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Determinants of "Sexo-Reproductive" Health Needs of Adolescent Girls in the Kumbo West Health District of Cameroon

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Abstract

Background: The sexo-reproductive health of adolescent girls is a public health issue.

Objectives: The aim of this study was to examine factors associated with comprehensive categories of adolescent girls' sexo-reproductive health needs.

Methods: This was a cross sectional study among adolescent girls (target population) carried out from April to May 2018 in the Kumbo West Health District. We used a two-stage cluster sampling design followed by a systematic random sampling technique to select participants.

Results: A total of 1525 adolescent girls with mean age 15.6 (SD=2.20) participated in the study. Participants relied on school teachers (66.6%), mothers (27.3%), and sisters (25.1%) for information on sexo-reproductive health. The odds of reporting ever having had sex were lower among participants who had a higher number of years expected to continue schooling (AOR: 0.59; 95% CI: 0.34-0.95), not being job seekers (AOR: 0.53; 95% CI: 0.29-0.97), being Muslims (AOR: 0.03; 95% CI: 0.01-0.07) and living with nuclear family (AOR: 0.35; 95% CI: 0.17-0.70). Mean

age of sexual debut was significantly lower among participants who had never worked for payment (t=2.931, p=0.004), living in a nuclear family (t=3.94, p<0.001) and having consumed alcohol in the last 30 days (t=-4.77, p<0.001). Proportion of participants who reported been sexually attracted to persons of the same sex was 10.82% (95% CI: 8.4-14.5) with 6.48% (95% CI: 3.9-8.2) reported having had sexual contact with persons of the same sex. Those who have had <2 sexual partner in the past 12 months were 0.17 times less likely to have correct knowledge on contraceptive methods compared to those with ≥ 2 sexual partners. The proportion of participants reporting ever been forced to have sex was 13.06% (95% CI: 10.95-15.52). Also, participants reporting ever having a "one night stand" and having sex in exchange of gift and money were 1.9% (95% CI: 1.17-3.08) and 1.19% (95% CI: 0.64 2.19) respectively.

Conclusion: This study has explored current sexo-reproductive health determinants among adolescent girls and to address any barriers, a Mhealth sexo-reproductive health scheme that takes into account local socio-cultural contexts is urgently needed.

Keywords: Sexo-Reproductive Health; Determinants; Adolescents girls; Cameroon

Abbreviations: PS-RHNAG-Predictors of "Sexo-Reproductive" Health Needs of Adolescent Girls; HIV-Human immunodeficiency Virus; STI-Sexually transmitted Infection; SRH-Sexo-reproductive Health; RATS-Relevance, Appropriateness, Transparency and Soundness; WHO-World Health Organization

1. Introduction

Adolescent girls in sub-Saharan Africa face various sexo-reproductive health risks such as unplanned pregnancy and sexually-transmitted infections (STIs), including HIV [1]. Adolescent girls are less likely than older women to access sexo-reproductive health care, including modern contraception and skilled assistance during pregnancy and childbirth [2, 3]. Many are poor, have little control over household income, have limited knowledge about sexo-reproductive health issues, and lack the ability to make independent decisions about their health [2, 4]. Moreover, they often do not have access to health care that meets their specific sexo-reproductive health needs. Most importantly, adolescent girls sexo-reproductive health needs often go unnoticed or are viewed through the lens of religious and cultural values, which in turn limit the possibility to provide highly needed care [5, 6]. Complications in pregnancy and childbirth are the leading causes of death among adolescent girls aged 15-19 in low- and middle-income countries, resulting in thousands of deaths each year [3]. As a result of unwanted pregnancies among adolescent girls, each year almost 3 million girls aged 15-19 years undergo unsafe abortions, often administered by unskilled providers [7], resulting a times in mortality. The need for high-impact adolescent sexo-reproductive healthcare programs has become a primary concern for global health organizations such as the World Health Organization (WHO) and the United Nations [8]. Sexo-reproductive education is related to many other markers of health and well-being, including maternal and child health, extreme poverty and gender equality. Therefore, it has become the focus of many youth health advocacy programs.

There is an urgent need to increase investment in comprehensive programmes, including sexo-reproductive health care for adolescent girls in Sub-Saharan African countries with Cameroon inclusive [9]. Doing so would yield multiple benefits, enabling girls to stay healthy, avoid unintended pregnancies, finish an education, engage in productive work, and choose to have fewer and healthier babies, when they are ready. Moreover, recent studies have shown that to address these adolescent sexo-reproductive health barriers, a comprehensive and harmonised sexo-reproductive health system that is youth friendly and takes into account local socio-cultural contexts is needed [1]. Adolescent girls' sexo-reproductive unmet health needs remain a major contributor to maternal and child mortality, and to the cycle of ill-health and poverty [3]. Few studies have been carried out in Cameroon to explicitly establish the epidemiological determinants associated with adolescent sexo-reproductive health needs that is, clearly showing where there are unmet adolescent sexo-reproductive health needs for an evidence based public health intervention to be developed and implemented. We therefore sought in this study to examine factors associated with comprehensive categories of adolescent girls sexo-reproductive health, including sources of information on sexo-reproductive health, puberty and relationships; risky sexual behaviors; age of sexual debut; homosexual behaviours; ever-use of contraceptive methods; HIV/AIDS and sexually transmitted diseases; sexual consent and gender-based violence; as well as utility and perception of sexo-reproductive health services.

1.1 Operational definition of terms

1.1.1 "Sexo-reproductive" health: This is a state of complete physical, mental and social well-being in all matters relating to the reproductive system such that, people are able to have a satisfying and safe sex life, the capability to reproduce, and the freedom to decide if, when, and how often to do so.

1.1.2 "Sexo-reproductive" health need: This is the accurate information and the safe, effective, affordable and acceptable contraception method of one's choice such that they must be informed and empowered to protect themselves from sexually transmitted infections and poor reproductive outcomes. And when they decide to have children, women must have access to services that can help them have a fit pregnancy, safe delivery and healthy baby.

1.1.3 Adolescent: Adolescence, according to WHO refers to the period between the ages of 10 and 19 years in which the individual progresses from the initial appearances of secondary sexual characteristics to full sexual maturity and during which psychological and emotional processes develop from those of a child to those of an adult.

1.1.4 Determinant: A determinant is any factor or variable that can affect the frequency of a disease or health outcome in a specific population. Determinants can be classified as either intrinsic or extrinsic.

2. Methods

2.1 Study design

This was a cross sectional study among adolescent girls aged 10-19 years; carried out in April 2018 in the Kumbo West Health District, a semi-urban/rural community composed of eleven health areas. Figure 1 that shows a health map of the Kumbo West Health District. The study involved community mobilization. In this survey, we used a two-stage cluster sampling design (Figure 2). The sample size was determined in consideration of analysis according to population statistical model of the Population Division of the United Nations [10]. The Kumbo West Health District has an adolescent girl's population of over 25120. The 1525 participants were obtained via probability proportionate to size, see Table 1.

2.2 Study area

This study was specifically carried out in six randomly selected health areas of the Kumbo west Health district namely Banso Baptist Hospital-BBH, Kikaikelaiki, Kitiwum, Kumbo_CMA, Kumbo_Urban and Melim. Kumbo, also known as Kimbo, is the second-largest city in the North West region of Cameroon and the capital of Bui Division. Kumbo is split into three distinctive hilly settlements of Tobin, Mbveh, and Squares [11]. The town is known for horse racing (Tobin Stadium) and traditional medicine, and also for its palace (Nso Palace), a market and two big hospitals (Shisong Hospital and Banso Baptist Hospital).

