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Investigating Determinants Affecting the Adoption of Contemporary Contraceptive Methods: A Cross-Sectional Analysis of Adolescent Utilization in the Nabdan District, Upper East Region, Ghana

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Promoting the use of contraception among adolescents is essential to improving their sexual and reproductive health. Teenage pregnancies are becoming more common, and the Nabdam area continues to have low rates of use of contemporary contraceptive methods. These

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facts highlight the urgent need to address the needs of adolescents concerning their sexual and reproductive health. This study aims to investigate the factors impacting the Upper East Region of Ghana's Nabdam District's adoption of contemporary contraceptive methods.

Methods: 261 older teenage girls from the Nabdam district, ages 15 to 19, were included in the study, which used a quantitative technique and a descriptive cross-sectional design. Respondents were chosen using a multiphase sample technique, and data were collected over the course of 10 working days using a standardized survey form. STATA Version 14 was utilized for data analysis. A significance criterion of $p < 0.05$ was applied to bivariate and logistic regression models to investigate any correlations between independent factors and outcome variables.

Results: 52.1% of respondents said they have had their first sexual experience before turning 20. The oldest stated age at first sex was 19 years old, while the youngest was 10 years old. Additionally, 97.8% of respondents reported learning about contemporary contraception via a variety of sources, such as peers, instructors, health professionals, and radio media. Even with this knowledge, 48.7% of respondents thought using a contraceptive technique would provide 100% protection against getting pregnant, while 73.6% of respondents had never used any kind of birth control. Age ($p< 0.001$), educational attainment ($p< 0.001$), marital status ($p< 0.001$), peer influence ($p< 0.001$), place of residence ($p< 0.001$), religious affiliation ($p< 0.018$), consent from a sexual partner ($p< 0.001$), positive attitudes from healthcare providers ($p < 0.001$), and the availability of contraceptives ($p < 0.001$) were discovered to be linked to the usage of modern contraceptives.

Conclusion: Although a sizable percentage of respondents showed awareness of contemporary contraceptive methods, low modern contraceptive usage was significantly correlated with several factors, including age, marital status, educational attainment, peer influence, partner consent, and the unfavorable attitudes of healthcare professionals. To tackle this problem, a community-based strategy emphasizing the advancement of enabling elements and the removal of obstacles is required. The Ghana Health Service could enhance its School Health Education Program (SHEP) by increasing informational sessions, organizing theatrical productions and debates, and recruiting peer educators as invaluable resources to share experiences and instruct their peers on sexuality, reproductive health issues, and the use of modern contraceptives

Keywords: Modern; contraceptives; utilization; prevalence; adolescents; factors.

1. INTRODUCTION

Encouraging teenagers to take contraception is crucial to enhancing their sexual and reproductive health [1]. Estimates indicate that there could be an 83% decrease in unintended pregnancies (about eighteen (18) million to about (3) million), an 84% decline in risky abortions (from about 1 million to less than a million), a 68% decrease in maternal deaths (from 183,000 to 58,560 per year), and an 82% decrease in newborn deaths (from 1.2 million to 216,000) if full access to modern contraceptives and adequate healthcare is granted [2].

Numerous studies conducted in sub-Saharan Africa have determined the factors that impact the adaptation of contraceptives by young people. These factors include a lack of options, insufficient counseling regarding their effectiveness, irregular contraceptive supply, unfavorable provider attitudes, and demographic variables like age, sex, and marital status [3-6]. Studies conducted in southern Ethiopia revealed a strong correlation between women's age and awareness regarding contraception and their use of it [7]. Similar to this, partner involvement or consent was found to be a factor in determining the usage of contemporary contraceptives in the Amhara Region of Ethiopia [8].

With a frequency of 23% among women aged 15-49, low contraceptive use poses a public health problem in Ghana [9]. The percentage of married teens (15–19 years old) who use contraceptives is extremely low, at 19% [10]. A variety of characteristics, including age, marital status, ethnicity, religious affiliation, educational background, work position, frequency of visits to health facilities, and understanding of the ovulatory cycle, influence the use of contraceptives among female teenagers in Ghana [11].

Few teenagers in low-income environments use modern contraceptives, even though contraception is widely acknowledged to be beneficial for postponing, spacing, or stopping childbearing as well as lowering unplanned pregnancies and abortions [12,13]. Teenagers'

access to and understanding of contraceptives is a recurrent problem in Sub-Saharan Africa [14]. Despite family planning and school health programs being in place, teenage pregnancy rates are a problem in the Upper East region of Ghana, where the Nabdam district is located [15].

