

Determinants of Dual Protection Use among Adolescent Girls: Evidence from Maroua Regional Hospital, Cameroon (2024)

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Abstract

Introduction: Dual contraceptive protection, combining a modern method and condoms, is a vital strategy to simultaneously decrease unintended pregnancies and sexually transmitted infections (STIs) among adolescent girls. However, its usage remains limited in sub-Saharan Africa. This study was to identify the factors influencing dual protection use among adolescent girls attending the Maroua Regional Hospital in 2024. **Methods:** A cross-sectional analytic study was conducted from November 2023 to August 2024. Of 103 adolescents enrolled, 12 were excluded, resulting in 91 eligible participants. Sixty were retained after age matching (30 single-contraception, 30 dual-contraception). Data were collected via structured interviews and questionnaires and analysed using multivariate logistic regression. **Results:** The frequency of dual protection use was 32.9% (30/91). In bivariate analysis, adolescents with prior STIs, past pregnancy, or those using pills/condoms were more likely to use dual protection. After adjustment, factors positively associated with dual protection included: having a previous pregnancy (aOR = 2.03; p = 0.044), using male condoms (aOR = 5.01; p = 0.003), and believing in the effectiveness of dual protection (aOR = 11.1; p = 0.011). A common barrier was early marriage (aOR = 0.14; p = 0.041). **Conclusion:** The adoption of dual protection is affected by social, clinical, and perceptual factors. Our findings underscore the

need to strengthen adolescent reproductive health programs by promoting dual protection and advancing efforts to end early marriage.

Keywords

Adolescent, Dual Protection, Contraception, STI, Cameroon

1. Introduction

The sexual and reproductive health of adolescent girls and young women remains a major public health issue, particularly in low- and middle-income countries. Each year, nearly 21 million girls aged 15 to 19 years become pregnant, the majority in resource-limited settings, exposing these young mothers to an increased risk of obstetric complications and maternal and neonatal mortality [1] [2]. At the same time, this population is particularly vulnerable to sexually transmitted infections (STIs), including HIV, which accounts for a significant proportion of new infections in sub-Saharan Africa [3].

Faced with this dual vulnerability, dual contraceptive protection, defined as the concomitant use of a modern contraceptive method and a condom, constitutes an effective strategy to prevent both unwanted pregnancies and STIs/HIV. However, its adoption remains limited in many sub-Saharan African countries, including Cameroon [4]. Several barriers hinder its use, ranging from individual obstacles (insufficient knowledge, low decision-making power) to sociocultural constraints (stigma, restrictive gender norms) and structural constraints (limited access to youth-friendly services) [5] [6].

In Cameroon, despite reproductive health policies and sexuality education programs, the proportion of adolescent girls with unmet need for family planning remains high, and teenage pregnancies persist [7]. In addition, adolescent girls and young women have a disproportionate prevalence of STIs, including HIV [3]. These trends highlight the importance of assessing factors associated with the adoption of dual contraceptive protection to guide better-targeted public health interventions.

Thus, the present study aims to study the determinants of the use of dual protection among adolescent girls at the Maroua Regional Hospital in 2024.

2. Methodology

2.1. Type and Period of Study

This study adopted a cross-sectional design to estimate the prevalence of dual protection use among adolescent girls. Subsequently, to identify factors associated with dual protection, a nested age-matched case-control study was conducted within the same population, comparing adolescents who reported using dual protection (cases) with those who did not (controls). This study was conducted over 10 months, from November 1st 2023, to August 31, 2024, at the Maroua Regional

Hospital, a 3rd category and 2nd referral level facility, serving as a referral center for several health facility and district hospitals in the Far North region of Cameroon.

2.2. Site and Population

The study was carried out in the different departments of the Maroua Regional hospital, with a particular focus on the Adolescent Reproductive Health Service (ARH), which receives an average of 90 adolescent girls per month and offers sexual and reproductive health services, including family planning and management of unwanted pregnancies.

The target population included all adolescent girls using modern contraceptive methods. The study population consisted of adolescent girls aged 15 to 19, using modern contraceptive methods and attending consultation at the Maroua Regional Hospital during the study period and meeting the inclusion criteria.

2.3. Criteria Inclusion

- Sexually active adolescent girls, having given their assent and benefited from parental consent, using modern contraceptive method and without contraindication to modern contraceptives.

2.4. Exclusion Criteria

- Any adolescent girl whose questionnaire was incomplete

2.5. Sampling

A consecutive non-probability sampling method was applied. All eligible adolescent girls attending consultation during the study period were invited to participate. The minimum sample size was calculated according to the Schlesselman formula, for comparing two proportions, with a two-sided significance level of 5% and a statistical power of 80%. We considered a proportion of adolescents using dual protection ($p_1 = 13.3\%$) [8], and a proportion of those using modern contraception ($p_2 = 48.7\%$). The minimum required sample size was 26 participants per group (52 in total). Allowing for a 10% non-response rate, the final sample size was set at 58 participants.