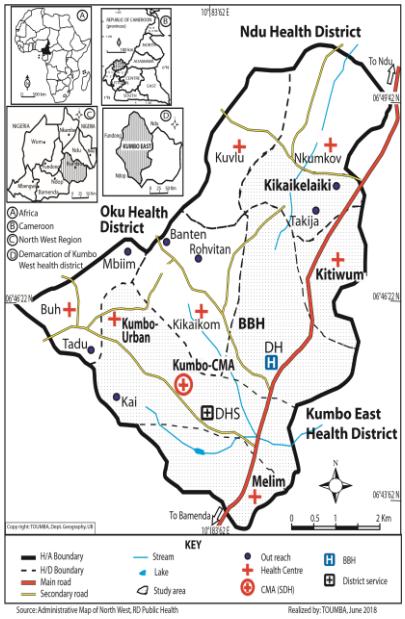

Figure 1: Map of the Kumbo West Health District.

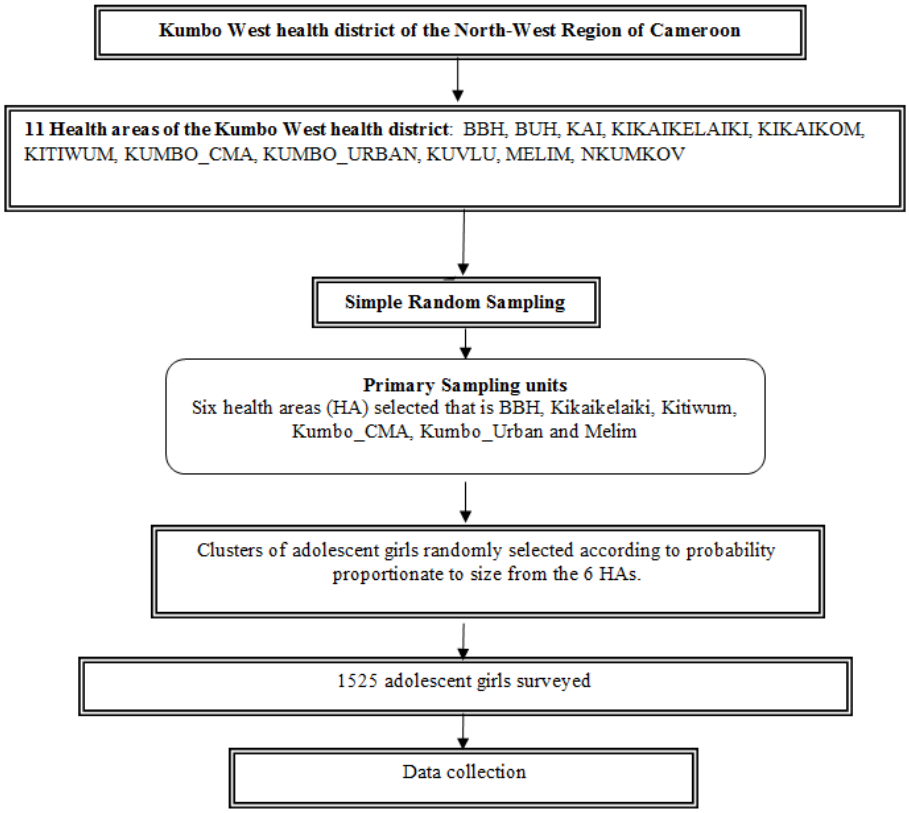

Figure 2: Flow chart of the sampling frame for the cross-sectional study.

S. No	Health Areas of Kumbo-West Health District	Total Population	Population of adolescent girls 10-19 yrs	Proportionate of adolescent girls 10-19 yrs
1	BBH	20,321	4633	450
2	KIKAIKELAIKI	6,724	1533	149
3	KITIWUM	5,250	1197	116
4	KUMBO_CMA	18,341	4182	406
5	KUMBO_URBAN	13,264	3024	294
6	MELIM	4,986	1137	110
	TOTAL	68,886	15706	1525

Table 1: Population distribution of selected Health Areas of the Kumbo-West Health District for the exploratory cross-sectional study.

2.3 Sample size determination

Calculation of sample size was done based on the formula of sample size calculation for cross sectional studies [12], as follows;

$$n = \frac{Z^2 P(1-P)(DEFF)}{d^2} = \frac{(1.96)^2\ 0.5\ (0.5)3.9}{0.05^2} = 1498 \text{ adolescents}$$

Where n is the sample size,

z=1.96 is the critical value of the confidence interval for a standard normal distribution (for 95% confidence intervals).

p=0.5 is an estimate of the expected prevalence (as this expected proportion p produces the largest sample size (for a given values of d and DEFF).

Note: p=0.5 is because no study as such has been carried out in Cameroon.

DEFF=3.9 is the estimated design effect and d=0.05 is the required precision. We rounded up the sample size to 1525 participants.

2.4 Community mobilization

Mobilization activities at the communities were conducted before the survey team started fieldwork in each cluster. The community mobilization team focused on using key messages of the survey. Mobilization team consisted of individuals who are well-known and respected in the community and were trained to facilitate communication about the survey. The community leaders were consulted and provided with information on the purpose of the survey to share with their community members. During the fieldwork, designated survey staffs monitored the local community response, and addressed/clarify any questions/concerns regarding the survey especially as the study area is experiencing a socio-political unrest.

2.5 Sampling

Multi-stage cluster sampling was used to select 6 health areas from the Kumbo West Health district namely BBH, Kikaikelaiki, Kitiwum, Kumbo_CMA, Kumbo_Urban and Melim in the Bui division of the North-West region of Cameroon and 1525 participants (according to probability proportionate to size) were further selected using systematic random sampling from households.

2.6 Data collection

Structured questionnaires were administered to capture related data. A structured questionnaire was administered to selected adolescent girls who agreed to participate in the study. The questionnaires were interviewed-administered in English/Pidgin-English and for a participant who was not literate enough to get any of these two, it was obviously done with the guide of the trained data collector in the dialect. The questionnaire was made up of eleven sections namely Socioeconomic and family characteristics, Sources of information on, and knowledge of reproductive health, Current/most recent heterosexual relationship**,** Types of heterosexual contact**,** First sexual relationship**,** Homosexual

experiences**,** Knowledge and ever-use of contraceptive methods**,** Knowledge of HIV/AIDS and sexually transmitted diseases**,** Condom knowledge and attitudes**,** Sexuality, gender and norms**,** Use and perceptions of health services.

2.7 Data management

A coded number was given to identify each participant. Collected data was firstly entered into the research log book. Research questionnaires as well as work books and other study materials were stored safely in a locker in a safe location and secured by locking it with a lock. After collection of the data, the questionnaires and data collection forms were checked visually for completeness, obvious errors, and inconsistencies and then corrected. Data collected was entered daily into an electronic questionnaire (template) created in Epi info version 7 by the investigator. During the data entry process, 10% of data entered at the beginning was checked to ensure that the data was correctly entered. For confidentiality, the computer in which the data was stored was password protected and the information was accessible only to the researcher. Data was backed-up in an external hard drive and email box. The data was then imported into Microsoft excel spread sheet to be cleaned/edited and finally analysed using social science package statistical software version 21.