Despite the implementation of birth control and health education initiatives, the overall fertility rate in the Nabdam area is still high at 6.6 [15], above both regional and national averages. Pregnancies among teenagers require targeted interventions in adolescent reproductive and sexual well-being [16]. To address these issues, the purpose of this study is to look at the factors impacting the Nabdam District's modern contraceptive usage.

2. METHODOLOGY

2.1 Study Area

The neighboring districts of the Upper East Region's Nabdam District are the Bongo District to the north, the Talensi District to the south, the Bawku West District to the east, and the Bolgatanga Municipality to the west of it. The gender breakdown of adolescents is 16,955 females (50.1%) and 16,871 males (49.9%), making up 41.7% of the total population [10].

Agriculture is the largest industry, employing 85.9% of the labor force in jobs like farming, raising animals, and planting trees [17]. "The district operates thirteen Community-Based Health Planning and Services (CHPS) centers, two medical facilities, and two clinics to meet healthcare needs." These clinics provide family planning, prenatal and postnatal care, laboratory testing, outpatient departments (OPD), and other services [16].

2.2 Study Design and Population

The study focused on teenage girls who had reached the age of menarche, which is significant for the results of adolescent sexual activity and pregnancy. Adolescent females in the Nabdan District were included in the study using a quantitative descriptive cross-sectional design, which was based on age requirements and factors associated with mental health and involvement. By guaranteeing a targeted and representative sample population, these guidelines made sure the research's conclusions were reliable and pertinent.

2.3 Sample Size

Out of 33,826 residents in the district, nearly 42.0% of the residents are adolescents [10]. In order to draw conclusions regarding the larger adolescent population, a sample of this group was chosen because of its size. Using Cochran's method [18], the right sample size for the investigation was determined.

A 5% margin of error and a 95% confidence interval were taken into account for this computation. In Ghana, 19% of teenagers between the ages of 15 and 19 report using contraceptives [15]. As a result, 237 was chosen as the sample size.

A 10% upward adjustment was used to allow for any non-response. Consequently, 261 teenagers make up the final sample size as 10% of 237 equals 24.

2.4 Sampling Technique

Out of the five sub-districts under the Nabdam District Health Administration (DHA), Kongo (the Pitanga sub-district) was selected to simplify the study's sample procedure. Time, money, and the particular goals of the research served as practical guiding factors for this choice. The sub-district for the study was chosen in the first stage of a multi-stage sample procedure using a basic random sampling method. The second stage then used pre-existing data on home numbers and an electronic or computer-based number generator to randomly select 261 dwellings within the selected sub-district.

Respondents were methodically selected from these households for the third step. A household was taken into consideration for the study if it contained just one teenager who fit the inclusion criteria. When more than one adolescent lived in a chosen home, only one of the adolescents was included using a random selection procedure. Similarly, one home out of multiples that had identified suitable youths was selected using a random selection process. The process was designed with a deliberate, randomized approach in mind.

The selected home was shifted to the next in line if not a single youngster living there met the conditions for admittance. To improve the representativeness and reliability of the study, a rigorous multi-stage sampling process was utilized to guarantee a comprehensive and

unbiased selection of sub-districts, dwellings, and participants.

2.5 Study Variables and Data Sources

The use of modern contraceptive techniques, such as intrauterine devices (IUDs), pills, injectables, implants, female sterilization, lactational amenorrhea method (LAM), and female condoms, was the study's dependent or outcome variable. Three categories were used to classify independent variables: social influences, healthcare, and individual aspects. Age, educational attainment, religion, and marital status were examples of individual characteristics. The availability of contemporary contraception, the existence of service areas such as adolescent health corners, and the attitudes of caregivers were all considered health service factors. Social determinants included beliefs about teenage contraception users in the public eye, parental and peer pressure, religious doctrines and customs, and partner consent. A complete investigation of all the factors impacting the research participants' usage of contemporary contraceptives was made possible by this extensive classification.

2.6 Instruments for Data Collection

The study used a well-crafted survey questionnaire specifically intended to gather data from teens. Drawing on the literature study [19, 20], our questionnaire included both closed- and open-ended questions to facilitate thorough replies. To ensure the survey's validity and applicability, twenty adult youths from the Telesi District participated in a pretest where the framework and question formulation were improved based on shared features. Based on input from the pretest, changes were made to correct ambiguities and mistakes in a number of the questions. To guarantee ease of answer and comprehension, especially for youths who are not as fluent in English, the questionnaire, which was originally developed in English, was delivered in both the regional dialect and English.

