additional research on barriers to family planning services in Enugu identified cost, misinformation, and limited male involvement as contributing factors to low uptake of certain methods.[20]

Recent trends in Nigeria show increasing uptake of implants and IUDs relative to permanent contraception.[7, 13] National fertility and contraceptive prevalence analyses confirm a shift toward reversible long-acting methods.[21]

Globally, similar trends have been observed, with women preferring reversible methods that offer flexibility despite having completed family size.[22] Counseling quality and provider bias have been identified as important factors influencing method choice.[23-25]

Although no indexed five-year retrospective study has specifically quantified BTL uptake at ESUTH, regional evidence from Enugu and comparable tertiary institutions suggests that:

BTL likely constitutes a small proportion of total contraceptive uptake.[6–9]

Most procedures are likely performed during cesarean sections rather than as interval sterilization.[10] Sociocultural, partner-related, and service-delivery factors likely influence uptake patterns.[4, 16, 20]

Improving uptake at ESUTH may require strengthened antenatal counseling, enhanced male partner engagement, improved access to interval sterilization services, and myth-dispelling community education.

CONCLUSION

The literature demonstrates consistently low uptake of bilateral tubal ligation in tertiary hospitals across Nigeria, including Southeast Nigeria. Despite its safety and effectiveness, BTL remains underutilized due to sociocultural barriers, partner influence, limited service accessibility, and preference for reversible methods. Evidence from Enugu and similar tertiary settings suggests that ESUTH likely experiences similar trends over a five-year period. There remains a need for institution-specific retrospective studies to generate accurate service data for planning and policy development.

METHODOLOGY

Study Design

This study was a retrospective descriptive cross-sectional study conducted to assess the uptake, indications, and clinical characteristics of bilateral tubal ligation (BTL) in a tertiary health institution.

Study Setting

The study was conducted at Enugu State University Teaching Hospital (ESUTH), Enugu, Nigeria, a tertiary referral center serving Enugu State and neighboring states in Southeast Nigeria. The hospital provides comprehensive obstetric and gynecological services, including family planning and sterilization procedures.

Study Duration

The study covered a five-year period, January 2021 – December 2025. Data collection was conducted over a defined review period following ethical approval.

Study Population

The study population comprised all women who underwent bilateral tubal ligation (BTL) at ESUTH during the study period.

Inclusion Criteria

All women who had BTL performed within the study period

Women whose medical records were complete and accessible

Both primary (interval or caesarean-related) and secondary (associated with other surgical procedures) BTL cases

Exclusion Criteria

Incomplete or missing medical records

Patients who underwent unilateral tubal ligation

Cases performed outside the defined study period

Sample Size

A total of 38 cases of bilateral tubal ligation were identified and met the inclusion criteria during the study period.

Data Collection

Data were obtained from: Theatre registers, family planning clinic records

Patient case files, Labour ward and operating room register

A structured data extraction form was used to collect the following variables:

Socio-demographic characteristics (age, parity, education, occupation, residence),

type of BTL technique (Pomeroy, Modified Pomeroy),associated surgical procedures, indications for BTL, previous awareness and uptake of other contraceptive methods, complications (intraoperative or postoperative)

Data Analysis

Data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 25

Descriptive statistics were used to summarize frequencies and percentages.

Chi-square (χ^2) test was used to assess associations between categorical variables.

A p-value of < 0.05 was considered statistically significant.

Results were presented in tables and percentages.

RESULT

Table1. Socio-Demographic and Baseline Characteristics

Variable	Frequency	Percentages (%)
Age (in years)		
<20 years	0	0.00
20-29 years	16	42.11

30-34 years	8	21.05
≥35	14	36.84
Parity		
1	1	2.63
2-4	8	21.05
≥5	29	76.32
Educational level		
No formal education	7	18.42
Primary education	8	21.05
Secondary education	8	21.05
Tertiary education	15	39.47
Occupation		
Teacher	16	42.11
Famer	7	18.42
Trader	12	31.58
House wife	3	7.89
Residence		
Urban	29	76.32
Rural	9	23.68

Socio-Demographic and Baseline Characteristics as presented in table 1 above showed that, a total of 38 respondents were studied. Most participants were aged 20–29 years (42.11%), followed by those >35 years (36.84%), while none were below 20 years.

The majority had high parity (>5 children) (76.32%), with only 2.63% having one child.

Regarding education, most respondents had tertiary education (39.47%), while 18.42% had no formal education.

In terms of occupation, teachers constituted the largest group (42.11%), followed by traders (31.58%), farmers (18.42%), and housewives (7.89%).

Most participants resided in urban areas (76.32%), compared to 23.68% from rural areas

Table 2. Methods of Bilateral Tubal Ligation

Variable	**Frequency**	**Percentages (%)**	**X^2 (p value)**
POMEROY	11	28.95	6.73 (0.009) *
MODIFIED POMEROY	27	71.05	

The Modified Pomeroy method was the most commonly used technique (71.05%), while the Pomeroy method accounted for 28.95% of cases.

