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Women's (15-49 years) choices, challenges and everyday realities in dual protection utilization, a cross-sectional study at Mbale Regional Referral Hospital

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Abstract

Background

Dual protection, defined as the use of condoms together with an effective contraceptive method, provides protection against both unintended pregnancy and sexually transmitted infections (STIs), including HIV. Despite the availability of modern contraceptive methods, the use of dual protection remains suboptimal among women of reproductive age. Evidence on knowledge, attitudes, perceptions, and utilization of dual protection among women accessing family planning services in Eastern Uganda is limited. This study assessed knowledge, attitudes, perceptions, and factors associated with dual protection utilization among women aged 15–49 years accessing modern contraceptive services at Mbale Regional Referral Hospital, Eastern Uganda.

Methods

A descriptive cross-sectional study was conducted among women aged 15–49 years attending the family planning clinic at Mbale Regional Referral Hospital. A sample of 312 participants was determined using the Kish-Leslie formula, and participants were recruited using consecutive sampling. Data were collected using a structured questionnaire and analyzed using Stata version 15. Descriptive statistics were used to summarize participants' characteristics and levels of knowledge, attitudes, perceptions, and dual protection utilization. Associations between independent variables and dual protection utilization were assessed using chi-square tests and logistic regression. Statistical significance was assessed at $p < 0.05$.

Results

Of the 312 participants targeted, 311 were included in the reported analysis of age and outcome measures. Overall, 73.31% (n = 228) of participants had good knowledge of dual protection, while 62.70% (n = 195) had a positive attitude. However, 52.90% (n = 164) had poor perceptions regarding dual protection. More than half of the participants (53.05%, n = 165) reported that they had never used a condom in addition to their current modern contraceptive method. Among participants who reported never using dual protection, partner refusal (45.83%, n = 77), fear of side effects from using two methods (28.57%, n = 48), and reduced sexual pleasure (19.05%, n = 32) were the most frequently reported reasons. In multivariable analysis, HIV testing history, awareness of dual protection, positive attitude towards dual protection, and number of sexual partners were associated with utilization. Women who had never tested for HIV, had never heard of dual protection, or had two sexual partners had lower odds of dual protection utilization, while women with a positive attitude had higher odds of utilization.

Conclusion

Although most participants demonstrated good knowledge and positive attitudes towards dual protection, reported utilization was low and perceptions were frequently unfavorable. Partner-related barriers, concerns about side effects and sexual pleasure, and limited provider discussion of condom use may contribute to low utilization. Integrating dual protection counselling into family planning and HIV services, together with strengthening condom negotiation and partner communication, may help address these barriers.

Introduction

Dual protection is the simultaneously protection against both HIV/STIs and unwanted pregnancies(Feyisa et al., 2025). Dual protection involves consistent use of male or female condoms either alone or alongside a modern contraception method (Kumakech et al., 2025). Some of the modern contraception methods used alongside condoms are Depo Provera, implants, among others. (Kumakech et al., 2025).Using both condoms and modern contraception methods helps in preventing unintended pregnancies and prevention of sexually transmitted diseases(Amare et al., 2021). This is a WHO recommendation that is usually given a blind eye in daily practice especially if the intention is to address the double risks of HIV transmission and unintended pregnancy(Kumakech et al., 2025).Dual protection is a form of modern contraceptives(Jean Nepomuscene Renzaho & Erigene Rutayisire, 2022).

Globally, about 842million of 1.9 billion women used modern contraceptives in 2019 (Boadu, 2022) while in 2020, modern contraceptive use among women was at 23.9% (Boadu, 2022). In Africa, there is limited information on overall prevalence of women using modern contraceptives while in sub-Saharan Africa, 22.0% women used modern contraceptives (Boadu, 2022).In other parts of Sub-Saharan Africa, modern contraceptive use was unevenly distributed with 3.5% in the Central African Republic and 62% from Zimbabwe (Boadu, 2022). In Namibia, use of modern contraceptives was at 49.7%, with only 17.5% having used condoms (Boadu, 2022). In Uganda, the prevalence rate of modern contraceptives rose from 30.4% in 2020 to 39.6% in 2025 (Namasivayam et al., 2022) .