2.8 Data analysis

The analysis of participant demographics and outcome variables was summarized using descriptive summary measures: expressed as mean (standard deviation) or median (minimum-maximum) for continuous variables and number (percentages) for categorical variables. The chi-squared test for binary outcomes was used. All statistical tests were performed using two-sided tests at the 0.05 level of significance. The Bonferroni method was used to adjust the level of significance for testing for secondary outcomes to keep the overall level at alpha=0.05. For all group comparisons, the results were expressed as effect (or odds ratio for binary outcomes), corresponding two-sided 95% confidence intervals and associated p-values. P-values were reported to two/three decimal places with values less than 0.001 reported as <0.001. Adjusted analyses using baseline covariates were performed using regression techniques to investigate the residual impact of key baseline characteristics on the outcomes. All analyses shall be performed using SPSS (Statistical Package for the Social Sciences) version 21 for Windows.

2.9 Ethical considerations

Ethical approval was obtained from the Institutional Review Board of the Faculty of Health Sciences (IRB-FHS N^{o}: 765-03) of the University of Buea. The administrative approval was obtained from the Regional Delegation of Public Health for the North West Region of Cameroon and other relevant authorities. Informed consent/parental/guardian permission/assent was taken from every participant prior to collection of data and interviews were conducted in private.

3. Results

3.1 Section 1: Socioeconomic characteristics of participants

The sociodemographic characteristics of the participants are summarised in Table 2. A total of 1525 adolescent girls aged 10-19 years participated in our study. The mean age of the participants was 15.6 (SD=2.20) years. Majority (65.1%) of the participants were aged between 15 and 19 years. Regarding level of education, 66.1% and 26.0% of the respondents had completed primary and secondary school respectively while 7.9% had no formal education. The mean number of years expected to continue schooling was 7.3 (SD=2.5). About half (47.4%) of the respondents had worked for payment and 30.3% of them reported they were in search of a job. Majority (84.1%) of the participants were Christians by faith while 14.9% were Muslims. Seventy percent (70%) of the participants resided with their nuclear family (either mother or father or both). The proportion of adolescent girls who had consumed alcohol in the past 30 days was 29.9% (95% CI: 27.6-32.2).

Characteristic	**No (%)**
Age (years)	**15.06 ± 2.2 (Mean ± SD) 10-19 (Range)**
10-14	529 (34.9)
15-19	988 (65.1)
Highest level of education completed	
No formal education	121 (7.9)
Primary education	1008 (66.1)
Secondary education	396 (26.0)
Number of years expected to continue schooling	**7.3 ± 2.5 (Mean ± SD) 1-14 (Range)**
1-7	487 (53)
8-14	424 (46.5)
Ever worked for payment	
No	672 (52.6)
Yes	605 (47.4)
Searching for a job	
No	866 (69.7)
Yes	376 (30.3)
Religion	
None	15 (1.0)
Christians	1238 (84.1)
Muslims	219 (14.9)
Living with nuclear family (Father and/or mother)	
No	455 (30.0)
Yes	1062 (70.0)

Consumed alcohol in the last 30 days	
No	1056 (70.1)
Yes	450 (29.9)

SD=Standard Deviation

Table 2: Summary of Sociodemographic characteristics of the participants (n=1525).

3.2 Section 2: Sources of information on, and knowledge of reproductive health

The participants relied on their mothers (57.5%), school teachers (35.7%) and sisters (27.8%) for information on puberty (Figure 3). The participants preferred to learn about puberty from health personnel (28.9%), mothers (26.5%) and school teachers (19.0%). The respondents relied on school teachers (66.6%), their mothers (27.3%), and sisters (25.1%) for information on sexual and reproductive health (Figure 4). They preferred to learn about sexual and reproductive health from their mothers (25.9%), books/magazines (25.6%) and health personnel (19.8%). The participants relied on school teachers (33.6%), their friends or peers (32.4%) and health workers (30.2%) for information on relationships (Figure 5). They preferred to learn about relationships from their friends/peers (34.7%), sisters (26.9%) and health personnel (17%).

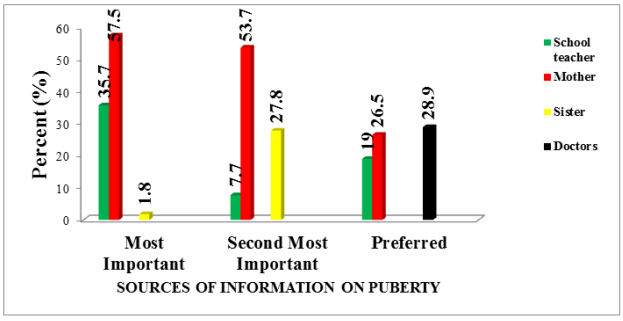

Figure 3: Most important and preferred sources of information on puberty.

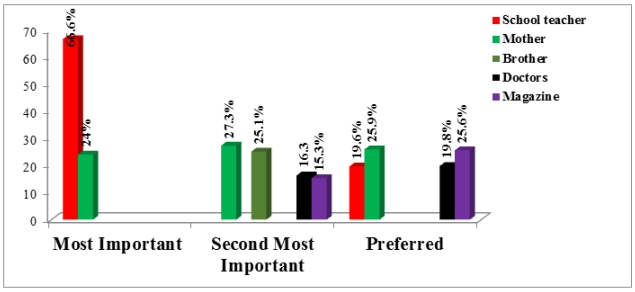

Figure 4: Most important and preferred sources of information on sexual and reproductive health.

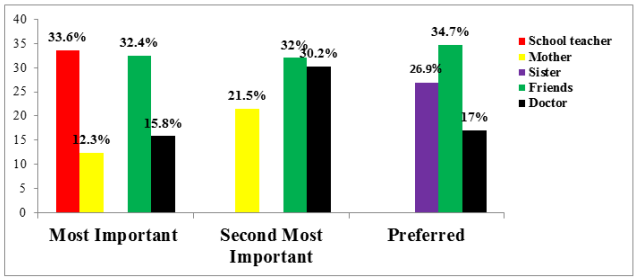

Figure 5: Most important and preferred sources of information on relationships.

3.3 Section 3: Current/most recent heterosexual relationship

3.3.1 Risky sexual behavior: The proportion of respondents who had ever had a boyfriend, ever had sexual intercourse, had used a condom during the last sexual intercourse and had more than 2 sexual partners in the last 12 months were 46.8% (95% CI: 43.8-49.7), 41.9% (95% CI: 38.7-45.2), 73.3% (95% CI: 70.1-77.6) and 81.1 (95% CI: 76.6-84.7) respectively (Figure 6).

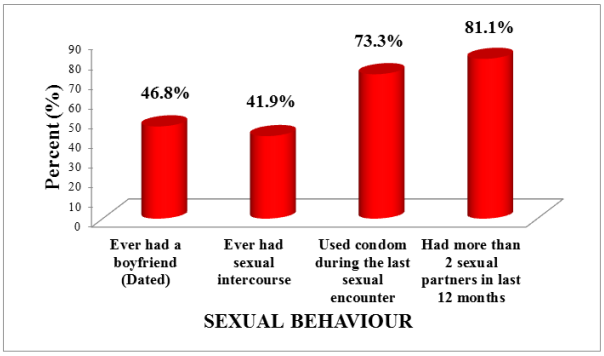

Figure 6: Sexual behaviour of respondents.