2.7 Data Collection Procedure

Five research assistants who were all graduates of nearby colleges and inhabitants of the district helped with the data-gathering procedure. These research enumerators would be trained on the aims of this research. They were educated on how to obtain consenting and assenting for those less than 18 years old; these include establishing rapport before the research, protecting the respondents' privacy and confidentiality, understanding the measuring items, and efficiently recording the responses of the respondents.

The study researchers collaborated regularly with the investigators and their volunteers who had undergone instruction regarding this field over the course of the ten designated working days for data collection. The purposeful cooperation aimed to achieve reliability, completeness, and dedication to ethical criteria in the data collection approach.

2.8 Data Entry and Cleaning

The information gathered from the study was painstakingly input into a computer program and safely kept in a password-protected folder. The information was carefully cleaned to guarantee correctness and honesty, which improved the data's security and dependability.

2.9 Data Management and Analysis

The responses to the surveys were meticulously cleaned and coded before being entered into the Epi Info 3.5.1 application. After this, the information provided was exported using STATA Version 14 for additional analysis. Descriptive statistical techniques including mean, median, and standard deviation were initially used to characterize the research respondents and other pertinent characteristics.

Bivariate and multivariate logistic regression studies provided a thorough analysis of the relationships between the independent factors and outcome variables. A chi-square analysis was also performed to look for connections between the outcome variable and the pertinent independent factors. A careful examination and interpretation of the study's findings were guaranteed by the choice of $p<.05$ as a statistically significant threshold.

3. RESULTS AND DISCUSSION

3.1 Demographic Characteristics

Table 1 shows the average age of 16.7 older adolescent females in Ghana's Upper East Region, who are between the ages of 15 and 19 years. The majority (72.8%) of respondents were living with parents, 82.3% were single, 79.7% were Christians and 64.0% had completed junior high school. It's interesting to note that 75.5% of mothers and 78.2% of fathers lack literacy.

Table 1. Demographic Characteristics of Respondents (n=261)

Characteristics	Frequency (N)	Percentage (%)
Age (years)		
Mean ± SD	16.7 ± 1.4	
Education Level		
No education	16	6.1
Primary	52	19.9
Junior High School	167	64.0
Senior High School	26	10.0
Religious Affiliation		
Christians	208	79.7
Muslims	14	5.4
Traditionalist	20	7.6
Others	19	7.3
Marital Status		
Married	46	17.6
Single	215	82.3
Living Arrangement		
Living with parents	190	72.8
Courting	45	17.2
Living with guardian	26	10.0
Father's Education		
Uneducated	204	78.2
Basic education	46	17.6
Above Senior High School (SHS)	11	4.2
Mother's Education		
Uneducated	197	75.5
Primary	34	13.0
Junior High School (JHS)	21	8.0
Senior High School (SHS)	7	2.7
Tertiary	2	0.8

3.2 Sexual Behaviour Among Adolescents

The average age of the respondents, as indicated by the table, is 15.8, and 52.1% of them are sexually active. 29.4% of people used contraception at first, and 45.6% used it last. Different experiences and behaviors underline the necessity of focused interventions as illustrated in Table 2.

3.3 Awareness and Knowledge of Modern Contraceptives

The information on contraceptive awareness, information sources, knowledge of contemporary techniques, opinions on their efficacy, and views toward women's decision-making over the use of contraceptives are all included in the table. Significant sources of knowledge include instructors (37.9%) and the media (25.8%), with 69.7% of respondents indicating that they are aware of contraceptives. 81.9% of those who are informed are aware of contemporary methods of contraception, with injectables (27.5%), tablets (26.8%), and female condoms (26.8%) being the most widely recognized. There are false beliefs out there, too, since 28.9% of people think that current contraceptives offer 100% protection. The majority of respondents (96.6%) are aware of where to get contraception, with clinics accounting for 48.3% of the total. Remarkably, 69% of respondents think that a woman decides to utilize contraception. 52.1% of respondents had a troubling frame of view, linking contemporary contraception users to promiscuity. These results highlight the necessity of thorough education to clear up misunderstandings and encourage wise choices about the use of contraceptives as shown in Table 3.