Globally15% to 20% women use dual protection as a form of modern family planning(WHO, 2025). In Africa, dual protection utilization is at less than 15% among women (Jean Nepomuscene Renzaho & Erigene Rutayisire, 2022). In Sub-Saharan Africa, there is no overall estimation of the prevalence of use of dual protection as a form of contraception; however, in Ethiopia, the prevalence was at 34.05% (Ayenew, 2022). In Rwanda, only 40% of women utilized dual protection as a form of family planning (Jean Nepomuscene Renzaho & Erigene Rutayisire, 2022). In Uganda, a study carried out in Rukungiri showed that only 9 out of 150 women used dual protection(Hodaka Kosugi, Akira Shibanuma, Junko Kiriya, Ken Ing Cherng Ong, et al., 2020).

Goal number 3 of the Sustainable Development Goals is aimed at ensuring universal access to sexual and reproductive health care services, which does not exclude dual protection as a form of family planning(Scanlon et al., 2022). The use of dual protection is aimed at preventing unintended pregnancies and sexually transmitted diseases(Amare et al., 2021). To achieve the 2030 number 3 agenda of

sustainable development goals of zero HIV, collective efforts should be put on advocating for the utilization of dual protection as a form of family planning(Scanlon et al., 2022).

Studies show that many women using contraceptives as a form of family planning have reduced rates of unwanted pregnancies, but high rates of HIV among them (Hodaka Kosugi, Akira Shibanuma, Junko Kiriya, Ken Ing Cherng Ong, et al., 2020).

Some of the drivers of high incidences of sexually transmitted diseases among women using family planning are incorrect use of dual protection and extramarital affairs (Kumakech et al., 2025).This has resulted in unwanted pregnancies, unsafe abortions, and psychological torture as a result of social stigma for those who acquire HIV (Amare et al., 2021).To address the double risks of HIV transmission and unintended pregnancies, WHO recommends the use of dual protection methods (Kumakech et al., 2025). In Uganda, previous studies have focused on the prevalence and factors associated with dual contraceptive methods, but many have used small samples limited to adolescent girls and women aged 15-24 years(Kumakech et al., 2025).

This limits the generalizability of their findings. Uganda's health system also emphasizes family planning without adequately elaborating on dual protection as a form of family planning(Kumakech et al., 2025). In Eastern Uganda, there is limited evidence on the use of dual protection utilization among women aged 15-49 years. (Kosugi et al., 2021). As a result, knowledge, attitudes, and perceptions regarding dual protection utilization are limited among this age group. Therefore, this study is aimed at assessing knowledge, attitudes, and perceptions regarding dual protection utilization among women aged 15-49 years accessing modern contraceptives at Mbale Regional Referral Hospital in Mbale City, Eastern Uganda.

Materials and methods

Study design and setting: This was a descriptive crossectional study design. This is because it operated in a defined population at a specific time without attempting to draw any inference.

This study took place at Mbale Regional Referral Hospital family planning clinic which is found in Mbale City, Eastern Uganda. Mbale Regional Referral Hospital serves several districts with in Eastern Uganda. These districts are: Mbale, Bukwo, Bukedea, Kumi, Kween, Kibuku, Kapchorwa, Busia, Budaka, Butaleja, Manafwa, Pallisa, Tororo and Sironko.

Mbale Regional Referral Hospital a tertiary teaching hospital. The services delivered at Mbale Regional Referral Hospital are both inpatient and outpatient services with a bed capacity of around 400 beds (Chemutai et al., 2020). In the facility, there are family planning services offered to various clients of about 130 clients on average in a month. Among these clients mostly include those women of age 15 to 49 years.

Mbale Regional Referral Hospital is a public hospital fully funded by Uganda Ministry of Health and it is among the thirteen (13) regional referrals in Uganda. It is also a teaching hospital for Busitema University Faculty of Health Sciences, Mbale Campus (Chemutai et al., 2020).This study was favorable in this setting because the referral hospital consumed a high load of FP,HIV and STIs clients, and adolescent reproductive services

Study population and sampling: This study targeted women of 15 to 49 years accessing modern contraceptives in Mbale Regional Referral Hospital. These populations often visited the family planning clinic of Mbale Regional Referral for family planning health care services but those who took dual protection services were at a low rate. Consecutive sampling was used to recruit participants for the study with only women of 15 to 49 years accessing modern contraceptives at Mbale Regional Referral Hospital recruited.