2.6. Data Collection

After obtaining ethical and administrative approvals, eligible adolescent girls were informed about the study and invited to participate. After obtaining parental consent and participant assent for those less than 18 years old, a structured pre-tested questionnaire was administered individually, in French or the local language.

The data collected included:

- **Sociodemographic characteristics:** age, level of education, occupation, religion, marital status, region of origin, and place of residence.
- **Economic and family data:** family type, guardian, and financial support.
- **Clinical data:** pregnancy, parity, history of pregnancies and STIs, complica-

tions.

- **Family planning education:** knowledge and use of family planning services, contraceptive methods known and used, use of dual protection and reasons for non-use.
- **Outcome variable:** Consistent dual protection use determined from responses to the questions “Do you practice dual protection?” and “What type of dual protection do you use?” Participants were considered consistent users if they reported using both a condom and another modern contraceptive method at every sexual encounter during the past 12 months.
- **Statistical analysis**

Data were entered into Excel and analyzed using Epi Info 7.2. Descriptive statistics were employed to summarize the characteristics of the sample and patterns of dual protection use. Associations between dual protection use and explanatory variables were evaluated using the chi-square test. Variables with a p-value < 0.05 in bivariate analyses were included in a multivariate logistic regression model to identify independent predictors of dual protection use. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated, and a p-value < 0.05 was considered statistically significant.

2.7. Ethical Considerations

The study was approved by the Institutional Ethics and Research Committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I and by the Institutional Ethics Committee for Human Health Research of the Far North Regional Delegation. Written informed consents from participants aged ≥ 18 were obtained. Informed consent from parents and assent from the adolescent girls < 18 were obtained. Confidentiality and anonymity of the participants were strictly respected.

3. Results

3.1. Population Characteristics

A total of 103 adolescent girls were recruited for the study. Twelve were excluded due to incomplete medical records, resulting in 91 eligible participants. Following age-based matching, 31 participants were excluded, and 60 were retained for analysis (**Figure 1**). These were matched in a 1:1 ratio, comprising 30 adolescents in the single-contraception group and 30 in the dual-contraception group. The final study sample therefore consisted of 60 participants.

The mean age of the adolescent girls was 18.0 ± 1.2 years (15 - 19 years). The majority of participants were from the Far North region (76.7%), Muslim (41.7%), with a secondary education (56.7%), and residing in urban areas (70%) (**Table 1**).

3.2. Sociodemographic Factors and Use of Dual Protection

Of the 91 teenage girls selected with complete records, 30 (32.9%) used dual protection. These were mainly those aged 19 years and who had a secondary level of

education. Univariate analysis showed that married adolescents were significantly less likely to use dual protection compared to those with a non-cohabiting partner (OR = 0.31; 95% CI: 0.08 - 0.72; p = 0.008) (**Table 2**).

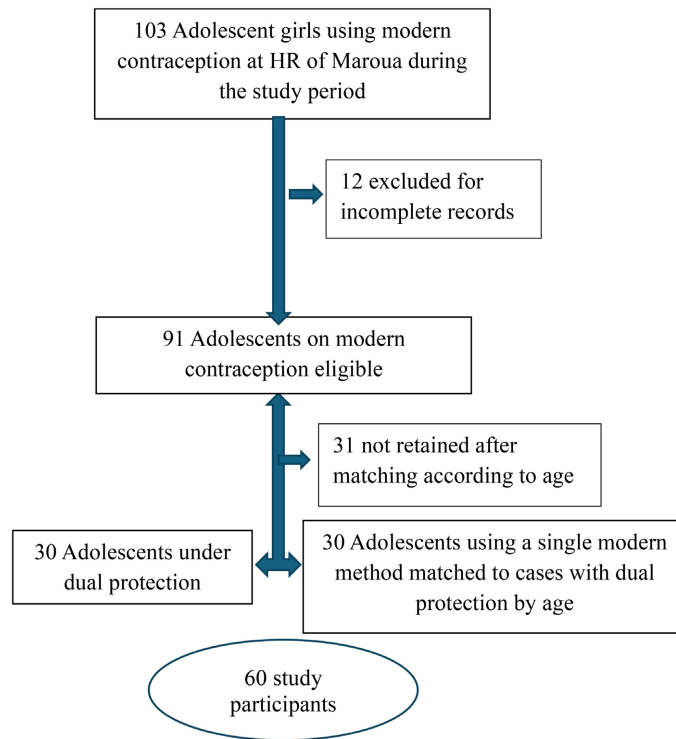


Figure 1. Flow diagram.