3.3.2 Determinants of sexual behaviours of the respondents: After adjusting for confounders, the odds of reporting ever having had a boyfriend were lower among participants who had never worked for payment (AOR: 0.52; 95% CI: 0.28-0.94), not being a job seeker (AOR: 0.40; 95% CI: 0.19-0.82), being a Muslims (AOR: 0.1; 95% CI: 0.01-0.5), living with nuclear family (AOR: 0.16; 95% CI: 0.05-0.44) and having consumed alcohol (AOR: 0.44; 95% CI: 0.24-0.78). However, the odds of reporting ever having had a boyfriend were higher among older (15-19 years) participants (AOR: 8.03; 95% CI: 4.3-15.26) (Table 3). After adjusting for confounders, the odds of reporting ever having had sexual intercourse were lower among participants who had a higher number of years expected to continue schooling (AOR: 0.59; 95% CI: 0.34-0.95), not being a job seekers (AOR: 0.53; 95% CI: 0.29-0.97), being a Muslim (AOR: 0.03; 95% CI: 0.01-0.07) and living with nuclear family (AOR: 0.35; 95% CI: 0.17-0.70). However, the odds of reporting ever having had sexual intercourse were higher among older (15-19 years) participants (AOR: 1.93; 95% CI: 1.01-3.31) compared to younger counterparts (Table 3). After adjusting for confounders, the odds of reporting ever using a condom during the last sexual intercourse were lower among participants living with nuclear family (AOR: 0.16; 95% CI: 0.04-0.73). However, the odds of reporting ever using a condom during the last sexual intercourse were higher among older (15-19 years) participants (AOR: 3.88; 95% CI:

2.96-5.66) and having completed secondary education (AOR: 2.46; 95% CI: 1.02-4.89) (Table 3). After adjusting for confounders, the odds of reporting ever having had more than 2 sexual partners in the last 12 months were higher among older (15-19 years) participants (AOR: 4.33; 95% CI: 1.30-10.36) and having completed secondary education (AOR: 5.56; 95% CI: 1.64-18.8) (Table 3).

Variable	Categories	Ever had a boyfriend (Dated)		Ever had sexual intercourse		Used condom during the last sexual intercourse		Had more than 2 sexual partners in last 12 months	
		AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
Age (years)	10-14	1		1		1		1	
	15-19	8.03	(4.22-5.26)	1.90	(1.01-3.31)	3.88	(2.96-5.66)	4.33	(1.30-10.36)
Level of Education	No formal	1		1		1		1	
	Primary	1.05	(0.55-2.00)	1.15	(0.6-2.05)	0.14	(0.03-0.61)	1.26	(0.96-2.91)
	Secondary	0.96	(0.46-2.33)	0.83	(0.63-3.08)	2.46	(1.02-4.89)	5.56	(1.64-18.8)
Number of years expected to school	1-7	1		1		1		1	
	8-14	0.63	(0.35-1.15)	0.59	(0.34-0.95)	0.57	(0.17-1.87)	0.49	(0.16-1.47)
Ever worked for payment	Yes	1		1		1		1	
	No	0.52	(0.28-0.94)	1.56	(0.9-2.63)	0.51	(0.15-1.73)	2.44	(0.86-6.90)
Searching for a job	Yes	1		1		1		1	
	No	0.40	(0.19-0.82)	0.53	(0.29-0.97)	0.67	(0.22-2.09)	0.41	(0.14-1.21)
Religion	None	1		1		1		1	
	Christians	1.72	(0.27-10.92)	0.94	(0.78-2.01)	-	-	-	-
	Muslims	0.06	(0.008-0.50)	0.03	(0.01-0.07)	-	-	-	-
Living with nuclear	No	1		1		1		1	
	Yes	0.16	(0.05-0.44)	0.35	(0.17-0.70)	0.16	(0.04-0.73)	1.83	(0.53-6.30)

family									
Consumed alcohol in the last 30 days	Yes	1		1		1		1	
	No	0.44	(0.24-0.78)	1.27	(0.74-2.19)	0.54	(0.14-2.13)	1.40	(0.43-4.55)

AOR-Adjusted Odd Ratio; CI-Confidence Interval

Table 3: Determinants of risky sexual behaviours among respondents in KWHD.

3.4 Section 4: Age of sexual debut

The mean age of sexual debut was 15.23 (SD=2.82) years and ranged from 9-19 years. Sexual debut occurred at a very young age, with 5.98% being 9 years or younger, 12.82% being 10-13 years and 59.83% being 14-17 years and 21.37% experiencing sexual debut at 18 years or older (Figure 7).

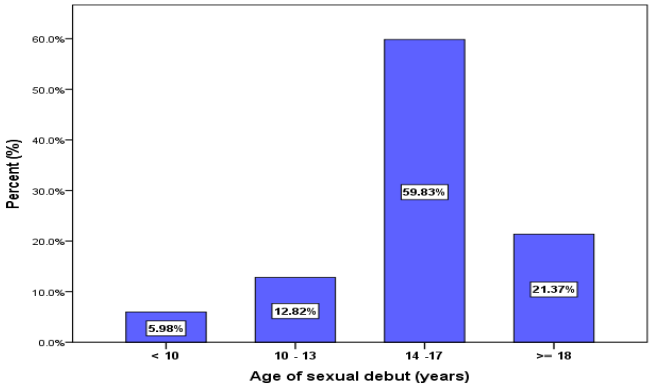

Figure 7: Age of sexual debut of respondents.

3.4.1 Association between sociodemographic characteristics and age of sexual debut: The mean age of sexual debut was significantly lower among participants who had never worked for payment (t=2.931, p=0.004), living in a nuclear family (t=3.94, p<0.001) and having consumed alcohol in the last 30 days (t=-4.77, p<0.001) as reported in Table 4.

Variable	Categories	Mean ± SD	T or F-value	*p-value*
Age (years)	10-14	12.85 ± 2.71	-	-
	15-19	15.45 ± 2.72	-2.30	0.064
Level of Education	No formal	15.50 ± 2.53	-	-
	Primary	14.94 ± 3.25	-	-
	Secondary	14.00 ± 0.01	0.842	0.434
Number of years	1-7	15.76 ± 2.25	-	-

expected to school	8-14	15.76 ± 2.28	0.001	0.999
Ever worked for payment	Yes	16.07 ± 2.46	-	-
	No	14.61 ± 2.86	2.931	0.004
Searching for a job	Yes	15.73 ± 2.17	-	-
	No	15.93 ± 2.35	-0.434	0.665
Religion	None	14.20 ± 0.45	-	-
	Christians	15.32 ± 1.33	-	-
	Muslims	14.01 ± 0.23	0.137	0.731
Living with nuclear family	No	16.45 ± 1.46	-	-
	Yes	14.79 ± 1.02	3.94	<0.001
Consumed alcohol in the last 30 days	Yes	14.45 ± 2.98	-	-
	No	16.68 ± 1.96	-4.77	<0.001

SD=Standard Deviation

Table 4: Association between Sociodemographic characteristics and age of sexual debut in KWHD.

3.5 Section 5: Homosexual behaviours or experiences

The proportion of participants who reported been sexually attracted to persons of the same sex was 10.82% (95% CI: 8.4-14.5). The proportion of participants who reported having had sexual contact with persons of the same sex was 6.48% (95% CI: 3.9-8.2).

3.5.1 Determinants of homosexual behaviour: After adjusting for confounders, the odds of reporting ever being sexually attracted to same sex were lower among participants who had never worked for payment (AOR: 0.523; 95% CI: 0.25-0.99) compared to respondents who had ever worked for payment. However, the odds of reporting ever being sexually attracted to same sex were higher among participants who consumed alcohol in the last 30 days (AOR: 2.61; 95% CI: 1.29-5.31) (Table 5). After adjusting for confounders, the odds of reporting ever had sexual contact with persons of same sex were higher among participants living with nuclear family (AOR: 2.95; 95% CI: 1.24-7.00) and participants who consumed alcohol in the last 30 days (AOR: 2.19; 95% CI: 1.18-4.09) (Table 5).