Eligibility criteria: Only women of 15 to 49 years who accessed modern contraceptives and consented to participate in the study were included in the study. Women that were tested and found pregnant at the time of the interview plus those critically ill were excluded from the study.

Sample size determination: Using the Kish Leslie formula for sample size determination, the sample size for quantitative study was calculated as follows (Kumakech et al., 2025).

N=P(1-P) Z^2/d^2.

Were, N was the sample population,

P was the estimated population proportion,

q= 1-P was the population proportion; Z is the Z-score was 1.96 of 95% confidence interval,

And d was the margin of error; 5% for 95% confidence interval

And therefore, the study about dual protection utilization and associated factors among women living with human deficiency virus at Kawempe National Referral Hospital was used as a reference study (Nambasa, 2022).

Only 24.4% of these women utilized dual protection (Nambasa, 2022). Therefore, the sample size **was calculated as follows;**

N=P(1-P) Z^2/d^2

Where; N=sample size; P= estimated population proportion; Z=confidence interval; d=margin of error

So, replacing;

N=0.244(1-0.244)1.96^2/0.05^2

N=283.45

10% of 283.45 =28.345

283.45+28.345=311.795

N=311.794

Which after rounding off became 312 participants and therefore the study sample size was 312 participants. Each day a maximum of 12 participants who consented was able to participate in the study.

Study variables: The independent included social demographic characteristics like age, marital status, education level, and health system factors, sexual/reproductive history, and partner related factors. The dependent variables included Knowledge, attitudes, and perceptions on dual protection utilization where the primary outcome was dual protection utilization.

Data collection method: Respective clients were approached by the researcher during their regular visits to the family planning clinic, after which self-introduction and creating rapport were followed. The study was explained to them, and their consent was also requested for. The consent form was also in the Luganda version for easy understanding. After the participants signed the consent forms, data was then collected using questionnaires with open and close ended questions on knowledge, attitudes, and perception on dual protection utilization. Data was collected using questionnaires, which were developed by the principal investigator under guidance.

Data analysis: Stata Version 15 was used to analyze the data, which was later presented by the researcher in the form of tables and with descriptive statistics. Knowledge was grouped into poor knowledge and good knowledge, were a woman who got below 60% had poor knowledge and those above 60% had good knowledge ,following some studies like (Sitonga et al., 2023). Attitudes were awarded according to overall mean scores, which were 3.0, above the mean score, it was positive attitudes and below the mean score, it was poor attitudes towards dual protection(Simegn et al., 2024). Whoever was not interested in utilizing dual protection with reasons was awarded poor perceptions and those who had ever used it with benefits were awarded with good perceptions(Calhoun et al., 2022). Inferential statistics was used at univariate levels and other levels to test hypotheses and determine the relationships and associations between variables. The bi-variant variables were further analyzed using the chi-square test and P-values of $P<0.05$ to get the statistically significant values. Later, multivariable variables were also analyzed using logistic regression to get more significant variables for the conclusion that is to say $P<0.2$. The Hosmer-Lemeshow test model was used to evaluate the calibration of binary logistic regression models. Multicollinearity was done where independent variables in a regression model were correlated. Furthermore, a variance Inflation factor was done to detect and measure the severity of multicollinearity.

Ethical approval: The study protocol was submitted to the Busitema University Faculty of Health Sciences Research Ethics Committee for ethical review and approval. Ethical clearance was granted under REC number BUFHS-2026-660 on 27 March 2027. The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants prior to their participation in the study.

Confidentiality and privacy were maintained throughout the study. Participants' personal information was securely protected, and anonymity was ensured during data collection, analysis, and reporting. Participants were informed of their right to withdraw from the study at any time without any consequences. Sensitive questions regarding sexual behaviour were carefully explained to participants to minimize potential discomfort or distress. Participants were also given adequate time to reflect before responding, and appropriate support was provided if any participant experienced discomfort or distress during the interview.