Table 1. Distribution of participants according to socio-demographic characteristics.

Variables	Dual Protection		Total n (%), N = 60
	YES n (%), N = 30	NO n (%), N = 30	
Region of origin			
Adamawa	2 (6.67)	1 (3.33)	3 (5.00)
East	2 (6.67)	0 (0.00)	2 (3.33)
Far North	21 (70.00)	25 (83.33)	46 (76.67)
Coastline	1 (3.33)	0 (0.00)	1 (1.67)
West	1 (3.33)	0 (0.00)	1 (1.67)
North	3 (10.00)	4 (13.33)	7 (11.67)
Religion			
Catholic	6 (20.00)	12 (40.00)	18 (30.00)
Muslim	13 (43.33)	12 (40.00)	25 (41.67)
Pentecostal	3 (10.00)	0 (0.00)	3 (5.00)
Protestant	8 (26.67)	5 (16.67)	13 (21.67)
Jehovah's Witnesses	0 (0.00)	1 (3.33)	1 (1.67)

Continued

Educational level			
Primary	7 (23.33)	8 (26.67)	15 (25.00)
Secondary	17 (56.67)	17 (56.67)	34 (56.67)
Superior	6 (20.00)	5 (16.67)	11 (18.33)
Occupation			
Pupil	6 (20.00)	6 (20.00)	12 (20.00)
Housewife	7 (23.33)	2 (6.67)	9 (15.00)
Student	5 (16.67)	6 (20.00)	11 (18.33)
Hairdresser	2 (6.67)	1 (3.33)	3 (5.00)
Seamstress	5 (16.67)	13 (43.33)	18 (30.00)
No job	3 (10.00)	2 (6.67)	5 (8.33)
Trade	1 (3.33)	0 (0.00)	1 (1.67)
Midwife	1 (3.33)	0 (0.00)	1 (1.67)

Table 2. Sociodemographic factors and use of dual protection.

Variables	Double Protection		Total N	OR [95% CI]	p-value
	YES n	NO n			
Marital status					0.047
Partner, does not live with her	16 (53.3)	11 (36.7)	27 (45.0)	1 (ref)	-
Married	5 (16.7)	11 (36.7)	16 (26.7)	0.31 [0.08 - 1.15]	0.081
Cohabitation	7 (23.3)	2 (6.7)	9 (15.0)	2.41 [0.42 - 13.83]	0.318
No partner	2 (6.7)	6 (20.0)	8 (13.3)	0.23 [0.04 - 1.35]	0.112
Guardian					0.937
Partner/husband	14 (46.7)	14 (46.7)	28 (46.7)	1 (ref)	-
Alone	4 (13.3)	3 (10.0)	7 (11.7)	1.33 [0.25 - 7.08]	1.000
Parents	6 (20.0)	9 (30.0)	15 (25.0)	0.67 [0.19 - 2.38]	0.749
Aunts/uncles	3 (10.0)	2 (6.7)	5 (8.3)	1.50 [0.22 - 10.40]	1.000
Cousins	2 (6.7)	1 (3.3)	3 (5.0)	2.00 [0.16 - 24.66]	1.000
Others	1 (3.3)	1 (3.3)	2 (3.3)	1.00 [0.06 - 17.62]	1.000
Funding					0.522
Partner/husband	16 (53.3)	14 (46.7)	30 (50.0)	1 (ref)	-
Myself	5 (16.7)	2 (6.7)	7 (11.7)	2.19 [0.37 - 13.10]	0.674
Parents	8 (26.7)	12 (40.0)	20 (33.3)	0.58 [0.19 - 1.84]	0.399
Aunts/uncles	1 (3.3)	1 (3.3)	2 (3.3)	0.88 [0.05 - 15.33]	1.000
Employer	0 (0.0)	1 (3.3)	1 (1.7)	0.44 [0.01 - 14.06]	0.484
Place of residence					0.294
Urban	20 (66.7)	22 (73.3)	42 (70.0)	1 (ref)	-
Rural	10 (33.3)	8 (26.7)	18 (30.0)	1.38 [0.45 - 4.17]	0.779

3.3. Clinical Factors

Dual protection was used more by adolescents who had their first sexual intercourse after 15 years (85%). History of STIs (40% vs 23.3%; OR = 2.19; 95% CI:

1.04 - 6.69; $p = 0.041$) and previous pregnancy (66.7% vs 46.7%; OR = 2.29; 95% CI: 1.09 - 6.49; $p = 0.038$) were significantly associated with the use of dual protection. Bivariate analysis revealed that adolescents with a history of sexually transmitted infections were more likely to adopt dual protection (40% vs 23.3%; OR = 2.19; 95% CI: 1.04 - 6.69; $p = 0.041$). Similarly, those with a previous pregnancy had increased odds of dual protection (66.7% vs 46.7%; OR = 2.29; 95% CI: 1.09 - 6.49; $p = 0.038$). Use of oral pills (OR = 4.12, 95% CI 1.39 - 12.26, $p = 0.011$) and male condoms (OR = 6.99, 95% CI 1.38 - 35.46, $p = 0.018$) were also positively associated with dual protection. Conversely, adolescents using long-acting reversible contraceptives (LARC) such as IUDs (OR = 1.02 [0.36 - 2.92], $p = 0.97$), implants (OR = 1.73 [0.59 - 5.06], $p = 0.32$), or injectable (OR = 2.14 [0.46 - 9.97], $p = 0.55$) were less likely to use dual protection (**Table 3**).

Table 3. Clinical factors and use of dual protection.

Variables	Dual Protection		OR [95% CI]	p-value
	YES n (%), N = 30	NO n (%), N = 30		
Number of pregnancies				0.460
0	9 (30.0)	14 (46.7)	1 (ref)	-
1	9 (30.0)	9 (30.0)	1.56 [0.45 - 5.41]	0.539
2	7 (23.3)	5 (16.7)	2.18 [0.53 - 9.02]	0.311
3	3 (10.0)	2 (6.7)	2.33 [0.32 - 16.82]	0.624
4	2 (6.7)	0 (0.0)	6.22 [0.25 - 154.21]	0.183
Number of births				0.450
0	13 (43.3)	16 (53.3)	1 (ref)	-
1	14 (46.7)	10 (33.3)	1.72 [0.58 - 5.14]	0.412
2	2 (6.7)	4 (13.3)	0.62 [0.10 - 3.91]	0.680
3	1 (3.3)	0 (0.0)	2.46 [0.08 - 79.33]	0.467
Age at first intercourse				0.988
10 - 14 years	5 (16.7)	4 (13.3)	1 (ref)	-
15 - 19 years	25 (83.3)	26 (86.7)	0.77 [0.19 - 3.20]	1.000
Number of sexual partners				0.286
1	16 (53.3)	14 (46.7)	1 (ref)	-
2	9 (30.0)	14 (46.7)	0.56 [0.19 - 1.69]	0.407
3	5 (16.7)	2 (6.7)	2.19 [0.37 - 13.10]	0.674
History of STIs	12 (40.0)	7 (23.3)	2.19 [1.04 - 6.69]	0.041
History of pregnancy	20 (66.7)	14 (46.7)	2.29 [1.09 - 6.49]	0.038
Desired pregnancy	8 (40.0)	7 (50.0)	0.67 [0.19 - 2.37]	0.569
History of abortion	7 (35.0)	4 (28.6)	1.35 [0.30 - 5.97]	0.683
Outcome of abortion				0.378
Anemia	5 (71.4)	2 (50.0)	2.25 [0.34 - 14.87]	0.392
Hemorrhagic shock	1 (14.3)	2 (50.0)	0.17 [0.01 - 2.20]	0.158
Endometritis	1 (14.3)	0 (0.0)	4.00 [0.14 - 113.62]	0.317

STI = Sexually transmitted infection.

3.4. Knowledge about Contraception and Dual Protection

All adolescents had heard of contraception, but only 53.3% had attended family planning service. Knowledge of pills (OR = 4.12; 95% CI: 1.39 - 12.26; $p = 0.011$) and male condoms (OR = 6.99; 95% CI: 1.38 - 35.46; $p = 0.018$) was positively associated with the use of dual protection (**Table 4**).

Table 4. Association between knowledge and use of contraception and dual protection (N = 60).

Variables	Dual Protection		Total n (%), N = 60	OR [95% CI]	p-value
	YES n (%), N = 30	NO n (%), N = 30			
Heard about contraception	30 (100.0)	26 (86.7)	56 (93.3)	1 (ref)	0.192
Consultation at the PF service	16 (53.3)	14 (53.8)	30 (53.6)	0.99 [0.40 - 2.44]	0.969
Known contraceptive					
Pills	18 (60.0)	7 (26.9)	25 (44.6)	4.12 [1.39 - 12.26]	0.011
Injection	27 (90.0)	21 (80.8)	48 (85.7)	2.25 [0.55 - 9.16]	0.247
Implant	19 (63.3)	13 (50.0)	32 (57.1)	1.69 [0.64 - 4.44]	0.318
IUD	14 (46.7)	12 (46.2)	26 (46.4)	1.03 [0.36 - 2.96]	0.969
Male Condom	28 (93.3)	17 (65.4)	45 (80.4)	6.99 [1.38 - 35.46]	0.018
Female Condom	15 (50.0)	11 (42.3)	26 (46.4)	1.35 [0.51 - 3.60]	0.568
Spermicide	3 (10.0)	0 (0.0)	3 (5.4)	-	0.240
Morning-after pill	7 (23.3)	5 (19.2)	12 (21.4)	1.28 [0.37 - 4.42]	0.711

