Original Research Article

Exploring Factors Influencing the Utilization of Modern Conceptive: A Cross-Sectional Study Among Adolescents in the Nabdan District, Upper East Region-Ghana

Comment [A1]: Contraceptive

.

ABSTRACT

Introduction: The promotion of contraceptive use among adolescents is important in enhancing adolescent sexual and reproductive health. The growing numbers of pregnant adolescents and the concomitant low use of modern contraceptives in the Nabdam district demonstrate that addressing adolescent sexual and reproductive health needs is critical. This study assesses the factors influencing modern contraceptive uptake in the Nabdam District in the Upper East Region of Ghana.

Methods: The study used a descriptive cross-sectional design with a quantitative approach. The study recruited 261 adolescent girls between the reproductive age of 15-19 years in the Nabdam district. A multi-stage sampling technique was used in selecting the study participants. The data was collected using a structured survey questionnaire for a period of ten (10) working days and the data was analyzed using STATA Version 14. Bivariate and logistic regression analyses were used to examine possible associations between outcome variables and independent variables with $p < .05$ indicating statistical significance.

Comment [A2]: Teenagers

Results: The study found that 52.1% of respondents have had sex before age 20 and the minimum age at first sex was 10 years whiles the maximum age at first sex was 19 years. The study revealed that 87.6% of respondents had heard of modern contraceptives through health workers, teachers, peers, and the media (radio). Seventy-eight (78.0%) of respondents have never used a contraceptive method and 42.1% of respondents indicated contraceptive use provided 100% protection from pregnancy. 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 affiliation ($p<.018$), sexual partner ($p<.001$), partner consent ($p<0.001$), positive attitude of health workers ($p<0.001$) and contraceptive availability ($p<.001$).

Comment [A3]: But age range of the respondents was 15-19 years

Conclusion: This study concludes that, increasing the usage of modern contraceptives will require a community-based approach with the aim of promoting the factors that promote usage and breaking the barriers.The GHS, through its School Health Education Program (SHEP), could improve activities by intensifying talks, organizing drama, and debates, and introducing peer educators as resource persons to share their experiences and educate their peers on their sexuality, reproductive health challenges, and usage of modern contraceptives.

Comment [A4]: This focused only on recommendations but did not speak to the key findings of this fine research.

Keywords: [Modern, Contraceptives, Utilization, Prevalence, Adolescents, Factors]

1. INTRODUCTION

The promotion of contraceptive use among adolescents is important in enhancing adolescent sexual and reproductive health [1]. It is estimated that unintended pregnancies would drop by 83%, from 18 million to 3 million and unsafe abortions would also decline by 84% from 5.7 million to 0.9 million if there is the provision of full modern contraceptives together with adequate health care (Organization, 2014). It is similarly estimated that maternal deaths would drop by 68% (from 183,000 to 58,000 per year) and newborn death would decline by 82% (from 1.2 million to 213,000) if there is the provision of full modern contraceptives together with adequate health care [2].

Studies in other parts of sub–Saharan Africa have examined contraceptive use among youth (15–24 years) and found that factors associated with contraceptive use among the youth included; limitedcontraceptive options, absences of counseling on contraceptive effectiveness, inconsistent supply of contraceptives, negative attitude of service providers, providers misconception toward young and unmarried peoples use of contraceptives as well as age, sex and marital status [3–6].

Another study carried out in southern Ethiopia by Mekonnen et al., [7] revealed that knowledge of contraceptives and the age of women had a significant association with the use of long-acting and permanent contraceptives. Also in Amhara Region in Ethiopia, a study showed that some determinants of modern contraceptive use by women were because of the involvement or consent of their partners [8].

In Ghana, the issue of low contraceptive use is also a public health challenge [5, 9]. The use of contraceptives among women in their reproductive age (15–49 years) currently stands at 23% [10]. Among married adolescents of age 15–19 years, the prevalence of contraceptive use is 19% GSS et al., [20]. However, 27% of currently married women and 45% of unmarried sexually active women aged 15–49 are using contraceptives [11]. Among married women, 22% are using modern contraceptives while 5% are using the traditional method [11]. There is however low usage (19%) among women between the age of 15–19 years [12].

A study conducted in Ghana by Nyarko, [13] on the prevalence and correlates of contraceptive use among female adolescents revealed that, factors such as adolescent age, marital status, religious affiliation, ethnicity, education, work status, visiting health facilities, and knowledge of ovulatory cycle significantly determined use of contraceptives by adolescents.