Results

A total of 312 participants were enrolled in the study, although 311 observations are reported for some analyses. Participants had a mean age of 29.2 ± 7.0 years, with ages ranging from 16 to 49 years. Nearly half (49.52%) were aged 25–34 years, 75.56% were married, and 46.30% had attained secondary education.

Most participants (97.43%) reported previous use of a contraceptive method. Injectables were the most commonly reported modern contraceptive method (35.64%), followed by Implanon (20.46%). Nearly all participants (92.93%) had previously tested for HIV or an STI, and 77.49% had previously heard of dual protection.

Overall, 73.31% (n=228) of participants were classified as having good knowledge of dual protection, while 26.69% (n=83) had poor knowledge. Positive attitudes towards dual protection were reported among 62.70% (n=195) of participants, whereas 37.30% (n=116) had negative attitudes. Perceptions were less favorable: 47.10% (n=146) had good perceptions and 52.90% (n=164) had poor perceptions.

Reported utilization of dual protection was relatively low. More than half of participants (53.05%, n=165) reported never using a condom in addition to their current modern contraceptive method. Similarly, 54.02% (n=168) reported that they had never used a condom during every act of sexual intercourse in the preceding three months. Among participants who reported not using dual protection, the most frequently reported reasons were partner refusal (45.83%, n=77), fear of side effects from using two methods (28.57%, n=48), and reduced sexual pleasure (19.05%, n=32). In addition, 52.73% (n=164) reported that a healthcare provider had not discussed condom use with them during their most recent family planning visit.

In the multivariable analysis, several factors were statistically associated with reported dual protection utilization. Participants who had never tested for HIV had lower odds of reported utilization than those

who had tested (AOR=0.004, 95% CI: 0.00006–0.23; *p*=0.008). Participants who had never heard of dual protection also had lower odds of reported utilization (AOR=0.0008, 95% CI: 0.00002–0.013; *p*<0.001). Positive attitude towards dual protection was associated with higher odds of utilization (AOR=214.41, 95% CI: 3.08–906.8; *p*=0.013). The number of sexual partners was also associated with utilization; participants reporting two sexual partners had lower odds compared with those reporting one partner (AOR=0.59, 95% CI: 0.01–0.67; *p*=0.022). These estimates should be interpreted cautiously because some confidence intervals were very wide, indicating substantial statistical uncertainty.

Table 1: Continuous age distribution of respondents

The respondents had a **mean age of 29.2 ± 7.0 years**, with ages ranging from **16 to 49 years**, reflecting the study's target population of women of reproductive age (15–49 years**) (Table 1).**

Variable	observations	Mean	Std dev	min	Max
Age	311	29.22508	7.033158	16	49

Table 2: Social demographic characteristics

Nearly half of the respondents, 49.5%, were aged 25-34 years, followed by those aged 15-24 years (28.3%), while only 4.2% were aged 45-49 years **(Table 2).** Most participants were married (75.6%), with separated women comprising the smallest group (2.9%) **(Table 2).** Regarding education, 46.3% had attained secondary education, whereas only 5.8% had no formal education **(Table 2).**

Variable	Category	Frequency(n)	Percentage
Age group	15-24	88	28.30
	25-34	154	49.52
	35-44	56	18.01
	45-49	13	4.18
Marital status	Single	67	21.51
	Married	235	75.56
	Separated	9	2.89
Education level	Primary	69	22.19
	Secondary	144	46.30
	Tertiary	80	25.72
	Uneducated	18	5.79

Table 3: General demographic and contraceptive use characteristics

Almost all respondents (97.4%) had used contraceptives, with injectables (35.6%) being the most commonly used method, followed by implants (20.5%) **(Table 3).** Condom use was reported by 15.5% of the participants (**Table 3).** The majority (92.9%) had previously tested for HIV /STIs, 86.8% had one sexual partner, and 77.5% had heard of dual protection, while 22.5% were unfamiliar with the concept (**Table 3).**