3.4 Modern Contraceptive Use Among Adolescents

The population surveyed's preferences and habits around contraception are reflected in the statistics. Of the respondents, 26.1% have utilized contemporary methods of birth control,

with pills accounting for the majority of usage (49.2%), trailed by injectables (34.9%). Presently, 18.8% use contraceptives, mostly pills (36.7%) and injectables (42.9%). The community's primary source of contraceptives is health workers/centers (73.6%), followed by chemical shops (31.8%) and partners (5.4%). Pregnancy control is the most common reason (81.0%) for using contemporary contraceptives; other reasons include childbearing delay (20.6%) and STI prevention (50.8%) as shown in Table 4.

The data reveals that 33.7% of respondents utilized short-term contraceptive methods, such as pills and condoms, while 66.3% opted for long-term methods like implants and intrauterine devices as shown in Fig. 1.

3.5 Factors Influencing Adolescents Use of Modern Contraceptives

The results showed that the association between the use of modern contraceptives was statistically significant with the age of respondents (p< .001), the educational level of respondents (p< .001), marital status (p< .001), peer influence (p< .001), where respondent stayed (p< .001), religious status (p< .018), sexual partner (p< .001), partner consent (p< .001), positive attitude of health workers (p< .001) and contraceptive availability (p< .001). However, factors such as knowledge of contraceptive usage and a place to get contraceptives and health service points had no significant association with contraceptive use.

3.6 Discussion

This research aims to evaluate the factors impacting the utilization of modern contraceptives among adolescents in the Nabdam district. Prior studies, such as one by Ramjee & Daniels [21], have indicated that a substantial proportion of adolescents engage in sexual activity before turning 20, with approximately 75% reported in Sub-Saharan Africa. Similarly, our study reveals that more than half of respondents have had sexual experiences before reaching the age of 20, ranging from a minimum age of 10 to a maximum of 19. Common factors contributing to these patterns across studies include the low-income settings of developing countries in Sub-Saharan Africa, adolescents' natural curiosity about sex, parents' reluctance to discuss sex and peer influence.

Table 2. Sexual Behaviour Among Adolescents

Variables	Frequency (N)	Percentage (%)
Ever engaged in sexual activity		
Yes	136	52.1
No	125	47.9
Age at initiation of sexual activity		
Mean ± Standard Deviation	15.8 ± 1.4	
Condoms/ modern contraceptive usage at First Sex (n = 136)		
Yes	40	29.4
No	96	70.6
Contraceptive Use at Last Sexual Encounter (n = 136)		
Yes	62	45.6
No	74	54.4
Number of sexual partners		
None	131	50.2
One	119	45.6
Two	9	3.4
Three	2	0.8
Engaged in Sexual Activity While Intoxicated (n = 136)		
Yes	15	11.0
No	121	89.0
Use of Contraceptives While Intoxicated (n = 15)		
Yes	5	33.3
No	10	66.7
Felt Pressured to Engage in Unprotected Sex (n = 95)		
Yes	68	71.6
No	27	28.4

Table 3. Awareness and knowledge of modern contraceptives

Variable	Frequency	Percentage (%)
Awareness about contraceptives		
Yes	182	69.7
No	79	30.3
Source of information		
Teachers	69	37.9
Media	47	25.8
Health worker	28	15.4
Friends & Family	38	20.9
Know of modern contraceptive methods (n = 182)		
Yes	149	81.9
No	33	18.1
Modern contraceptives methods you have heard about (n = 149)		
Injectables	41	27.5
Pills	40	26.8
Female condom	40	26.8
IUD	18	12.1
LAM	6	4.0
Others (vaginal loop)	4	2.7
Modern contraceptives provide 100.0% protection (n = 149)		
Yes	106	71.1
No	43	28.9
Knows a place to get modern contraceptives (n = 149)		
Yes	144	96.6
No	5	3.4
A designated location to obtain these contraceptives (n = 149)		
Clinic	72	48.3 1
Drug store	32	21.5
Family planning clinic	21	14.1
Health worker	20	13.4
Peers	3	2
Family members	1	0.7
The use of contraceptives is the decision of the woman		
Yes	81	31.0
No	180	69.0
Women who use modern contraceptives are promiscuous		
Yes	136	52.1
No	125	47.9

Table 4. Modern Contraceptive Use Among Adolescents

Characteristics	Frequency	Percentage (%)
Used modern contraceptives		
Yes	63	26.1
No	198	73.9
Methods used before (n = 63)		
Pills	31	49.2
Injectables	22	34.9
Female condom	10	15.9
IUD	4	6.3
Implants	1	1.6
Currently using any contraceptive method		
Yes	49	18.8
No	212	81.2