Globally, it has been recognized that contraceptive use allows women especially adolescent girls, to delay motherhood or childbearing, space births, or even put an end to childbearing [14]. The use of contraceptives also reduces unintended pregnancies and abortions [15]. Despite the benefits that could be derived from adolescents' use of modern contraceptives, few adolescents use modern contraceptives in low-income settings [16]. This is obvious in sub –Saharan Africa, where unplanned pregnancies and childbearing among adolescents continue to be of great concern [13]. According to Nyarko, [13], adolescents' sexual and reproductive health is highly seen as a moral issue in many communities of sub–Saharan African settings. Although in many regions of sub–Saharan Africa, there has been some improvement, there are still challenges related to access and knowledge of contraceptives among adolescents [17].

The Upper East region of Ghana is one of the regions where contraceptive uptake is an issue of concern. Among every 100 adolescents, there are three (3) births, and between 2012 and 2014, the region's adolescent pregnancy rate stood at 15%, which was higher than the national adolescents' pregnancy rate of 14%, though the region recorded a contraceptive prevalence rate (CPR) of 23.7% [11].

The Nabdam district has family planning programs that allow sexually active individuals and couples access to contraceptive services without considering age [18]. There is also the

---

Comment [A5]: 3.06million and not 3million please

Comment [A6]: 0.912 and not 0.9million please

Comment [A7]: Please reference this assertion properly.

Comment [A8]: 58,560 and not 58,000 please

Comment [A9]: 18% of 1.2 million = 216,000 and not 213,000. Please cross check.

school health program which carries out activities on adolescents' sexual and reproductive health to help address adolescents' reproductive health needs [19].

Despite all these interventions enrolled by the district, it still demonstrates some of the worse indicators of adolescent sexual and reproductive health. The district's TFR is 6.6, a rate higher than both the regional and national figures of 6.2 and 4.2 respectively [11]. The district recorded 244 (22.3%) adolescent pregnancies out of a total of 1096 antenatal care registrants in 2015 and 166 (32.1%) of a total of 517 ANC registrants by mid-year 2016 [18]. The district also recorded 122 (23.9%) adolescents (15–19years) out of a total of 511 contraceptive users in 2015 but in 2011 (mid-year), there was a very low proportion of contraceptive use in the district as 60 (15.4%) adolescents aged 15–19 years out of a total number of 389 contraceptive users [18]. The growing numbers of pregnant adolescents and the concomitant low use of modern contraceptives in the Nabdam district demonstrate that, addressing adolescent sexual and reproductive health needs is critical. It is against this background that this study assesses the factors influencing modern contraceptive uptake in the Nabdam District in the Upper East Region of Ghana.

2.METHODOLOGY

2.1 Study Area

The Nabdam District shares boundaries with Bongo District to the North, Talensi District to the South, to the East with the Bawku West District, and the West is Bolgatanga Municipality all in the Upper East Region.

The district has a total land area of 244.94km with a total population of 33,826 representing 3.2% of the regional population. The proportion of males to females in the district is 16,871 (49.9%) and 16,955 (50.1%) respectively of which adolescents form 14,105 (41.7%) of the total population [20]. The inhabitants of this district are predominantly farmers, forming 85.9% of the total population, and are engaged in the cultivation of crops, rearing of animals, and planting of trees (GSS et al., 2014).

> **Comment [A10]:** Reference this properly please

The district has two health centers, two clinics, and 13 CHPS centers. The services provided in these facilities included outpatient departments (OPD), antenatal care and postnatal care (PNC), laboratory, nutrition, family planning, and ultra-scan services[18].

2.2 Study Design

The study design that was adopted for this study was a cross-sectional study using the quantitative approach. A cross-sectional study is carried out at one point in time or over a short period to estimate the prevalence of the outcome of interest of a given population[21]. As this study focused on examining factors influencing the use of modern contraceptives among adolescents, this design was appropriate as it enabled the collection of data on individual characteristics at the time of the study together with information about the dependent variable as well as the association of individual characteristics and the outcome (dependent) variable. This involved thecollection of quantitative data from femaleadolescents aged 15–19 years in the Nabdam district of the Upper East Region, Ghana.

> **Comment [A11]:** Not necessary, please delete. I recommend that the study design and study population should be joined together as same heading.

2.3 Study Population and Unit

The study focused on adolescent girls with the reason being that it is the age most adolescents become sexually active and as well experience challenges such as adolescent pregnancy and its related consequences.

2.3.1 Inclusion Criteria

Adolescent girls within the Nabdam District. ~~in and around school adolescents, those married and unmarried were included in the study.~~

2.3.2 Exclusion Criteria

~~An adolescent who was not within the selected sub-district under the study,~~ ~~A~~an adolescent who was not mentally sound was not considered, an adolescent who was not willing to take part was not included~~.~~, ~~and a male adolescent.~~

2.4 Sample Size

The estimated adolescent population of the district is 14,105 (i.e., 41.7% of the total population of 33,826). Considering the large adolescent population size, a sample was drawn from the population to make an inference about the adolescent population. To determine an appropriate sample size for the study, Cochran [22] formula was used and the formula is denoted by:

$n = z^2 pq / d^2$; Where; n = sample size required, z = the value for the given confidence interval, d= margin of error, p = population proportion (prevalence of the outcome of interest), and q = 1 – p

In determining this, a 95% confidence interval and a 5% margin of error were used. The prevalence of contraceptive use among adolescents aged 15 – 19 years in Ghana is 19% [11].