Variable	Category	Frequency(n)	Percentage
Ever used any contraceptive	Yes	303	97.43
	No	8	2.57
Modern contraceptives being used	Intra-Uterine Devices	28	9.24
	Pills	34	11.22
	Implanons	62	20.46
	Jadelle	23	7.59
	Injectables	108	35.64
	Condoms	48	15.84
	Spermicides	0	0
Ever tested for HIV or any STIs	Yes	289	92.93
	No	22	7.07
Number of sexual partners	1	269	86.77
	2	29	9.35
	3 and above	2	0.65
	None	10	3.23
Ever heard of the dual protection method	Yes	241	77.49
	No	70	22.51

Table 4: Knowledge of dual protection

Knowledge of dual protection was generally moderate to good among respondents **(Table 4)**. Most women (81.99%) used family planning mainly to prevent pregnancy, while only 12.54% recognized its role

in preventing both pregnancy and STIs **(Table 4).** About 62.06% preferred male condoms for dual protection, and 14.47% mentioned using both male and female condoms **(Table 4).** Overall, 71.70% identified dual protection as the use of two methods simultaneously, although 27.02% lacked this understanding **(Table 4).** Among non-condom users, 73.31% believed their current method did not protect against both pregnancy and STIs, while only 15.76% of condom users believed it did. Information on dual protection was most commonly received at health facilities (33.76%) **(Table 4).**

Variable	Category	Frequency(n)	Percentage
Reason for your using the current modern contraceptive method	To prevent pregnancy	255	81.99
	To prevent HIV and other STIs	3	0.96
	To prevent both pregnancy and STIs	39	12.54
	None of the above	14	4.50
Would you use together with your current modern contraceptive to prevent both pregnancy and STIs	Male condom	193	62.06
	Female condom	0	0
	Both male condom and female condom	45	14.47
	Withdraw	13	4.18
	IUD	6	1.93
	Implanon	2	0.64
	None of the above	52	16.72
Dual protection is achieved by simultaneously using two methods one for pregnancy prevention and the other for STIs prevention	True	223	71.70
	False	4	1.29
	I do not know	84	27.01
The current method you are using prevents you from getting pregnant and protects you against getting STIs	True	49	15.76
	False	228	73.31
	I do not know	34	10.93
Where did you first hear about the idea of using two methods or condoms only to protect against both STIs and pregnancy?	Health facility	105	33.76
	Clinic	23	7.40
	Staff	8	2.57
	Friends	88	28.30
	Media	17	5.47
	None of the above	70	22.51

Table 5: Attitude on dual protection.

Overall, women demonstrated positive attitudes towards dual protection **(Table 5).** About 34.4% strongly agreed that using dual protection was easy,44.4% strongly agreed it was important for women regardless of whether they had single or multiple partners, and 32.3% strongly agreed that they were confident in using condoms with their partners **(Table 5).** More than half (52.1%) strongly believed that dual protection reduces anxiety about both STIs and unintended pregnancy **(Table 5).** However, 34.4% strongly disagreed that their partners supported condom use, highlighting partner support as a major barrier to dual protection utilisation **(Table 5).**

Variable	Category	Frequency(n)	Percentage
Using dual protection, e.g., (pill + condom) or condoms only, is too easy	Strongly disagree	44	14.15
	Disagree	29	9.32
	Neutral	79	25.40
	Agree	53	17.04
	Strongly agree	106	34.08
Dual protection is necessary for both women with multiple partners and those with one partner	Strongly disagree	57	18.33
	Disagree	26	8.36
	Neutral	29	9.32
	Agree	61	19.61
	Strongly agree	138	44.37
My partner supports the idea of using condoms in addition to my primary contraceptive method	Strongly disagree	107	34.41
	Disagree	39	12.54
	Neutral	13	4.18
	Agree	55	17.68
	Strongly agree	97	31.19
I would feel confident telling my partner to use a condom in addition to my primary contraceptive method	Strongly disagree	100	32.26
	Disagree	37	11.94
	Neutral	13	4.19
	Agree	59	19.03
	Strongly agree	101	32.58
I believe using dual protection reduces anxiety about getting an STI and pregnancy	Strongly disagree	27	8.68
	Disagree	15	4.82
	Neutral	50	16.08
	Agree	57	18.33

	Strongly Agree	162	52.09

Table 6: Perception and utilization of dual protection.