In addition, all adolescents using dual protection had heard of it, mainly during educational talks (33.3%) and through the media (16.7%). Belief that dual protection is effective was strongly associated with its use (OR = 14.0; 95% CI: 3.66 - 53.59; $p = 0.002$) (**Table 5**).

Table 5. Use of modern contraception and adoption of dual protection.

Variables	Dual Protection		Total n (%), N = 60	OR [95% CI]	p-value
	YES n (%), N = 30	NO n (%), N = 30			
Contraceptive used					
Pills	7 (23.3)	1 (3.3)	8 (13.3)	9.00 [1.02 - 79.34]	0.048
Injection	9 (30.0)	9 (30.0)	18 (30.0)	1.00 [0.33 - 3.04]	1.000
Implant	10 (33.3)	4 (13.3)	14 (23.3)	3.50 [0.93 - 13.16]	0.063
IUD	2 (6.7)	0 (0.0)	2 (3.3)	-	0.492
Male Condom	30 (100.0)	18 (60.0)	48 (80.0)	6.99 [1.38 - 35.46]	<0.001
Female Condom	6 (20.0)	9 (30.0)	15 (25.0)	0.57 [0.18 - 1.77]	0.343
Spermicide	0 (0.0)	0 (0.0)	0 (0.0)	-	-
Morning-after pill	4 (13.3)	1 (3.3)	5 (8.3)	4.33 [0.45 - 41.51]	0.216

3.5. Use of Contraceptive Methods

The male condom was the most commonly used method, alone or in combination. All adolescent girls using dual protection reported using it consistently, and it was the factor most strongly associated with the adoption of this strategy (OR = 6.99; 95% CI: 1.38 - 35.46; $p < 0.001$) (Table 6). The most common combination was the association of an injectable contraceptive with the condom (36.6%) (Figure 2).

Table 6. Knowledge and perceptions of dual protection and its association with adoption (N = 60).

Variables	Dual Protection		Total n (%), N = 60	OR [95% CI]	p-value
	YES n (%), N = 30	NO n (%), N = 30			
Understood dual protection	30 (100.0)	6 (20.0)	36 (60.0)	–	<0.001
Source of knowledge about dual protection					0.120
Hospital / Health Centre	0 (0.0)	14 (46.7)	14 (38.9)	–	–
Pharmacies	1 (3.3)	1 (16.7)	2 (5.6)	0.18 [0.01 - 3.70]	0.242
Educational talk	10 (33.3)	4 (66.7)	14 (38.9)	5.00 [0.95 - 26.24]	0.056
Media	5 (16.7)	1 (16.7)	6 (16.7)	5.00 [0.52 - 48.11]	0.158
Definition of dual protection					0.177
Use of 2 modern contraceptive methods	9 (30.0)	4 (66.7)	13 (36.1)	0.20 [0.05 - 0.90]	0.036
Use of 2 modern hormonal contraceptives	7 (23.3)	0 (0.0)	7 (19.4)	–	0.078
Use of 2 methods including condom	14 (46.7)	2 (33.3)	16 (44.4)	2.00 [0.37 - 10.72]	0.412
Perceived importance of dual protection					0.056
Prevents pregnancy	4 (13.3)	0 (0.0)	4 (11.1)	–	0.142
Prevents STIs	14 (46.7)	6 (100.0)	20 (55.6)	0.05 [0.01 - 0.55]	0.010
Prevents both pregnancy & STIs	12 (40.0)	0 (0.0)	12 (33.3)	–	0.003
Perceived risk of dual protection	3 (10.0)	0 (0.0)	3 (8.3)	–	0.237
Perceived effectiveness of dual protection	28 (93.3)	2 (40.0)	30 (90.9)	14.03 [3.66 - 53.59]	0.002
Perceived cost of dual protection (expensive)	10 (33.3)	3 (60.0)	13 (37.1)	0.29 [0.07 - 1.13]	0.057