Hence, the sample size was determined as = 236.5

n = 237

To account for non-response, a 10% upward adjustment was made. Therefore, 10% of 236.5;

237*(0.10) = 24, the final total sample size therefore was 237 + 24 = 261 adolescents.

2.5 Sampling Technique

There were five (5) sub-districts within the Nabdam District Health Administration (DHA). But for the sake of time, resources, and the purpose of this study, only one sub-district was considered in this study. A multi-stage sampling technique was used in selecting the study participants. First, a simple random sampling technique (by balloting) was used to select a sub-district from a total of five. This was done by giving each sub-district a number, (i.e., 1–5). These numbers were then written on pieces of paper and kept in a bowl. At random, one piece of paper was selected and the sub-district corresponding to the selected number was the one within which the study was carried out, thus, Kongo–the Pitanga sub-district. Second, a simple random sampling technique was employed to select the number of houses to be included in this study. There was data already specifying the number of houses and houses numbered within the sub-district. Based on this information an electronic or computer-based number generator was used to randomly select 261 houses for the study.

The third stage involved the selection of participants in houses with only one household with only one adolescent who met the inclusion criteria, that household was considered. However, where there was more than one adolescent in the selected household, a simple random sampling technique was used to select only one adolescent. This was done by giving each adolescent a number (e.g., 1–3). These numbers were then written on pieces of paper, folded, and kept in a bowl. At random, one piece of paper was selected and the adolescent corresponding to the selected number was included in the study. Also, where there was more than one household with adolescents who met the inclusion criteria, a simple random sampling technique (similar to the one described above) was used. Finally,

where no adolescent in the selected house who met the inclusion criteria, the house was replaced with the next house.

2.6 Study Variables and Data Sources

The dependent or outcome variable in the study was modern contraceptive use. Modern contraceptive use referred to the use of any of the following methods, female condoms, pills, injectables, implants, female sterilization, lactational amenorrhea method (LAM), and intrauterine device (IUD).
The independent variables are the individual, health service, and societal factors. The individual factors included age, educational level, religious affiliation and marital status whereas the health service factors constituted the attitude of service providers, available service points (adolescent health corners), and available varied modern contraceptives. Societal factors included influence from parents, peer influence, religious beliefs and practices, partners' consent, and public perception of adolescent users of contraceptives.

2.7 Instruments for Data Collection

The data collection tool that was used in this study was a structured survey questionnaire. The questionnaire was developed and used to collect data from adolescents. The questionnaire contained both closed and open-ended questions with spaces for explanation where it was required. The questions and structuring of the questionnaire were informed by findings from reviewed literature[15, 23]. The questionnaire was designed in English but was administered in both English and the local dialect. This enabled adolescents who did not speak English to understand and appropriately and comfortably respond to the questionnaire.

2.8 Data Collection Procedure

The data was collected with the help of five research assistants who were university graduates living in the district. The research assistants were trained with focused on the objectives of the study, and also how to obtain consent/assent from study participants or their parents/guardians (thus, for those who were below 18 years). They were also taken through community entry, building rapport, assurance of privacy and confidentiality, interpretation of items of measure, and the correct ticking of responses that were provided. The research team together with the trained five research assistants used ten (10) working days for the data collection.

2.9 Data Entry and Cleaning

Data were entered into a computer and stored in a folder with a password that could only be assessed by the researchers. Prior to entering, the data were cleaned by ensuring the completeness and proper numbering of the questionnaires.

2.10 Data Management and Analysis

Administered questionnaires were cleaned, coded, and entered using Epi info version 3.5.1. The data was exported to STATA Version 14. Descriptive statistical analysis (mean, median, and standard deviation) was performed to first describe the characteristics of study participants and other variables. Bivariate and logistic regression analyses were used to examine possible associations between outcome variables and independent variables. A

chi-square analysis was done to identify the possible association between the outcome variable and relevant independent variables. Statistical significance was held at p = .05.

2.11 Ethical Considerations

Consent for permission was sought and obtained from the Regional Health Directorate (RHD) and District Health Administration (DHA) within the study area. Informed written consent was sought from all respondents and those who were below 18 years, an assent was sought from their parents/guardians either by signing or thumb printing on the form. Respondents were made to understand that participating in the research was entirely voluntary and therefore they were at liberty not to continue in the study at any point in time. Respondents were assured of strict anonymity and confidentiality on any information they gave during the research. At any point during the data collection, the research team introduced themselves and explained the objectives of the study to the respondents before data was collected.