In this study, 53.05% (n=165) had never used a condom in addition to their modern contraceptive methods, and 54.02%(n=168) of the study population had never used a condom at all during sexual intercourse in the past three months (**Table 6**). Among those who had never used dual protection, the leading reasons were partner refusal with 45.83%(n=77), fear of side effects from combining two methods with 28.57%(n=48), and reduced sexual pleasure with 19.05%(n=32) (**Table 6).** In addition, 52.73%(n=164) of the women noted that their health care provider did not discuss condom use during their last visit to a family planning unit (**Table 6).**

Variable	Category	Frequency(n)	Percentage
How often do you use a condom in addition to your current modern contraceptive method	Always	13	4.18
	Most of the time	28	9.00
	Some times	38	12.22
	Rarely	67	21.54
	Never	165	53.05
In the past 3 months, how many times did you and your partner use a condom for every act of sexual intercourse	All the time	15	4.82
	Sometimes	52	16.72
	Rarely	76	24.44
	Never	168	54.02
If never, what are the main reasons you do not use dual protection	Partner refusal	77	45.83
	Reduced sexual pleasure	32	19.05
	Fear of side effects from the two methods	48	28.57
	Not available /not accessible	11	6.55
	None of the above	0	0
What are the main benefits of dual protection for you	Preventing pregnancy and STIs	228	73.31
	Increased sense of control	4	1.29
	Promotes communication with the partner	12	3.86
	None of the above	67	21.54
Did a health care provider at a clinic discuss the use of a condom with you during your last visit to a modern contraceptive	Yes	147	47.27
	No	164	52.73

Table 7: General knowledge performance

Knowledge was generally high, as 73.31%(n=228) of the study population possessed good overall knowledge of dual protection, and 26.69%(n=83) possessed poor knowledge of dual protection (**Table 7).**

Variable	Category	Frequency(n)	Percentage
Knowledge level	Good knowledge	228	73.31
	Poor knowledge	83	26.69

Table 8: General attitude performance

Attitudes were generally positive, as 62.70%(n=195) had a positive attitude towards dual protection, and the least number of women, with a percentage of 37.30%(n=116) had a negative attitude towards dual protection **(Table 8).**

Variable	Category	Frequency(n)	Percentage
Attitude level	Positive attitude	195	62.70
	Negative attitude	116	37.30

Table 9: General perception performance

Perception was largely poor, and utilization of dual protection was very low, with a percentage of 52.90% (n=164) (**Table 9**).

Variable	Category	Frequency(n)	Percentage
Perception level	Good perception	146	47.10
	Poor perception	164	52.90

In summary, although 71.7% of women were knowledgeable about dual protection, more than half (53.1%) never used it due to interpersonal relationship dynamics. While knowledge was associated with positive attitudes, actual use was hindered by partner-related barriers, including partner refusal (45.8%) and opposition to condom use alongside primary contraceptive methods (34.4%)

Table 10: Showing bivariate and multivariate logistic regression models to identify independent predictors of dual protection utilization.

After multivariable adjustment, social demographic characteristics such as age, marital status, and education were no longer significantly associated with dual protection utilization **(Table 10).** Among behavioral factors, the type of contraceptive used was not a significant predictor **(Table 10).** However, women who had never undergone HIV testing were less likely to use dual protection (AOR = 0.004, *P* = 0.008) (**Table 10).** Similarly, the number of sexual partners remained a significant predictor, with women reporting no sexual partner being less likely to utilize dual protection than those with one partner. AOR = 0.058, *P* = 0.022) **(Table 10).**