Variable	**Categories**	**Sexually attracted to same sex**		**Ever had sexual contact with same sex**	
		AOR	**(95% CI)**	**AOR**	**(95% CI)**
Age (years)	10-14	1	-	1	-
	15-19	1.42	(0.67-3.12)	1.64	(0.75-3.61)
Level of Education	No formal	1	-	1	-
	Primary	1.03	(0.78-2.12)	0.55	(0.21-1.05)
	Secondary	1.98	(0.96-3.86)	0.43	(0.13-1.08)

Number of years expected to school	1-7	1	-	1	-
	8-14	0.50	(0.35-1.15)	0.57	(0.30-1.06)
Ever worked for payment	Yes	1	-	1	-
	No	0.52	(0.25-0.99)	1.36	(0.73-2.52)
Searching for a job	Yes	1	-	1	-
	No	0.87	(0.42-1.79)	1.15	(0.57-2.29)
Religion	None	1	-	1	-
	Christians	1.81	(0.92-3.90)	-	-
	Muslims	0.54	(0.23-1.22)	-	-
Living with nuclear family	No	1	-	1	-
	Yes	1.65	(0.61-4.89)	2.95	(1.24-7.00)
Consumed alcohol in the last 30 days	Yes	1	-	1	-
	No	2.61	(1.29-5.31)	2.19	(1.18-4.09)

AOR-Adjusted Odd Ratio; CI-Confidence Interval

Table 5: Determinants of homosexual behaviours in KWHD.

3.6 Section 6: Knowledge and ever-use of contraceptive methods

3.6.1 Level of knowledge of the participants on contraceptive methods: Participants' knowledge on contraceptive methods were grouped into two categories based on their knowledge score. Participants whose scores were equal to or greater than the mean score were considered to have correct knowledge and those whose scores were below the mean score were considered to have incorrect knowledge on contraceptive methods. However, 81.1% of the participants had a correct knowledge on contraceptive methods.

3.6.2 Contraceptive methods frequently used to prevent pregnancy: As per the different contraceptive methods used by the participants, Majority (84.8%) of them reported that they use condoms as the major contraceptive method meanwhile just 2.9% reported they use pills. Also 0.6% and 7.4% of them reported that they take injections and adopted the withdrawal method respectively (Figure 8).

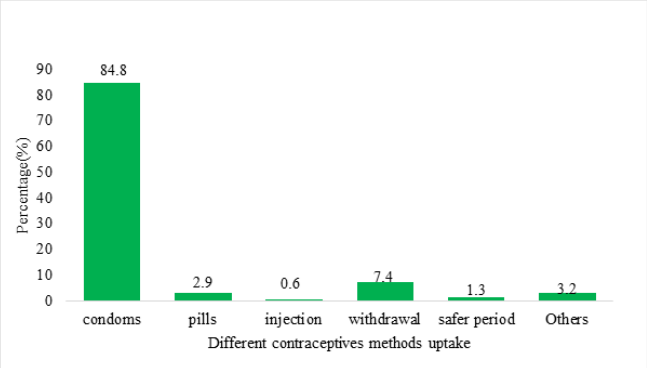

Figure 8: Contraceptive uptake.

3.6.3 Multivariate logistic regression in determining predictors of correct knowledge on contraceptive methods: In order to determine the predictors of correct knowledge on contraceptive methods, sociodemographic and other parameters were subjected to a logistic regression model. Firstly these parameters were loaded into a univariate logistic regression model and the crude odd ratios with P-values determined. Secondly, these parameters were subjected to a multivariate logistic regression model in order to get rid of confounders and as such, parameters with significant P-value (<0.05) were considered as predictors of correct knowledge on contraceptive methods. Here, only number of sexual partner in the past 12 months was statistically associated with correct knowledge on contraceptive methods. Those who have had <2 sexual partners in the past 12 months were 0.17 times less likely to have correct knowledge on contraceptive methods compared to those with ≥ 2 sexual partners (Table 6).

Variables	**COR (95% CI)**	***P*-value**	**AOR (95% CI)**	***P*-value**
Age				
10-14	0.23 (0.02-2.21)	0.201	0.20 (0.02-2.27)	0.193
15-19	1	-	1	-
Educational level				
Primary education	1	-	1	-
Secondary education	1.57 (0.71-3.54)	0.267	1.71 (0.77-2.99)	0.551
Religion				
Christian	1	-	1	-
Muslim	0.74 (0.18-3.06)	0.683	0.42 (0.08-2.03)	0.281
Have ever heard of HIV/AIDS				
No	1	-	1	-
Yes	2.12 (0.88-3.12)	0.781	1.81 (0.72-2.99)	0.890
Age at first sexual intercourse (Year)				
>14	1	-	1	-
<14	0.44 (0.12-1.62)	0.233	0.72 (0.14-3.62)	0.621
Number of sexual partners in the past 12 months				
≥2 partners	1	-	1	-
<2 partners	0.17 (0.05-0.62)	0.007*	0.17 (0.04-0.66)	0.011*
History of STDs in the past 12 months				
No	1	0.881	1	-
Yes	1.07 (0.40-2.89)	-	2.01 (0.99-3.22)	0.578
Use of condom in the last sex				
No	1	-	1	-
Yes	2.25 (0.83-6.08)	0.110	1.96 (0.56-6.82)	0.293

COR-Crude Odd Ratio; AOR-Adjusted Odd Ratio; CI-Confidence Interval

Table 6: Multivariate logistic regression in determining predictors of correct knowledge on contraceptive methods in KWHD.

3.7 Section 7: Knowledge of HIV/AIDS and sexually transmitted diseases

Participants' knowledge were grouped into two categories based on their score on the knowledge of HIV/AIDS and sexually transmitted disease section on the questionnaires. Participants whose score were equal to or greater than the mean score were considered to have correct knowledge and those whose scores were below the mean score were considered to have incorrect knowledge on HIV/AIDS and sexually transmitted diseases, therefore 78.6% of the participants had incorrect knowledge on HIV/AIDS and sexually transmitted diseases.

3.7.1 Multivariate logistic regression for Predictors of good knowledge on HIV/AIDS and sexually transmitted diseases: In order to determine the predictors of good knowledge on HIV/AIDS and sexually transmitted diseases, sociodemographic characteristics and other parameters were subjected to a logistic model. Firstly these parameters were loaded into univariate logistic regression model and the crude odd ratio with P-values determined. Secondly, these parameters were then subjected to multivariate logistic regression model in order to get rid of confounders Parameters with a significant P-value (<0.05) were considered as predictors of good knowledge on HIV/AIDS and sexually Transmitted diseases. However, variables that were statistically associated with good knowledge on HIV/AIDS and sexually transmitted diseases were: Age of first sexual intercourse, and whether the participants have ever heard of HIV/AIDS. Participants who had their first sexual intercourse at age >14 were 2.9 times more likely to have good knowledge on HIV/AIDS and sexually transmitted diseases compared to those who had their first sexual intercourse at age <14years. In the same light, participants who reported to have heard of HIV/AIDS had higher odds 2.5 (1.20-3.92) of having good knowledge on HIV/AIDS and sexually transmitted diseases compared to those who had not heard of HIV/AIDS and sexually transmitted diseases (Table 7).