3. RESULTS AND DISCUSSION

3.1 Socio-Demographic Characteristics

All respondents were between the ages of 15 to 19 with a mean age of 16.7 years (SD ±1.4) years. The majority of the respondents were between the ages of 17–19 years (51.3%). The majority of the respondents (63.6%) had Junior High School (JHS) as their highest educational level at the time of this study, 92% were Christians, and over 80.0% have never been married whilst 73.2% lived with their parents. Concerning the educational attainment of the respondents' parents/guardians, 78.5% and 75.5% of respondents reported that their fathers and mothers respectively had no formal education as shown in table 1 below.

Table 1: Socio-Demographic Characteristics of Respondents (n=261)

Characteristics	Frequency (N)	Percentage (%)
Age (years)		
Mean ± SD	16.7±1.4	
Level of education		
No formal education	17	6.5
Primary	51	19.5
J. H. S	166	63.6
S. H. S	27	10.3
Religious affiliation		
Catholic	132	50.6
Charismatic	76	29.1
Muslims	12	4.6
Traditionalist	21	8.0
Others	20	7.7
Marital status		
Married	45	17.2
Single	216	82.8
Who do you live with		

Living with parents	191	73.2
Courting	46	17.6
Living with guardian	24	9.2
Father's education		
Uneducated	205	78.5
Primary	40	15.3
J. H. S	5	1.9
S. H. S	7	2.7
Tertiary	4	1.5
Mother's educational level		
Uneducated	197	75.5
Primary	34	13.0
J. H. S	21	8.0
S. H. S	7	2.7
Tertiary	2	0.8

J.H. S= Junior High School, S.H.S.= Senior High School

3.2 Sexual Behaviour Among Adolescents

The study showed that, the mean age at first sex was 15.8 years (SD ±1.4). Nearly half (49.8%) of the respondents currently have a sexual partner(s). Out of this number (49.8%) who currently have a sexual partner(s), 87.5% of them reported that they have had only one (1) sexual partner. Only 5.7% indicated they had sex while drunk, 26.7% felt pressurized to have sex, and 82.0% felt sex education can influence contraceptive usage. Majority of the respondents (75.1%) indicated that, they had sex education from school and half 50.0% of the respondents had sex education from home as illustrated in Table 2.

Table 2: Sexual Behaviour Among Adolescents

Characteristics	Frequency (N)	Percentage (%)
Ever had sex		
Yes	136	52.1
No	125	47.9
Age at first sex		
Mean ± SD	15.8years (SD ±1.4)	
Condom or any contraceptive use at first sex		
Yes	41	30.1
No	95	69.9
Contraceptive use at last sex		
Yes	61	44.9
No	75	55.1
Number of sexual partners		
0	131	50.2
1	119	45.6

2	9	3.4
3	2	0.8
Had sex while drunk		
Yes	15	5.7
No	246	94.3
Use of contraceptives while drunk		
Yes	5	33.3
No	10	66.7
Feel pressurized to have unprotected sex		
Yes	68	26.1
No	193	73.9
A person from whom pressure came from		
Partner	61	89.7
Relatives	6	8.8
Peers	1	1.5
Sex education can influence modern contraceptive use		
Yes	214	82.0
No	47	18.0
Had sex education from home		
Yes	130	49.8
No	131	50.2
Had sex education at school		
Yes	196	75.1
No	65	24.9

3.3 Awareness and Knowledge of Modern Contraceptives

Table 3 presents respondents' awareness and knowledge of modern contraceptives. The majority (69.0%) of respondents had ever heard about contraceptives. Major sources of their information included, teachers (46.7%), radio (21.7%), and health workers (15.6%). Out of the (180) respondents who had ever heard about contraceptives (82.8%) of them knew about modern contraceptive methods.

The most known modern contraceptives included injectables (27.5%), pills (26.8%) and female condoms (26.9%). Among these 149 respondents, (96.6%) knew where to get these modern contraceptives with clinics (48.3%), drug stores (21.5%), family planning clinics (14.1%) as the sources of these modern contraceptives.
More than two thirds (71.1%) of the respondents indicated that modern contraceptive usage provide 100% protection from pregnancy whilst (69.7%) believe that, the use of contraceptives is not the decision of the woman alone to make and (52.5%) of women who use modern contraceptives are considered to be promiscuous.