Variables	COR (95% CI)	P value	AOR (95% CI)	P-value
Age group				
15-24	Ref	-	Ref	-
25-34	1.25 (0.69 - 2.27)	0.453		
35-44	1.19 (0.56 - 2.55)	0.654		
45-49	.340 (0.10 1.11)	0.074		
Using any contraceptive				
Yes	**Ref**	Ref	Ref	Ref
No	**0.05(0.01 - 0.40)**	**0.005**	**-**	**-**
Ever tested for HIV				
Yes	Ref	-	Ref	-
No*	**0.14(0.056 -0 .37)**	**<0.001**	**0.004(0.00006 - 0.23)**	**0.008**
The number of sexual partners one has				
1	**Ref**	Ref	Ref	Ref
2*	**2.20(0.739 - 6.539)**	**0.15**	**0.0.59(0.01- 0.67)**	**0.022**
None	0.39 (0.0049 -0.314)	0.002	Ref	Ref
Ever heard about dual protection				
Yes	Ref	-	Ref	-
No*	**0.0020(0.0004-0.009)**	**<0.001**	**0.0008(0.00002 - 0.013)**	**0.000**
Attitude towards dual protection				
Positive attitude*	**223.33(52.47-50.54)**	**<0.001**	**214.41(3.08 -906.8)**	**0.013**
Negative attitude	Ref	-	Ref	-
Perception towards dual protection				
Negative attitude	Ref	-	Ref	-

Positive attitude	**70.3(16.8 - 293.2)**	**<0.001**	**0.90(0.03 - 26.56)**	**0.950**

Discussion

This study aimed to assess the knowledge, attitudes, and perceptions regarding dual protection utilisation among women (15-49 years) accessing modern contraceptives at Mbale Regional Referral Hospital. In this study, women had a very high level of knowledge about dual protection at 73%. This indicated that the women understood that dual protection involves using a condom together with another contraceptive method to prevent both pregnancy and STIs/HIV. Health facilities were the primary source of this information, highlighting the important role of healthcare services in promoting awareness of dual protection. These findings are similar to those from Rwanda, where awareness and knowledge of dual contraceptive methods were high among reproductive-age women (J. N. Renzaho & E. Rutayisire, 2022). The finding that health facilities were the major source of information is similar to a Ugandan study where family planning and HIV service points played a critical role in increasing women's awareness of dual-method (Hodaka Kosugi, Akira Shibanuma, Junko Kiriya, Ken I. Ong, et al., 2020).

Positive attitude towards dual protection among women was at 62.7%, with most women believing that dual protection is important regardless of the number of sexual partners. Many also agreed that dual protection reduces anxiety related to unintended pregnancy and STIs. These findings are similar to Ethiopia, where 65% of women living with HIV exhibit favourable attitudes towards family planning methods, which is slightly higher than the 62.7% observed in our study (Boke et al., 2024). These findings are similar to another Ethiopian study where 65.4% of participants had a positive attitude towards family planning and dual protection, which is very similar to the 62.7%in our study (Mebratu Mitiku Reta et al., 2019).

Despite having good knowledge and a positive attitude, the majority (52.9%) had poor perceptions towards dual protection, with 53,1% having never used condoms together with their current contraceptive method. This finding is consistent with studies from Ethiopia, where many women were aware of the benefits of dual protection but had low utilisation of I (Gebrehiwot et al., 2017; Tilahun et al., 2021). In Central Ethiopia, 73.4% of women had never used a condom in the six months preceding the study, similar to that reported in Northern Ethiopia, where only 15.7% of women consistently used dual contraceptive methods while partner refusal (44.3%) was a major barrier, as in our study (Gebrehiwot et al., 2017; Tilahun et al., 2021). .

After multivariate adjustments, four factors remained statistically significant predictors of dual protection utilisation. Women who had never undergone HIV testing were significantly less likely to use dual protection as compared to those who had tested (AOR = 0.004; 95% CI: 0.00006–0.23; p = 0.008). This shows that HIV testing triggers a sense of responsibility among women, which could mostly be due to pre- and post-HIV-testing counselling. This is similar to the findings of a study carried out in a systematic review in Ethiopia, where women who received post-test counseling were over four times more likely to use dual contraception (AOR = 4.38; 95% CI: 2.93–6.54)(Ayenew, 2022).