Variables	**COR (95% CI)**	***P*-value**	**AOR (95% CI)**	***P*-value**
Age				
10-14	1	0.77	1	0.88
15-19	2.3 (0.04-3.33)	-	1.8 (0.66-2.45)	-
Educational level				
Primary	1	-	1	-
Secondary	1.9 (0.23-3.11)	0.09	1.5 (0.41-2.91)	0.44
Religion				
Muslim	1	-	1	0.61
Christian	2.9 (0.77-4.11)	0.74	2.3 (0.63-3.91)	-
Have ever heard of HIV/AIDS				
No	1	-	1	0.04
Yes	2.9 (1.10-4.21)	0.034	2.5 (1.20-3.92)	-
Age at first sexual intercourse (Year)				
<14	1	0.01	1	0.02
>14	3.1 (2.11-4.22)	-	2.9 (1.91-3.99)	-

Number of sexual partners in the past 12 months				
<2 partners	1	-	1	0.74
≥2 partners	1.7 (0.67-2.77)	0.88	1.5 (0.44-2.44)	-
History of STDs in the past 12 months				
No	1	0.33	1	-
Yes	1.7 (0.44-2.31)	-	1.3 (0.41-2.11)	0.21
Use of condom in the last sex				
No	1	0.03	1	-
Yes	2.5 (1.22-3.71)	-	2.3 (1.24-3.12)	0.04

COR-Crude Odd Ratio; AOR-Adjusted Odd Ratio; CI-Confidence Interval

Table 7: Multivariate logistic regression for Predictors of good knowledge on HIV/AIDS and sexually transmitted diseases in KWHD.

3.8 Section 8: Condom knowledge and attitudes

3.8.1 Perception about condoms: The proportion of participants with good perception about condoms was 47.21% (95% CI: 44.7-49.7). The mean perception score of participants was 3.21 (SD=0.21).

3.8.2 Determinants of good perceptions about condoms: In the Bivariate analysis all the sociodemographic factors were significantly associated with good perception about male condoms. After adjusting for confounders, the odds of reporting good perception about condom were higher among older (15-19 years) participants (AOR: 5.89; 95% CI: 3.09-11.20) compared to their younger (10-14 years) counterparts (Table 8).

Variable	**Categories**	**Good perception about condoms**			
		UOR	**(95% CI)**	**AOR**	**(95% CI)**
Age (years)	10-14	1	-	1	-
	15-19	1.28	(1.04-1.59)	5.89	(3.09-11.20)
Level of Education	No formal	1	-	1	-
	Primary	7.61	(6.29-11.99)	0.71	(0.39-1.29)
	Secondary	8.11	(6.98-12.03)	0.85	(0.46-1.21)
Number of years expected to school	1-7	1	-	1	-
	8-14	0.08	(0.06-0.12)	0.73	(0.42-1.27)
Ever worked for payment	Yes	1	-	1	-
	No	2.95	(2.33-3.75)	0.63	(0.37-1.06)
Searching for a job	Yes	1	-	1	-
	No	0.11	(0.08-0.16)	0.67	(0.35-1.28)
Religion	None	1	-	1	-

	Christians	2.41	(0.68-8.60)	0.58	(0.08-4.00)
	Muslims	4.23	(3.97-5.54)	0.66	(0.32-4.23)
Living with nuclear family	No	1	-	1	-
	Yes	11.19	(8.27-15.14)	1.18	(0.58-2.41)
Consumed alcohol in the last 30 days	Yes	1	-	1	-
	No	2.91	(2.29-3.69)	1.06	(0.62-1.82)

UOR-Unadjusted Odd Ratio; AOR-Adjusted Odd Ratio; CI-Confidence Interval

Table 8: Determinants of good perception about male condoms in KWHD.

3.9 Section 9: Sexual consent and gender-based violence

The proportion of participants reporting ever been forced to have sexual intercourse was 13.06% (95% CI: 10.95-15.52). The proportion of participants experiencing touching of breast or hips without consent was 23.28% (95% CI: 20.54-25.26). The proportion of participants reporting ever having a "one night stand" and having sex in exchange of gift and money were 1.9% (95% CI: 1.17-3.08) and 1.19% (95% CI: 0.64-2.19) respectively (Figure 9).

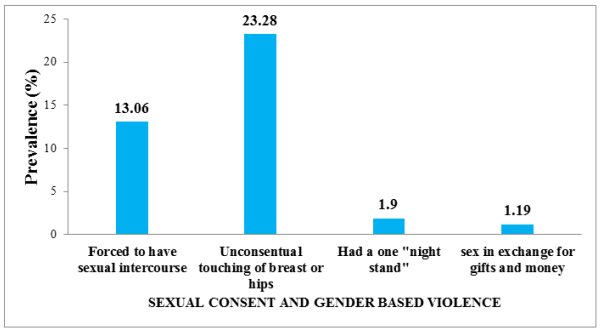

Figure 9: Sexual consent and gender-based violence.

3.9.1 Determinants of sexual consent and gender-based violence: After adjusting for confounders, the odds of reporting ever being forced to have sexual intercourse were lower among participants who were not job seekers (AOR: 0.43; 95% CI: 0.23-0.79) compared to respondents who were searching for jobs. However, the odds of reporting ever being forced to have sexual intercourse were higher among older (15-19 years) participants (AOR: 2.46; 95% CI: 1.15-5.27) and participants who did not consume alcohol in the last 30 days (AOR: 1.97; 95% CI: 1.10-3.53 (Table 9). After adjusting for confounders, the odds of reporting ever being touched on the breast/hip without consent were higher among older (15-19 years) participants (AOR: 3.17; 95% CI: 1.62-6.20) compared to younger (10-14 years) participants (Table 9). After adjusting for confounders, the odds of reporting ever having a one "night stand" were lower among participants who were not job seekers (AOR: 0.19; 95% CI: 0.05-0.78) compared to respondents who were searching for jobs. However, the odds of reporting ever having one "night stand" were higher among participants who did not consume alcohol in the last 30 days (AOR: 7.84; 95% CI: 1.40-39.9) compared to those who consume alcohol in the last 30 days (Table 9). After adjusting for confounders, the odds of reporting ever having sex in exchange for gift and money were lower among participants who had completed secondary education (AOR: 0.21; 95% CI: 0.07-0.45) compared to respondents who had no formal education.

However, the odds of reporting ever having sex in exchange for gift or money were higher among participants who were not job seekers (AOR: 5.32; 95% CI: 3.62-9.21) compared to those who were job seekers (Table 9).

Variable	Categories	Ever forced to have sexual intercourse		Ever been touched on breast/hips without consent		Ever had a "one night stand"		Ever had sex in exchange gift or money	
		AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
Age (years)	10-14	1	-	1	-	1	-	1	-
	15-19	2.46	(1.15-5.27)	3.17	(1.62-6.20)	-	-	0.20	(0.04-1.01)
Level of Education	No formal	1	-	1	-	1	-	1	-
	Primary	0.78	(0.42-1.47)	1.15	(0.80-2.62)	1.93	(0.51-7.10)	0.03	(0.003-0.25)
	Secondary	0.68	(0.32-1.66)	1.62	(0.88-2.55)	1.56	(0.48-6.22)	0.21	(0.07-0.45)
Number of years expected to school	1-7	1	-	1	-	1	-	1	-
	8-14	0.83	(0.46-1.48)	1.36	(0.75-2.44)	2.38	(0.66-8.50)	-	-
Ever worked for payment	Yes	1	-	1	-	1	-	1	-
	No	0.68	(0.39-1.18)	0.64	(0.37-1.09)	0.65	(0.15-2.84)	0.85	(0.23-3.14)
Searching for a job	Yes	1	-	1	-	1	-	1	-
	No	0.43	(0.23-0.79)	0.58	(0.31-1.08)	0.19	(0.05-0.78)	5.32	(3.62-9.21)
Living with nuclear family	No	1	-	1	-	1	-	1	-
	Yes	0.82	(0.40-1.67)	1.53	(0.76-3.08)	1.11	(0.25-4.84)	2.49	(0.34-7.8)
Consumed alcohol in the last 30 days	Yes	1	-	1	-	1	-	1	-
	No	1.97	(1.10-3.53)	1.18	(0.68-2.05)	7.84	(1.40-39.9)	0.88	(0.22-3.50)

AOR-Adjusted Odd Ratio; CI-Confidence Interval

Table 9: Determinants of sexual consent and gender-based violence in KWHD.