Characteristics	Frequency	Percentage (%)
Methods currently used (n = 49)		
Injectables	21	42.9
Pills	18	36.7
IUD	5	10.2
Implants	3	6.1
LAM	2	4.1
A location to obtain contraceptives within the community		
Health worker/center	192	73.6
Chemical store	83	31.8
Partner	14	5.4
Others	7	2.7
Purpose for employing/using modern contraceptives (n=63)		
Pregnancy control	51	81.0
Childbirth delqy	13	20.6
STIs prevention	32	50.8
Others (space birth)	3	4.8

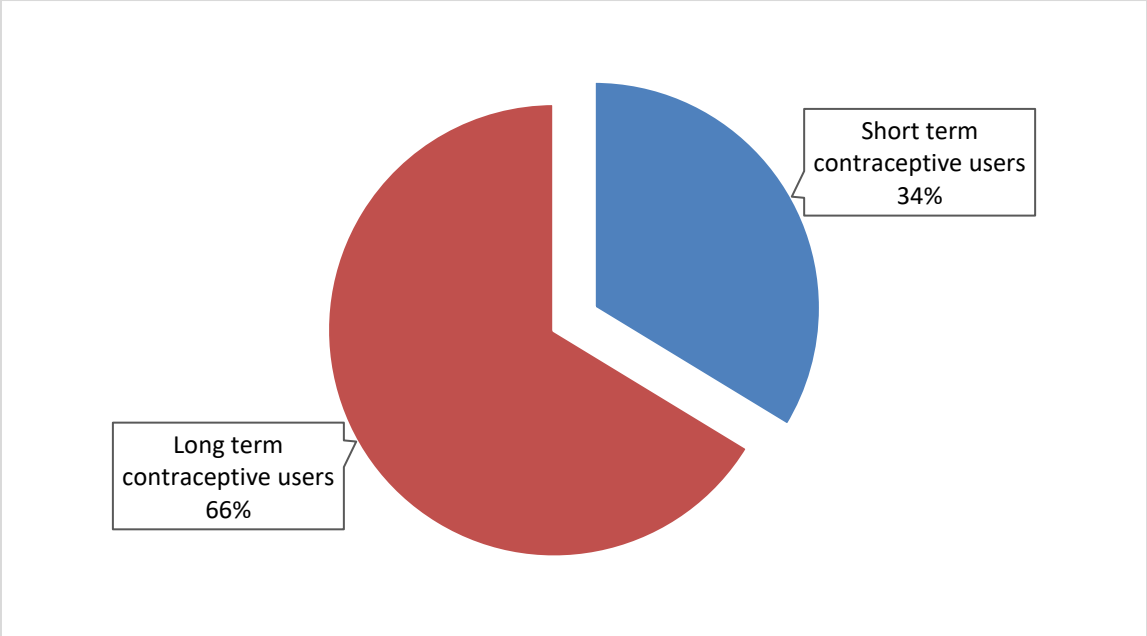

Fig. 1. Type of modern contraceptive

Table 5. Factors Influencing Modern Contraceptive Usage by Adolescents'

Variables	Contraceptive use, n (%)		p-value
	No	Yes	
Age group			
15 –17	93 (69.4)	41 (30.6)	.000
18 –19	115(90.5)	12 (9.5)	
Educational level			
Uneducated	7 (41.2)	10 (58.8)	.000
Primary	39 (76.5)	12 (23.5)	
J. H. S	142 (85.5)	24 (14.5)	
S. H. S	20 (74.1)	7 (25.9)	
Marital status			
Married	23 (51.5)	22 (48.9)	.000
Unmarried	185 (85.6)	31 (14.4)	

Variables	Contraceptive use, n (%)		p-value
	No	Yes	
Knowledge of a place to get contraceptive			
No	5 (4.9)	97 (97.0)	.166
Yes	0 (0.0)	53 (53.0)	
Stayed with			
Parents	163 (85.3)	28 (14.7)	.000
Guardian	21 (87.5)	3 (12.5)	
Partner	24 (52.2)	22 (47.8)	
Religious status			
No	150 (76.5)	46 (23.5)	.018
Yes	59 (90.8)	6 (9.2)	
Knowledge of contraceptive usage			
No	100 (77.5)	29 (22.5)	.423
Yes	108 (81.8)	24(18.2)	
Peer influence			
No	85 (40.7)	124 (59.3)	.001
Yes	8 (15.4)	44(84.6)	
Have a sexual partner			
No	130 (99.2)	1 (0.8)	.000
Yes	79 (60.8)	51 (39.2)	
Partner consent			
No	160 (87.9)	22 (12.1)	.001
Yes	56 (70.9)	23 (29.1)	
A positive attitude of Health workers			
No	54 (96.4)	2 (3.6)	.000
Yes	155 (75.6)	50 (24.4)	
Availability of Contraceptive			
No	45 (97.8)	1 (2.4)	.001
Yes	164 (76.3)	51 (23.7)	
Available service points influence contraceptive use			
No	17 (100.0)	0 (0.0)	.128
Yes	193 (79.1)	51(20.9)	