Table 3: Awareness and Knowledge of Modern Contraceptives

Characteristics of respondents	Frequency	Percentage (%)
Ever heard about contraceptives		
Yes	180	69.0
No	81	31.0
Source of information		
Teachers	84	46.7
Radio	39	21.7
Health worker	28	15.6
Peers	25	13.9

Partner	18	10.0
Print media	6	3.3
Others	2	1.1
Know of modern contraceptive methods		
Yes	149	82.8
No	31	17.2
Modern contraceptives methods you have heard about (n = 149)		
Injectables	41	27.5
Pills	40	26.8
Female condom	40	26.9
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 specific place to get 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	2.0
Family members	1	0.7
The use of contraceptives is the decision of the woman		
Yes	79	30.3
No	182	69.7
Women who use modern contraceptives are promiscuous		
Yes	137	52.5
No	124	47.5

3.4 Modern Contraceptive Use Among Adolescents

Table 4 shows the modern contraceptive prevalence among the adolescents surveyed. The majority of the respondents (72.9%) indicated they have never used any modern contraceptive. The contraceptive method that was reported to be used by majority (46.4%) of respondents was pills, followed by injectables (31.9%) and female condoms (14.5%) with the least used method being implants (1.4%).

It was noted that, in terms of respondents currently using modern contraceptives, the majority (78.0%) of them reported not using any contraceptive method leaving only (22%) currently using modern contraceptive. Major methods currently in used included pills (39.6%) injectables (31.9%) and female condoms (14.5%). Concerning why they would use a modern contraceptive, some of the responses reported included to avoid pregnancy (48.7%), delay childbirth (37.9%), prevent STIs (12.3%), and space birth (1.1%).

Table 4: Modern Contraceptive Use Among Adolescents

Characteristics	Frequency	Percentage (%)
Ever used any modern contraceptive		
Yes	69	27.1
No	186	72.9

Methods used before

Pills	32	46.4
Injectables	22	31.9
Female condom	10	14.5
IUD	4	5.8
Implants	1	1.4

Currently using a modern contraceptive method

Yes	57	22.0
No	202	78.0

Methods currently used

Injectables	21	39.6
Pills	21	39.6
Female condom	5	9.4
IUD	4	7.5
Implants	3	5.7
LAM	2	3.8
Others	1	1.9

A place to get contraceptives in the community

Clinic	192	73.6
Health worker	86	33.0
Drug store	83	31.8
Family planning clinic	50	19.2
Partner	8	3.1
Peers	7	2.7

Reason for modern contraceptive use

Avoid pregnancy	127	48.3
Delay childbirth	99	37.9
Prevent STIs	32	12.3
Others (space birth)	3	1.1

Considering whether respondents were using short or long-term contraceptive methods, 45.6% used short-term methods whiles 54.4% used long-term methods (Figure).

fig.1 Types of modern contraceptives

Long term contraceptive users 54%

Short term contraceptive users 46%
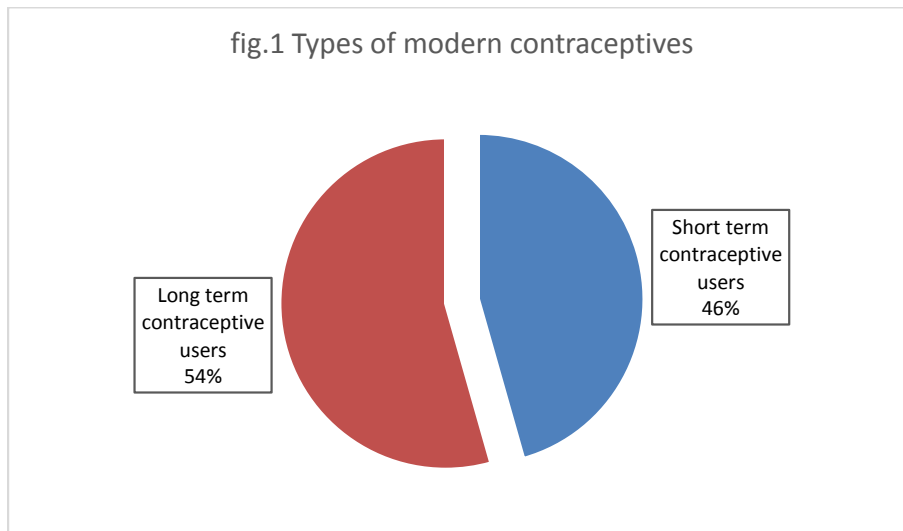
3.5 Factors Influencing Adolescents Use of Modern Contraceptives

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 affiliation ($p<.018$), sexual partner ($p<.001$), partner consent ($p<.001$), positive attitude of health workers ($p<.001$), contraceptive availability ($p<.001$). However, factors such as knowledge of contraceptives and health service points had no significant association with contraceptive use.