3.10 Section 10: Use and perceptions of health services

3.10.1 Utility and perception on sexual and reproductive health services: The proportion of participants who reported ever visiting a health facility to receive sexual and reproductive health services was 61.0% (95% CI: 51.8-69.5). The proportion of participants reporting ever feeling comfortable at the health facility during provision of sexual and reproductive health services was 65.3% (95% CI: 56.1-73.4). Proportion of participants reporting that they felt confidentiality was respected at the health facility providing sexual and reproductive health services was 62.7% (95% CI: 53.5-71.1) (Figure 10).

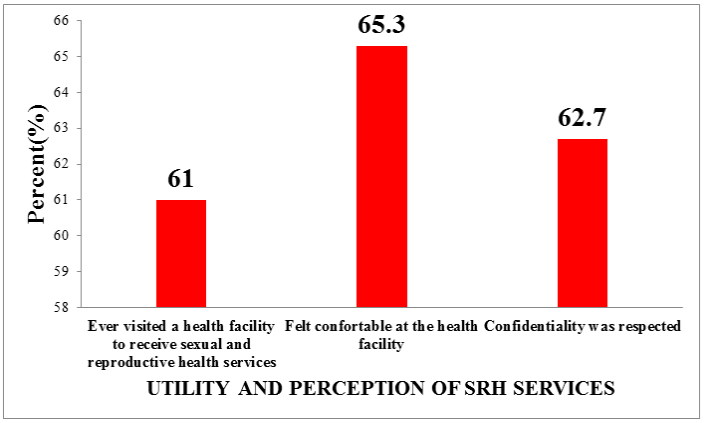

Figure 10: Utility and perceptions on sexual and reproductive health services.

3.10.2 Determinants of utility and good perception on SRH services: After adjusting for confounders, the odds of reporting ever visiting a health facility to receive sexual and reproductive health services were lower among participants who had completed secondary education (AOR: 0.32; 95% CI: 0.16-0.57), who had a higher number of years expected to continue schooling (AOR: 0.48; 95% CI: 0.26-0.97), having never worked for payment (AOR: 0.46; 95% CI: 0.24-0.89) and having consumed alcohol in the last 30 days (AOR: 0.29; 95% CI: 0.15-0.55). However, the odds of reporting ever visiting a health facility to receive sexual and reproductive health services were higher among participants living with their nuclear family (AOR: 8.34; 95% CI: 2.66-29.34) compared to participants not living with nuclear family (Table 10). After adjusting for confounders, the odds of reporting ever feeling comfortable at the health facility providing sexual and reproductive health services were lower among participants who had a higher number of years expected to continue schooling (AOR: 0.26; 95% CI: 0.09-0.72) compared to those who had a lower number of years expected to continue schooling (Table 10). After adjusting for confounders, the odds of reporting that participants felt that confidentiality will be respected at the health facility providing sexual and reproductive health services were lower among participants who had a higher number of years expected to continue schooling (AOR: 0.18; 95% CI: 0.05-0.67) compared to those who had a lower number of years expected to continue schooling. The odds of reporting that confidentiality will be respected were lower among participants who had not worked for payment (AOR: 0.25; 95% CI: 0.07-0.83) compared to those who had worked before for payment (Table 10).

Variable	Categories	Ever visited a health facility to receive SRH services		Felt comfortable at the health facility		Confidentiality was respected	
		AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
Age (years)	10-14	1	-	1	-	1	-
	15-19	1.63	(0.68-3.89)	2.35	(0.61-8.96)	2.5	(0.42-9.25)
Level of Education	No formal	1	-	1	-	1	-
	Primary	0.72	(0.51-1.47)	2.04	(0.53-7.81)	0.41	(0.10-1.76)
	Secondary	0.32	(0.16-0.57)	1.74	(0.72-6.31)	0.34	(0.09-1.46)
Number of years expected to school	1-7	1	-	1	-	1	-
	8-14	0.48	(0.23-0.97)	0.26	(0.09-0.72)	0.18	(0.05-0.67)
Ever worked for payment	Yes	1	-	1	-	1	-
	No	0.46	(0.24-0.89)	0.44	(0.16-1.23)	0.25	(0.07-0.83)
Searching for a job	Yes	1	-	1	-	1	-
	No	1.29	(0.63-2.64)	0.35	(0.09-1.38)	0.93	(0.18-4.86)
Living with nuclear family	No	1	-	1	-	1	
	Yes	8.34	(2.66-29.34)	0.88	(0.10-7.59)	3.08	(0.27-37.13)
Consumed alcohol in the last 30 days	Yes	1	-	1	-	1	-
	No	0.29	(0.15-0.55)	0.86	(0.33-2.22)	1.76	(0.52-5.91)

AOR-Adjusted Odd Ratio; CI-Confidence Interval

Table 10: Determinants of utility and good perception on SRH services in KWHD.

4. Discussion

The study was the first effort to specifically assess the sexo-reproductive health needs of adolescent girls in a semi-urban/rural area using a large sample size in Kumbo, North West region of Cameroon. The use of a systematic random sampling and probability proportionate to size methods provided the opportunity to obtain a sample that is highly representative of the target population. The large sample size and the use of systemic random sampling make conclusions from our data valid.

4.1 Information is power, even in health care

Our study findings show that participants preferred to learn about puberty from health personnel (28.9%), mothers (26.5%) and school teachers (19.0%). The respondents relied on school teachers (66.6%), their mothers (27.3%),

and sisters (25.1%) for information on sexo-reproductive health. This is important because obtaining information from school teacher on sexo-reproductive health is important as it correlates with studies of Wanje *et al.* [13] and Kamrani *et al.* [14]. The participants preferred to learn about relationships from their friends/peers (34.7%), sisters (26.9%) and health personnel (17%).

4.2 Sexuality and condom use

In this study, 41.9% of adolescent girls that is both early and late were sexually active. However, in both age groups condom use was 73.3%. The strongest variable of condom use in sexual intercourse was its use in the last sexual encounter and having had sex with more than 2 sexual partners in the last 12 months preceding the study. This is important because consistent and correct condom use prevents sexually transmitted diseases as well as early and unwanted pregnancies. Similar findings have been reported in youth studies, implying that sexually active youths who consistently use condoms protect themselves from sexually transmitted diseases and unwanted pregnancies [15-18]. Our data suggests that late adolescent girls were the majority of the sexually active respondents with many in upper secondary schools using condoms compared to early adolescent girls who are in lower secondary and primary schools. The proportion of participants with good perception about condoms was 47.21%. Good perception about condom were higher among older (15-19 years) participants compared to their younger counterparts. This implies that adolescent girls in upper secondary school gain critical knowledge which influences their sexual decisions. This is consistent with studies that found that sexuality education among the youth reduces risky behaviour, unwanted pregnancy and sexually transmitted diseases [19-21]. However, it is possible that sexually active young people in lower secondary and primary schools have limited access to sex education and negotiation power over condom use, especially if their sexual partners are older. Our findings suggest that few adolescent girls knew how and where to access other forms of contraception apart from condoms.