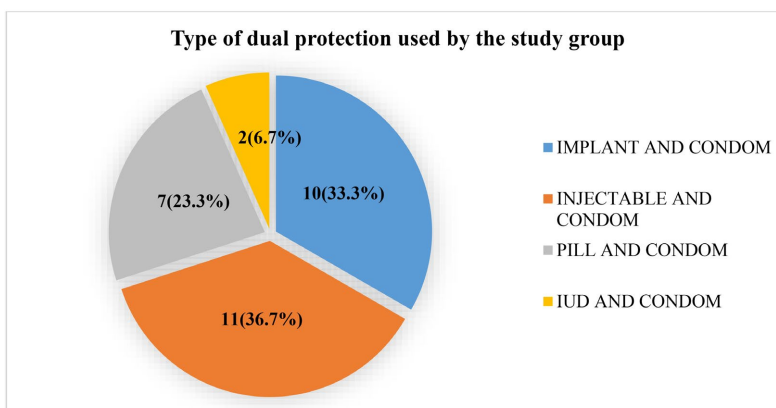


Figure 2. Distribution of cases according to the type of combination used for dual protection.

3.6. Multivariate Analysis

After adjustment, four independent determinants of the use of dual protection were identified (**Table 7**). Among adolescents, being married was strongly associated with lower use of dual protection (aOR = 0.14; 95% CI: 0.02 - 0.92; p = 0.041), whereas a history of previous pregnancy (aOR = 2.03; 95% CI: 1.01 - 31.16; p = 0.044), male condom use (aOR = 5.01; 95% CI: 2.51 - 11.67; p = 0.003), and a positive perception of dual protection effectiveness (aOR = 11.1; 95% CI: 1.71 - 71.56; p = 0.011). were all significantly associated with higher uptake. These findings highlight the need for targeted interventions to promote dual protection, particularly among married adolescents, to reduce unintended pregnancies and sexually transmitted infections.

Table 7. Factors independently associated with the use of dual protection.

Variable	OR [95% CI]	p-value	aOR [95% CI]	p-value
Being married	0.31 [0.08 - 0.72]	0.008	0.14 [0.02 - 0.92]	0.041
History of STIs	2.19 [1.04 - 6.69]	0.041	1.87 [0.89 - 7.67]	0.091
History of Pregnancy	2.29 [1.09 - 6.49]	0.038	2.03 [1.01 - 31.16]	0.044
Known pills	4.12 [1.39 - 12.26]	0.011	3.99 [0.17 - 96.36]	0.390
Known Male Condom	6.99 [1.38 - 35.46]	0.018	6.27 [0.68 - 57.82]	0.119
Male condom used	6.99 [1.38 - 35.46]	<0.001	5.01 [2.51 - 11.67]	0.003
Think double effective protection	14.03 [3.66 - 53.59]	0.002	11.1 [1.71 - 71.56]	0.011

4. Discussion

This study, conducted among adolescent girls at the Maroua Regional Hospital in 2024, aimed to assess the proportion of adolescent girls using dual contraception and explored the key factors influencing its adoption. The results revealed that only 32.9% of participants, corresponding to approximately one-third of the study population, reported using this strategy. This proportion is relatively high

when compared with findings from other African contexts and authors. For instance, in a study conducted among female university students in Ethiopia, only 20.5% of sexually active female students reported using dual protection in the last 12 months [9]. Conversely, higher rate has been documented in Rwanda. In this country, the use of dual protection by young women was 40% in 2022 [10]. These discrepancies could be related to the differences in sociocultural norms, access to reproductive health services, and variations in local awareness-raising conducted by family planning services. In addition, the fact that only one-third of adolescents in our setting adopt dual protection highlights a significant gap in the prevention of both unintended pregnancies and sexually transmitted infections.

4.1. Sociodemographic Characteristics

In our study, the average age of adolescent girls was 18.03 years (15 - 19 years). This result is close to that reported by Mekoné *et al.* (2024) in Yaoundé among sexually active adolescent girls, as well as the 2011 EDS, which placed the median age of first sexual intercourse at 17 years [11] [12]. The literature indicates an average age of 17.6 years for sexual initiation, generally linked to desire, peer influence and curiosity, factors reported by more than half of adolescent girls [13].

Furthermore, we observed that married adolescent girls were less likely to use dual protection compared with their unmarried peers. This pattern is consistent with findings from other sub-Saharan African studies, where marital status has been identified as a key determinant of contraceptive choice [5]-[7]. This trend could be explained by the fact that: First, married adolescents often perceive themselves at lower risk of sexually transmitted infections (STIs) within the context of a monogamous union, leading to lower condom use despite ongoing risk of HIV or other infections. Second, sociocultural norms and gender dynamics may limit their autonomy in negotiating condom use with spouses [6] [12]. In many settings, married adolescent girls have limited decision-making power regarding reproductive health, and condom use may be stigmatized or perceived as mistrust within marriage [6] [12]. Third, there may be a greater focus on pregnancy prevention via other contraceptive methods, such as pills or injectables, rather than dual protection.