Table 5: Factors Influencing Modern Contraceptive Usage by Adolescents'

Variables	Contraceptive use, n (%)		p-value
	No	Yes	
Age group			
14 –16	114 (90.5)	12 (9.5)	.000
17 –19	92 (69.2)	41 (30.8)	
Educational level			
Uneducated	7 (41.2)	10 (58.8)	.000
Primary	38 (76.0)	12 (24.0)	
J. H.S	141 (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	183 (85.5)	31 (14.5)	
Knowledge of place			
No	5 (4.9)	97 (97.0)	.166
Yes	0 (0.0)	53 (53.0)	
Stayed with			
Parents	161 (85.2)	28 (14.8)	.000
Guardian	21 (87.5)	3 (12.5)	
Partner	24 (52.2)	22 (47.8)	
Religious affiliation			
No	150 (76.5)	46 (23.5)	.018
Yes	56 (90.3)	6 (9.7)	
Knowledge of contraceptive usage			
No	100 (77.5)	29 (22.5)	.423
Yes	106(81.5)	24(18.5)	
Peer influence			
No	83 (40.5)	122 (59.5)	.001
Yes	8 (15.4)	44(84.6)	
Have a sexual partner			
No	127 (99.2)	1 (0.8)	.000
Yes	79 (60.3)	52 (39.7)	
Partner consent			
No			
Yes			
A positive attitude of Health workers			
No	50 (96.2)	2 (3.8)	.000
Yes	155 (75.6)	50 (24.4)	
Availability of Contraceptive			
No	40 (97.6)	1 (2.4)	.001
Yes	164 (76.3)	51 (23.7)	
Available service points influence contraceptive use			
No	11 (100.0)	0 (0.0)	.128
Yes	193 (79.1)	51(20.9)	

3.6 Discussions

This study aims at assessing the factors influencing adolescents 'usage of Modern contraceptives in the Nabdam district. Previous research has shown that many adolescents

~~have~~ had sex before their 20th birthday and such can be found in a study by Ramjee & Daniels, [24], which suggests that 75% of adolescents in Sub–Sahara Africa have had sex by age twenty. Similarly, the findings of this study demonstrate that 52.1% of respondents have had sex before the age of 20 and the minimum age at first sex was 10 years whiles the maximum age at first sex was 19 years.

The study revealed that 69.0%of respondents had heard of modern contraceptives and 71.1% of respondents indicated contraceptive usage provided 100% protection from pregnancy. This finding aligns well with the GDHS [25], which states that, knowledge of contraceptives is universal in Ghana and that 96.5% of married adolescents aged 15–19 years have some form of knowledge about a method of modern contraceptives. It was also noted that, condoms and pills were among the most known modern contraceptives. This finding tally with a study by Sweya et al,. [23] which showed that contraceptive knowledge among female adolescent undergraduates in Kilimanjaro–Kenya was high with 78% familiar with male condoms while 60.4% reported having heard about the pill.

Irrespective of the elevated level of knowledge of modern contraceptives among adolescents in this study, 72.9% and 78.0% of respondents have never used and were currently not using a modern contraceptive method respectively. This is consistent with a study by Nyongesa &Odunga, [26] who argue that there is abundant information that contraceptive knowledge and awareness are high among young people in Sub-Saharan Africa population yet this awareness has not translated into increased contraceptive use, with the result being very low contraceptive prevalence.

The age of respondents was significantly associated with modern contraceptive use. A remarkably high percentage of respondents (90.5%) aged 14–16 years did not use contraceptives compared to 69.5% of respondents aged 17–19 years who did not use any contraceptive while 30.5% of respondents aged 17–19yrs used a modern contraceptive. This is also consistent with a study by Kayongo, [4] which found that, age was associated with modern contraceptive use. Also, in other studies carried out by Khan et al.,[27] and Nyarko, [13], it was reported that the age of respondents was significantly associated with modern contraceptive use by adolescents.

The present study also revealed that 45.6% of respondents used short-term methods whiles 54.4% used long-term methods. It is obvious from this that, majority (83.9%) of adolescents aged 17–19 years used long-term contraceptive methods compared to respondents aged 14–16 years. This is consistence with the findings by Mekonnen et al., [7] which stated that the age of women significantly influences the use of long-term modern contraceptives.