4.3 Sex education and negotiation skills

Lack of in-depth sex education and negotiation skills in lower secondary and primary schools exposes early adolescent age groups at risk. Evidence suggests that sex education is most effective when delivered to pre-sexually active young people [22-24]. The mean age of sexual debut was 15.23 (SD=2.82) years and ranged from 9-19 years. Sexual debut occurred at a very young age, with 5.98% being 9 years or younger, 12.82% being 10-13 years and 59.83% being 14-17 years and 21.37% experiencing sexual debut at 18 years or older. This could explain why condom use among post-secondary adolescent girl was lower than in respondents with higher secondary education given that sexual debut occurs at very young age. Sexual debut was significantly lower among participants who had never worked for payment, living in a nuclear family and having consumed alcohol in the last 30 days. This data suggest that poverty, drug abuse and living arrangements is associated with sexual debut. This suggests that adolescent girls living with relatives other than their parents, and those living with no relatives, were more vulnerable to sexually transmitted diseases and unwanted pregnancy because of limited negotiation powers with their sexuality. Similar findings by Renzaho et al. [1], Rosenbaum et al. [25] and Ortayli et al. [26], have reported in

youth studies elsewhere implying that young people living away from their parents are at a greater risk of sexual exploitation and abuse.

4.4 Sexual behaviors

Ybarra et al. [27] reported that lesbian and bisexual adolescents engage in risky sexual behaviors at higher rates than heterosexual girls. The Canadian Pediatric Society [28] had reported teens who will eventually identify as gay, lesbian or bisexual do not always do so during adolescence, notwithstanding in our study, we found that the proportion of participants who reported been sexually attracted to persons of the same sex was 10.82%. Adolescent girls who reported having had sexual contact with persons of the same sex was 6.48%. Also, we found that adolescent girls ever having had sexual contact with person of same sex were higher among participants living with nuclear family and participants who consumed alcohol in the last 30 days.

4.5 Knowledge on HIV/AIDS and sexually transmitted diseases

In our study, 78.6% of the participants had incorrect knowledge on HIV/AIDS and sexually transmitted diseases. A study by Manish et al. [29] reported that adolescent boys had more knowledge on HIV/AIDS and sexually transmitted diseases. Adolescent girls need to be empowered more because they are more vulnerable to STIs including HIV. However, variables that were statistically associated with good knowledge on HIV/AIDS and sexually transmitted diseases were: age of first sexual intercourse, and whether the participants had ever heard of HIV/AIDS. Participants who had their first sexual intercourse at age >14 were 2.9 times more likely to have good knowledge on HIV/AIDS and sexually transmitted diseases compared to those who had their first sexual intercourse at age <14years.

4.6 Transactional sex, an issue

Ever having sex in exchange for gift and money were lower among participants who had completed secondary education compared to respondents who had no formal education. However, the odds of reporting ever having sex in exchange for gift or money were higher among participants who were not job seekers compared to those who were job seekers. Mbirimtengerenji [30] in 2007 had earlier establish that HIV infection is mostly confined to the poorest, who constitute the most of those infected in Africa. It is not simply that information, education, and counseling activities are unlikely to reach the poor but that such messages are often irrelevant and inoperable given the reality of their lives.

4.7 Cameroon ministry of secondary education stake on adolescent pregnancy

In Cameroon, when adolescent girls are discovered pregnant; they are dismissed from school. This decision of dismissal is backed by Circular No 10/1/562 / MINESEC / EPM / EP, from the Cameroon Ministry of Secondary Education (MINESEC) [31] which states

"Any secondary schoolgirl who portrays any external signs of pregnancy shall be suspended from classes and shall be readmitted only if she satisfies the conditions of her age and conduct after delivery."

"Any high school student who has been recognized as pregnant, will also be suspended from classes in any public school, until the birth ".

4.8 Consensual/non-consensual adolescent sexuality

Evidence also suggests that adolescent school girls who fall pregnant drop out of school [32, 33], a double tragedy that further entrenches them and their offspring into a cycle of poverty due to missed education opportunities. Not surprisingly, many of the study participants reported their first sexual encounter was consensual, suggesting that most young people are choosing when they make their sexual debut. Therefore, the onus is on parents/guardians and policy makers to accept adolescent sexuality as a fact, and to provide adolescents with comprehensive sexo-reproductive education. Without this realisation, the social expectation that adolescents are not sexually active or that those who are will consistently use contraception remains a fallacy. Notwithstanding the consensual sexual debut, our data suggests a significant rate of non-consensual sexual debut among the vulnerable younger age group, young people living with non-relatives, and those still at school. Sexual debut as early as nine years suggests a highly sexualized environment in which children engage in sex at an early age, often without their consent. Furthermore, we noted that 13.06% of the respondents indicated powerlessness to prevent sexual abuse against them, i.e., they were forced to have sex against their will. Stronger empirical and action-backed policies are required to protect vulnerable young children, the disabled, and those living away from their parents, from sexual abuse.

4.9 Health facility and adolescent sexo-reproductive health

In our study, the proportion of participants who reported ever visiting a health facility to receive sexual and reproductive health services was 61.0%, with 65.3% reporting ever feeling comfortable at the health facility during provision of sexo-reproductive health services. We equally found that participants reporting that they felt confidentiality was respected at the health facility providing sexo-reproductive health services was 62.7%. Cameroon could benefit from youth friendly health facilities that enhance liberal and open access contraception policies to reduce adolescent pregnancies and adolescent births. Cameroon could learn from the policies of countries like Switzerland and Slovenia, where young people have access to a wide range of contraception services, and record very low rates of teen pregnancy, 0.9% and 0.12% respectively [34].

4.10 Cameroon and HIV Infection

Cameroon successfully rolled back HIV infections especially as the prevalence decreased from 5.1% in 2010 [35] to 3.4% in 2018 [36]. Evidence suggests that the decline in multi-partner sexual behaviour in one of the correlates of the decline in HIV infections [37]. However our data suggests that 81.1% of the study respondents had sexual relationships with multiple partners in the past 12 months, a trend that would seem to undermine government's efforts in preventing HIV transmissions. Nonetheless, our findings present an opportunity for new and creative prevention approaches that specifically target young semi-urban/rural adolescents in low resource settings. Cameroon has one of the youngest and most youthful populations with 61.95% of the 24.9 million Cameroonians aged between 0 ± 24 years [38]. Therefore, specific sexo-reproductive health schemes including HIV prevention

initiatives especially from a Mhealth perspective targeting young people in semi-urban/rural areas are a direct investment to a productive and future workforce of a nation.

5. Conclusions

This study has explored current sexo-reproductive health determinants among adolescent girls in the Kumbo West Health District. Adolescent girls' sexo-reproductive health remains a challenge in Cameroon with significant barriers such as poor sexo-reproductive health knowledge, risky sexual behaviours, insufficient education on sexo-reproductive health, stigma and inaccessibility of seeking sexo-reproductive services etc. To address these barriers, a comprehensive and harmonised sexo-reproductive health system that is easily accessible, youth friendly and affordable, and which takes into account local socio-cultural contexts is urgently needed. Such a system needs to incorporate robust mhealth sexo-reproductive health education in the community such that parents/guardians will be active in the process. A functional mobile adolescent sexo-reproductive health scheme with adequate resourcing would be of benefit to all Cameroonians.

Declarations

Ethics Approval and Consent to Participate

All the principles of a good ethical research were respected. Ethical approval was obtained from the Institutional Review Board of the Faculty of Health Sciences of the University of Buea.

Consent for Publication

Not applicable

Availability of Data and Material

Not applicable

Competing Interests

The authors declare that they have no competing interests

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Authors' Contributions

FSW and DSN developed the study conception and design. FSW, DSN, ON, JBB wrote the manuscript and contributed in the analysis and interpretation of the data. DSN and ON contributed in the critical revision of the intellectual content of the manuscript. All the authors read and approved the final manuscript.

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