Awareness of dual protection where women who had never heard about dual protection were significantly less likely to use it (AOR = 0.0008; 95% CI: 0.00002–0.013; p < 0.001). This shows that a lack of knowledge greatly reduces the level of utilisation of dual protection. Similar findings have been reported in Ethiopia, where studies found that women with adequate knowledge of dual contraception were significantly more likely to use dual methods(Ayele et al., 2021; M. M. Reta et al., 2019)

Women with a positive attitude were more likely to use dual protection compared to those with a negative attitude (AOR = 214.41; 95% CI: 3.08–906.8; p = 0.013). Similar findings were reported in a Ugandan qualitative study where women who practiced dual methods had positive attitudes and favorable perceptions toward dual protection (Hodaka Kosugi, Akira Shibanuma, Junko Kiriya, Ken I. Ong, et al., 2020).

Women with two sexual partners were less likely to utilise dual protection compared to those with one partner (AOR = 0.59; 95% CI: 0.01–0.67; p = 0.022). This shows that a woman with more than one sexual partner usually has very poor and risky sexual practices as compared to a woman with one sexual partner. This finding is consistent with studies in Ethiopia, where relationship dynamics and partner-related factors significantly influenced dual contraceptive utilization among women living with HIV (Abay et al., 2020; Tilahun et al., 2021). Similarly, a systematic review in Ethiopia showed that communication with partners and partner support were important predictors of dual contraceptive use (Tilahun et al., 2021). Similar findings were found from a Ugandan study where women who successfully practiced dual-method use had better partner communication, greater risk perception regarding HIV/STIs, and stronger condom negotiation skills(H. Kosugi et al., 2020). Overall, dual protection utilisation was significantly influenced by HIV testing status, awareness, attitude, and number of sexual partners.

Study limitation: This study had some limitations. First, because the study was cross-sectional, data on possible factors and dual protection use were collected at the same time. Therefore, the study cannot establish cause-and-effect relationships.

Second, the study relied on participants' self-reported information about sexual behavior, condom use, number of sexual partners, and contraceptive use. Since these are sensitive topics, some participants may have given socially desirable responses or may not have accurately remembered past behaviors.

Third, the study was conducted at one regional referral hospital among women attending the family planning clinic. Therefore, the findings may not represent all women aged 15-49 years in Eastern Uganda or Uganda.

Fourth, consecutive sampling was used, which may have introduced selection bias because women attending the clinic during the study period may differ from those who did not attend.

Finally, some of the statistical estimates had wide confidence intervals, suggesting that the estimates may not be very precise. Therefore, the observed associations should be interpreted with caution.

Recommendation: Strengthening integrated HIV and family planning counselling and explaining HIV testing are very important to improve uptake and consistent use of dual protection.

Conclusion

In this study, most women attending the family planning clinic at Mbale Regional Referral Hospital had good knowledge of dual protection and generally positive attitudes towards its use. However, reported utilization was relatively low, and more than half of participants had poor perceptions of dual protection. Partner refusal, concerns about side effects, reduced sexual pleasure, and limited discussion of condom use by healthcare providers were commonly reported barriers.

HIV testing history, awareness of dual protection, attitude towards dual protection, and number of sexual partners were statistically associated with reported dual protection utilization in the multivariable analysis. However, because of the cross-sectional design and the limitations associated with self-reported and facility-based data, these relationships should be interpreted as associations rather than causal effects.

Integrating dual protection counselling into routine family planning and HIV services may provide an opportunity to address knowledge gaps, partner-related barriers, and condom negotiation challenges. Further research using longitudinal or population-based designs would be useful to clarify the temporal and causal relationships between these factors and dual protection utilization.

Declarations

Declaration of Competing Interest

The authors declare no competing interests.

Availability of data and materials.

All relevant data are within the paper and its Supporting Information files.

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Author's statement:

(NE)Nakawesa Elizabeth conceptualised the study and wrote the proposal; TR (Ronald Tweheyo), VM (Victor Mudimi), MS(Mwebembezi Stephen)DI (Denis Ituluntu) collected data; SM and MIN (Mildred Irene Mildred), EKK (Enid Kawala Kagoya) and RT analysed the data and drafted the manuscript. SO (Samuel Olowo), JE (Joshua Epuitai), and PWM (Praise Wendy Magombo) reviewed the manuscript. EKK, DK (Dan

Kibuule), and PW (Paul Waako) provided the overall oversight in the design and implementation of the study. All authors meet the criteria for author contributions and have read and approved the manuscript.

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