The study found that the majority of respondents were aware of modern contraceptives, and over 70.0% believed that contraceptive use provided complete protection against pregnancy. This aligns with the Ghana Demographic and Health Survey [22], which notes universal awareness of contraceptives in Ghana, with 96.5% of married adolescents possessing some knowledge of modern contraceptive methods. Notably, condoms and pills were identified as the most recognized modern contraceptives, mirroring findings in a study by Sweya et al. [20].

Despite the high level of contraceptive knowledge among adolescents in our study, over 70.0% had never used modern contraceptives, and two-thirds (2/3) of the respondents were currently not using any. This is consistent with the argument made by Nyongesa & Odunga [23] that although awareness and knowledge about contraceptives are high among young people in Sub-Saharan Africa, this awareness does not necessarily translate into increased contraceptive use, resulting in a low contraceptive prevalence.

The study identified a significant association between the age of respondents and modern contraceptive use. A considerable percentage (90.5%) of respondents aged 15–17 years did not use contraceptives, compared to 69.5% of those aged 18–19 years. Furthermore, 30.5% of respondents between the ages of 18 and 19 said they used contemporary contraception. This result is in line with studies by Nyarko [11], Khan et al. [24], and Kayongo [4], all of which found a relationship between age and the usage of contemporary contraceptives.

Furthermore, the poll indicated that 34.0% of respondents selected short-term contraceptive methods, while 66.0% preferred long-term alternatives. Notably, 83.9% of the teenagers between the ages of 18 and 19 selected long-term methods of contraception. The findings

presented here concur with those of Mekonnen et al. [7], who highlighted the impact of age on the use of contemporary long-term contraceptives.

The usage of contemporary contraceptives and the respondents' educational status were also substantially correlated, confirming findings from Asiimwe et al. [25] in Uganda and Nyarko [11]. Teens' sexual partners, relationship status, and partnership consent have been shown to have a significant influence on how often they use modern contraception. These findings align with research conducted by Boamah et al. [26], Obare et al. [27], and Ngome & Odimegwu [28].

Consistent with research by Okech, Wawire, & Mburu [29], the study also highlighted the influence of religious affiliation and the positive attitude of health professionals on teens' use of modern contraception [30-32]. It emphasizes how crucial it is to educate teenagers about contemporary contraception and motivate them to use it to reduce their risk of contracting STDs, getting pregnant unintentionally, and other medical problems.

4. CONCLUSION AND RECOMMENDATION

The study shows that, even though they are aware of it, age, education level, and marital status have a substantial impact on teens' usage of contemporary contraception. Peer pressure, partner support, and unfavorable opinions from medical professionals are among the other factors that influence the usage of contraceptives. To ensure that teenagers have the greatest possible sexual and reproductive health, the research recommends a community-based strategy to enhance the use of contemporary contraceptives. This strategy should prioritize increasing use and removing barriers.

CONSENT AND ETHICAL APPROVAL

Before the study began, the District Health Administration (DHA) and the Regional Health Directorate (RHD) in the area under study were officially informed. The investigation's ethical standards were met by obtaining each respondent properly obtained written informed consent. Those under the age of eighteen were asked to have a guardian or parent sign or thumbprint on the consent form to be eligible for participation in the research effort.

Every step of the research process was explained to respondents, who were made aware that they might discontinue the study at any moment and that participation was entirely optional. It was underlined that complete anonymity, as well as confidentiality, would be ensured and that any data contributed to the study would be treated with extreme caution.

Throughout the actual data collection, the research team made sure to identify themselves, explain the goal of the study, and stress that participation in the study is completely voluntary. The objective of this ethical and open approach was to create a basis of confidence and guarantee the welfare and independence of the research subjects.

COMPETING INTERESTS

The authors have declared that no competing interests exist.

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