4.2. Clinical Factors

In our study, the majority of adolescents using dual protection had a past history of sexually transmitted infection (46.67%) and unwanted pregnancy (60%). This result is consistent with the results of Kottle *et al.* (2015) [14]. This could be explained by the fact that prior exposure to STIs may increase awareness of sexual health risks and motivate protective behaviors. These findings align with previous studies showing that personal experience with STIs can enhance risk perception and lead to higher condom use or adoption of dual protection methods [15]. These results suggest that personal experience of a reproductive or infectious risk promotes the adoption of more preventive measures.

4.3. Knowledge and Attitudes

Although all participants were aware of contraception in general, only 16 (44.4%) understood the concept of dual protection and its significance.

This study identified the male condom as a strong determinant of dual protection, both in terms of knowledge and actual use. This finding aligns with UNFPA data, which highlight that the condom remains the most well-known and accessible method among adolescent girls in sub-Saharan Africa [16]. Several factors may explain the prominence of condoms. They are widely promoted through public health campaigns, easily available in pharmacies and health centers, and often included in sexual education programs.

However, despite high knowledge and reported use of condoms, dual protection uptake remains low, suggesting that awareness alone is insufficient to ensure consistent practice. Factors such as partner negotiation, sociocultural norms, perceived trust within relationships, and stigma surrounding condom use may limit their wide adoption.

4.4. Independent Determinants

After adjustment, four main determinants of dual protection emerged: marital status, pregnancy history, male condom use, and belief in its effectiveness. Married adolescents were less likely to use dual protection, likely due to perceived low STI risk and reliance on hormonal contraception. Prior pregnancy or STI experience increased uptake, suggesting that personal risk motivates protective behavior. Male condom use was the strongest determinant, reflecting its accessibility and dual role in preventing both STIs and pregnancy. Finally, belief in the effectiveness of dual protection influenced adoption, highlighting the importance of knowledge and risk perception. These results are consistent with those of a multinational analysis in West and East Africa, which identified education, reproductive experience, and method perceptions as major determinants of dual contraception use [17] [18].

These results show that in Cameroon, despite good general awareness of contraception, the understanding and adoption of dual protection remains limited by social and cultural factors. It appears necessary to:

- Strengthen adolescent-friendly sex education programs, with an emphasis on dual protection;
- Involve married couples in awareness campaigns to reduce the low adoption observed in this category.
- Further integrate family planning and STI prevention services to provide a truly combined approach.

4.5. Boundaries

The study has some limitations, including the small sample size and its single-center nature, which limit the generalizability of the results. Data were self-reported, which may be affected by social desirability bias, particularly regarding

sexual behavior and contraceptive use. In addition, the relatively small sample size, contributed to wide confidence intervals for several adjusted odds ratios. This reflects limited precision; these findings should therefore be interpreted with caution. Larger, multicenter studies are needed to confirm these associations and provide more precise estimates of the independent predictors of dual protection use.

5. Conclusion

The use of dual protection among adolescent girls in Maroua remains low despite general awareness of contraception. Prior experiences with STIs or unintended pregnancies, male condom use, and belief in its effectiveness were key motivators. These findings suggest the need for targeted strategies combining family planning and STI prevention to increase adoption of dual protection.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] World Health Organization (WHO) (2025) Adolescent Pregnancy. <https://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy>
- [2] NGO Plan International France (2025) Causes and Consequences of Teenage Pregnancies. <https://www.plan-international.fr/nos-combats/sante-sexuelle-et-reproductive/causes-et-consequences-des-grossesses-precoces/>
- [3] UNAIDS (2022) Global AIDS Update 2022: In Danger. Joint United Nations Program on HIV/AIDS. <https://www.unaids.org/en/resources/documents/2022/in-danger-global-aids-update>
- [4] Deignan, C., Odiachi, A., Kisaakye, P., Woks, N.I.E., Amongin, D., Spindler, E., *et al.* (2025) Capturing the Dynamic Nature of Choice: Qualitative Perspectives on Contraceptive Acceptability from Cameroon and Kenya. *Studies in Family Planning*, **56**, 482-510. <https://doi.org/10.1111/sifp.70030>
- [5] Edietah, E.E., Njotang, P.N., Ajong, A.B., Essi, M.J., Yakum, M.N. and Mbu, E.R. (2018) Contraceptive Use and Determinants of Unmet Need for Family Planning; a Cross Sectional Survey in the North West Region, Cameroon. *BMC Women's Health*, **18**, Article No. 171. <https://doi.org/10.1186/s12905-018-0660-7>
- [6] Coulibaly, M., Doukouré, D., Kouamé, J., Ayékoé, I.A., Mélédje-Koumi, M., Malik, S., *et al.* (2020) Obstacles socioculturels liés à l'utilisation de la contraception moderne en Côte d'Ivoire. *Santé Publique*, **32**, 389-397. <https://doi.org/10.3917/spub.204.0389>
- [7] Fouelifack, F.Y., Mengue, C.C.T., Ofeh, M.A., Fouelifa, L.D. and Fouedjio, J.H. (2022) Unmet Needs for Family Planning among Adolescent Girls Giving Birth in Three Teaching Hospitals in Yaoundé. *Open Journal of Obstetrics and Gynecology*, **12**, 849-862. <https://doi.org/10.4236/ojog.2022.128072>
<https://www.scirp.org/journal/paperinformation?paperid=119408>
- [8] Duranteau, L. (2021) Contraception dans le contexte de l'adolescente. *Médecine Sciences*, **37**, 873-881. <https://doi.org/10.1051/medsci/2021148>