The educational status of respondents was significantly associated with adolescents' usage of modern contraceptives. This is also in consonance with the findings of Asiimwe et al., [28] in Uganda where they found that the educational level of the respondent was significantly associated with the use of modern contraceptives among women. Nyarko, [13] also reported that, the educational level of adolescents is significantly associated with modern contraceptive use. In this study, partner consent was found to be significantly associated with modern contraceptive use among adolescents. This is also in agreement with other studies such as that of Boamah et al., [29] and Obare et al., [30]. The studies have reported that, adolescents' use of modern contraceptives was significantly associated with discussions with their partner and that the approval of the partner was associated with contraceptive use. The marital status of respondents was another measure that was significantly associated with the use of modern contraceptives by adolescents. This is related to studies done by Ngome &Odimegwu, [31], which indicated that characteristics such as marital status influenced the use of modern contraceptives by adolescents. Findings from the study also showed that adolescents with sex partners were more likely to use modern contraceptives compared to those who had no sex partners. This finding is similar to the study by Obare et al., [30], who observed that adolescents who had recent sex (sexual partners) were more likely to use modern contraceptives compared to those who had no sex partners (had not had sex in recent time). The current study equally reported that the

Comment [A14]: What could be responsible for this trend in the studied district. Try to let us know if such factors are also similar to the ther african settings studied in the quoted reference.

religious affiliation of respondents and the positive attitude of health workers influenced adolescents' use of modern contraceptives and this can also be found in a study by Okech, Wawire, & Mburu, [32], who identified religious affiliation and the friendliness (positive attitude) of service providers to significantly influence modern contraceptive use. As a result, it is important that such persons provide adolescents precisely with the right information about modern contraceptives and encourage them to use them (modern contraceptives) to avoid or prevent STIs including HIV/AIDS, unplanned pregnancy and even death in the worse situations (abortion).

4. CONCLUSION

Comment [A15]: This is better and more encompassing than the summary in the Abstract

Although majority of respondents have heard about modern contraceptives and know about modern contraceptive methods, the prevalence of modern contraceptives was low. Some of the factors such as age, educational status, and marital status of adolescents were significantly associated with modern contraceptive use. Other related factors such as peer influence, partner consent/support, and negative attitude of health workers influenced the use of modern contraceptives. This study, therefore, concluded that increasing the usage of modern contraceptives will require a community-based approach with the aim of promoting the factors that promote usage and breaking the barriers, hence, facilitating modern contraceptive usage, and fostering healthy adolescent sexual and reproductive health.

5. RECOMMENDATIONS

The GHS, through its School Health Education Programme (SHEP), could improve activities by intensifying talks, organizing drama, and debates, and introducing peer educators (who have been victims of teenage pregnancy) as resources persons to share their experiences and educate their peers on their sexuality and reproductive health challenges.
Also, the GES should intensify education on adolescent sexual and reproductive health rights from upper primary through to senior high school level while the GHS should intensify education on modern contraceptive use, sexual and reproductive health challenges of the adolescent in school and those out of school through outreach programs, mother to mother support group discussions and durbars.
GES and GHS should plan and develop positive behaviour change programs through drama, introducing the mentor and mentee concept and using peer educators resource persons to facilitate during programs. These are some of the ways that could excite and motivate adolescents to cultivate the habit of living responsible and healthy sexual lifestyles including contraceptive use. This could help curb or prevent infection and the spread of STIs and HIV/ AIDS.

CONSENT

An informed written consent was sought from all respondents and those who were below 18 years, an assent was sought from their parents/guardians either by signing or thumb printing on the form.

REFERENCES

[1]   Hagan JE, Buxton C. Contraceptive knowledge, perceptions and use among adolescents in selected senior high schools in the central region of Ghana. *J Sociol Res* 2012; 3: 170–180.
[2]   World Health Organization. Eliminating forced, coercive and otherwise involuntary

sterilization: an interagency statement, OHCHR, UN Women, UNAIDS, UNDP, UNFPA, UNICEF, and WHO.

[3]   Dougherty A, Kayongo A, Deans S, et al. Knowledge and use of family planning among men in rural Uganda. *BMC Public Health* 2018; 18: 1–5.

[4]   Kayongo SB. Uptake of modern contraception among youths (15-24) at the community level in Busia District, Uganda. *Unpubl Master's Thesis) Makerere Univ Sch Public Heal Kampala, Uganda*.

[5]   Oppong FB, Logo DD, Agbedra SY, et al. Determinants of contraceptive use among sexually active unmarried adolescent girls and young women aged 15–24 years in Ghana: a nationally representative cross-sectional study. *BMJ Open* 2021; 11: e043890.

[6]   Ajah LO, Onubogu ES, Anozie OB, et al. Adolescent reproductive health challenges among schoolgirls in southeast Nigeria: Role of knowledge of menstrual pattern and contraceptive adherence. *Patient Prefer Adherence* 2015; 9: 1219–1224.

[7]   Mekonnen G, Enquselassie F, Tesfaye G, et al. Prevalence and factors affecting the use of long-acting and permanent contraceptive methods in Jinka town, Southern Ethiopia: a cross-sectional study. *Pan Afr Med J*; 18.