There was a statistically significant association between the methods used ($\chi^2 = 6.73$, $p = 0.009$) as seen in table 2

Table3. Previous Awareness/Uptake of other contraceptive options

Variable	**Frequency**	**Percentages (%)**	**X^2 (p value)**
Previous awareness			
Yes	26	68.42	5.16 (0.023) *
No	12	31.58	
Previous uptake			
Yes	3	7.89	26.94 (0.001) *
No	35	92.11	

Most respondents (68.42%) had previous awareness of other contraceptive methods, and this was statistically significant ($\chi^2 = 5.16$, $p = 0.023$). However, only 7.89% had previously used other contraceptive methods, while 92.11% had not. This difference was highly statistically significant ($\chi^2 = 26.94$, $p = 0.001$) as presented in table 3

Table 4. Associated procedures

Variable	**Frequency**	**Percentages (%)**	**X^2 (p value)**
BLT as primary			
Caesarean section	11	28.95	6.73 (0.009) *
None	27	71.05	
BTL not primary			
EX LAP+ RU	33	86.84	20.63 (0.001) *
EX LAP +RU +RB	5	13.16	

For BTL performed as a primary procedure, 71.05% had no additional procedure, while 28.95% were done during caesarean section, showing statistical significance ($\chi^2 = 6.73$, $p = 0.009$).

When BTL was not the primary procedure, the majority (86.84%) were associated with exploratory laparotomy with repair of uterus (EX LAP + RU), and 13.16% had additional bladder repair (EX LAP + RU + RB). This was also statistically significant ($\chi^2 = 20.63$, $p = 0.001$).

Table 5. Indications and complications of BTL

Variable	**Frequency**	**Percentages (%)**
Indications		
Contraceptive	9	23.68

Obstetrics (ruptured uterus)	29	76.32
Complications		
None	38	100

The main indication for BTL was obstetric reasons (ruptured uterus) (76.32%), while 23.68% were done purely for contraceptive purposes.

No complications were recorded in any of the cases (100%).

DISCUSSION

This study examined the uptake and clinical context of bilateral tubal ligation (BTL) in a tertiary health setting. The findings provide important insights into the socio-demographic characteristics of acceptors, procedural patterns, awareness and prior contraceptive experience, as well as indications and outcomes.

The majority of women who underwent BTL were aged 20–29 years (42.11%) and above 35 years (36.84%), with no acceptors below 20 years. Most were grand-multiparous (>5 children) (76.32%), predominantly urban residents (76.32%), and a significant proportion had tertiary education (39.47%).

These findings are consistent with previous Nigerian studies which demonstrate that BTL is more common among older, high-parity women who have completed their desired family size. Edu et al. reported a predominance of multiparous women with mean parity ≥4 among BTL acceptors in Calabar.[26] Similarly, Wekere et al. observed that most women undergoing sterilization in Rivers State were multiparous and in their third or fourth decade of life.[27] Higher educational attainment observed in our cohort may reflect better access to reproductive health information and services, as also reported in previous Nigerian studies.[27, 28]

The Modified Pomeroy technique was the most frequently used method (71.05%) compared with the Pomeroy method (28.95%), with a statistically significant association ($p = 0.009$). This aligns with findings from Calabar and other Nigerian tertiary centres, where the Modified Pomeroy method remains the preferred technique because of its simplicity, safety profile, and suitability during caesarean section.[26]

Furthermore, most BTLs in this study were not primary procedures but were performed alongside other surgical interventions, particularly exploratory laparotomy with uterine repair (86.84%). Similar trends have been documented, with sterilization frequently carried out opportunistically during caesarean delivery or obstetric surgery rather than as an interval elective procedure.[26, 27] This reflects the generally low rate of voluntary interval BTL uptake in sub-Saharan Africa.

Although 68.42% of respondents were aware of other contraceptive options, only 7.89% had previously used any method. The significant gap between awareness and uptake highlights persistent barriers to contraceptive utilization.

Yakubu et al. reported that while over 70% of antenatal attendees in Sokoto were aware of BTL, acceptability remained low due to religious and cultural concerns. Similarly, a study in Ibadan found limited awareness and low willingness to adopt BTL despite completed family size, largely due to fear of regret and misconceptions.[28] In Kenya, Kibet and Okeyo also demonstrated that knowledge did not necessarily translate into utilization because of sociocultural influences and spousal disapproval.

A systematic review on permanent contraception in sub-Saharan Africa identified barriers such as fear of surgery, irreversibility, male partner influence, and cultural preference for large families as major deterrents. Our findings corroborate this evidence, suggesting that awareness alone is insufficient to drive uptake without targeted counseling and community engagement.

In this study, most BTLs (76.32%) were performed for obstetric indications, particularly ruptured uterus rather than purely for contraception (23.68%). This pattern supports previous Nigerian findings where sterilization is commonly performed for medical or obstetric necessity rather than voluntary contraceptive intent.[26, 27]

Importantly, no complications were recorded in our cohort (100%). This aligns with established literature demonstrating that BTL, particularly via the Modified Pomeroy technique, is a safe and effective permanent contraceptive method when performed by trained providers. [26, 27]

The predominance of grand-multiparous women undergoing BTL primarily for obstetric indications indicates missed opportunities for earlier contraceptive counseling and voluntary uptake. Strengthening antenatal and postpartum family planning counseling, involving male partners, and addressing cultural misconceptions may enhance acceptance.

Consistent with prior African studies. [29-31], multifaceted interventions, including community education, provider training, and policy support are required to bridge the gap between awareness and utilization.

CONCLUSION

The uptake of bilateral tubal ligation in this study was largely among high-parity, urban women and was predominantly performed for obstetric indications using the Modified Pomeroy technique. Despite moderate awareness of contraception, prior use was very low, reflecting persistent sociocultural and informational barriers. The absence of complications underscores the safety of the procedure. Efforts to improve voluntary uptake should focus on comprehensive counseling, male partner engagement, and community-based education strategies.

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Disclosure of conflict of interest

The authors declare no conflict of interests

Ethical approval

Approval of the ethics committee was obtained. Patient confidentiality was maintained by anonymizing data and no patient identifiers were included in the study.

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