- [9] National Institute of Statistics (INS) and ICF (2020) Cameroon Demographic and Health Survey 2018. Yaoundé, Cameroon and Rockville, Maryland. INS and ICF.
- [10] Mekone Nkwele I, D.J. (2024) Use of Contraceptive Methods among Sexually Active Adolescent Girls in Schools in Yaoundé. *Health Sciences and Disease*, **25**, 113-116.
- [11] Bilongo, P.B. (2013) Knowledge, Attitudes and Practices of Family Planning among Adolescents in School Settings in the City of Douala. Doctoral Thesis in Medicine, University of Douala.
<https://www.memoireonline.com/09/19/11005/Connaissances-attitudes-et-pratiques-de-la-planification-familiale-chez-les-adolescents-en-milieus.html>
- [12] Feyisa, B.N., Debelew, G.T. and Koricha, Z.B. (2025) Predictors of Dual Protection Use Based on Information-Motivation-Behavior Skill Model among Female University Students: A Cross-Sectional Study. *Frontiers in Reproductive Health*, **7**, Article ID: 1407854. <https://doi.org/10.3389/frph.2025.1407854>
<https://www.frontiersin.org/articles/10.3389/frph.2025.1407854/full>
- [13] Renzaho, J.N. and Rutayisire, E. (2022) Dual Contraceptive Use and Associated Factors among Women Aged 15-49 Years on Antiretroviral Therapy in Kayonza District, Rwanda: A Cross-Sectional Study. *Pan African Medical Journal*, **42**, Article 45.
<https://doi.org/10.11604/pamj.2022.42.45.33460>
- [14] Kottke, M., Whiteman, M.K., Kraft, J.M., Goedken, P., Wiener, J., Kourtis, A.P., *et al.* (2015) Use of Dual Methods for Protection from Unintended Pregnancy and Sexually Transmitted Diseases in Adolescent African American Women. *Journal of Pediatric and Adolescent Gynecology*, **28**, 543-548. <https://doi.org/10.1016/j.jpag.2015.04.008>
<https://pubmed.ncbi.nlm.nih.gov/articles/PMC4618263/>
- [15] Kosugi, H., Shibamura, A., Kiriya, J., Ong, K.I.C., Mucunguzi, S., Muzoora, C., *et al.* (2020) Positive Deviance for Dual-Method Promotion among Women in Uganda: A Qualitative Study. *International Journal of Environmental Research and Public Health*, **17**, Article 5009. <https://doi.org/10.3390/ijerph17145009>
- [16] United Nations Population Fund (2025) Adolescents and Youth Dashboard.
<https://www.unfpa.org/ha/data/dashboard/adolescent-youth>
- [17] Koumba Maguena, R., Alves Jorge, S., Ngoungou, E.B. and Van den Broucke, S. (2025) Determinants of Adolescent Sexual Behavior in Sub-Saharan Africa: A Systematic Review of In-School and Out-of-School Adolescents. *Public Health Reviews*, **46**, Article 1608357. <https://doi.org/10.3389/phrs.2025.1608357>
<https://www.ssph-journal.org/articles/10.3389/phrs.2025.1608357/full>
- [18] Ahinkorah, B.O. (2020) Predictors of Unmet Need for Contraception among Adolescent Girls and Young Women in Selected High Fertility Countries in Sub-Saharan Africa: A Multilevel Mixed Effects Analysis. *PLOS ONE*, **15**, e0236352.
<https://doi.org/10.1371/journal.pone.0236352>
<https://dx.plos.org/10.1371/journal.pone.0236352>