[8]   Mohammed A, Woldeyohannes D, Feleke A, et al. Determinants of modern contraceptive utilization among married women of reproductive age group in North Shoa Zone, Amhara Region, Ethiopia. *Reprod Health* 2014; 11: 1–7.

[9]   Mutaru A-M, Asumah M, Ibrahim M, et al. Knowledge of Sexually Transmitted Infections (STIs) and sexual practices among Nursing Trainees in Yendi Municipality, Northern Region of Ghana. *Eur J Heal Sci* 2021; 6: 33–47.

[10]   Ameyaw EK. Prevalence and correlates of unintended pregnancy in Ghana: Analysis of 2014 Ghana Demographic and Health Survey. *Matern Heal Neonatol Perinatol* 2018; 4: 1–6.

[11]   GSS, GHS, ICF. *Ghana Demographic and Health Survey 2014*. Accra, 2015.

[12]   Ghana Statistical Service (GSS) ICF International GHS (GHS). Ghana demographic and health survey 2014. *Rockville, Maryland, USA GSS, GHS, ICF Int*.

[13]   Nyarko SH. Prevalence and correlates of contraceptive use among female adolescents in Ghana. *BMC Womens Health* 2015; 15: 1–6.

[14]   Finer LB, Philbin JM. Sexual initiation, contraceptive use, and pregnancy among young adolescents. *Pediatrics* 2013; 131: 886–891.

[15]   Abondomah AR, Christabel Adimazoya L, Irene Adumbire A, et al. Factors Influencing the Utilization of Contraceptives among Adolescents in the Tamale Metropolis, Ghana. *Asian J Med Heal* 2022; 56–68.

[16]   World Health Organization. Fact Sheets: Family Planning in SSA.

[17]   UNICEF. *Opportunity in Crisis: Preventing HIV from early adolescence to young adulthood.* UNICEF, 2011.

[18]   Nabdan District Health Directorate. Family planning consumption.

[19]   Abdul-Wahab I, Nungbaso AM, Nukpezah RN, Dzantor EK. Adolescents sexual and reproductive health: a survey of knowledge, attitudes, and practices in the Tamale Metropolis, Ghana. Asian Res J GynaecolObstet. 2021;6(1):31–47.

[20]   Ghana GSS. Population and housing census: national analytical report. *Accra-Ghana Ghana Stat Serv* 2010; 2013.

[21]   Levin KA. Study design III: Cross-sectional studies. *Evid Based Dent* 2006; 7: 24–25.

[22]   Snedecor GW, Cochran WG. Statistical methods, 8thEdn. *Ames Iowa State Univ Press Iowa* 1989; 54: 71–82.

[23]   Sweya MN, Msuya SE, Mahande MJ, et al. Contraceptive knowledge, sexual behavior, and factors associated with contraceptive use among female undergraduate university students in Kilimanjaro region in Tanzania. *Adolesc Health Med Ther* 2016; 109–115.

[24]   Ramjee G, Daniels B. Women and HIV in sub-Saharan Africa. *AIDS Res Ther* 2013;

10: 1–9.

[25]   GSS G and II. GSS GHS, ICF International. Ghana demographic and health survey 2014. Rockville:

[26]   Nyongesa P, Odunga J. Contraceptive Use in Sub-Saharan Africa: The Sociocultural Context. *Int J Public Heal Res* 2015; 3: 336–339.

[27]   Khan M, Hossain ME, Hoq MN. Determinants of contraception use among female adolescents in Bangladesh.

[28]   Asiimwe JB, Ndugga P, Mushomi J, et al. Factors associated with modern contraceptive use among young and older women in Uganda; a comparative analysis. *BMC Public Health* 2014; 14: 1–11.

[29]   Boamah EA, Asante KP, Mahama E, et al. Use of contraceptives among adolescents in Kintampo, Ghana: a cross-sectional study. *Open Access J Contracept* 2014; 5: 7–15.

[30]   Obare F, van der Kwaak A, Birungi H. Factors associated with unintended pregnancy, poor birth outcomes and post-partum contraceptive use among HIV-positive female adolescents in Kenya. *BMC Womens Health* 2012; 12: 1–8.

[31]   Ngome E, Odimegwu C. The social context of adolescent women's use of modern contraceptives in Zimbabwe: a multilevel analysis. *Reprod Health* 2014; 11: 1–14.

[32]   Okech TC, Wawire NW, Mburu TK. Contraceptive use among women of reproductive age in Kenya's city slums.

Comment [A16]: References 7, 27 and 32 is incomplete. Please complete them accordingly.

Comment [A17]: Et al is used after the 6th author in the Vancouvre referencing system. Please correct this through out the references.

Comment [A18]: Incomplete references in 2, 12, and 17. Please indicate the source and when it was last refrenced by your research group