

ORIGINAL RESEARCH ARTICLE

Evaluation of a Sexual and Reproductive Health Education Programme: Students' Knowledge, Attitude and Behaviour in Bolgatanga Municipality, Northern Ghana

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Abstract

Evaluation research concerning the impact of sexual and reproductive health (SRH) education in sub-Saharan Africa is scarce. This study obtained more insight into the knowledge, attitudes and behavioural intentions of students concerning SRH in Bolgatanga municipality in northern Ghana, and studied the effects of an SRH programme for this group. This quasi-experimental study used a pre-post-intervention design, with an SRH programme as intervention. A questionnaire was filled in by 312 students before, and by 272 students after the SRH programme. The results showed that before the programme, students answered half of the knowledge questions correctly, they thought positively about deciding for themselves whether to have a relationship and whether to have sex, and their intentions towards SRH behaviour, such as condom use were positive. The SRH intervention led to a small but significant increase in the students' knowledge. It was also found that the attitude of the students aged 18-20 significantly improved. Finally, it was found that female students aged 18-20 were more positive towards changing their behaviour after following the SRH programme. It can be concluded that the impact of the SRH programme in general was positive. Significant effects were found for gender and age. (*Afr J Reprod Health* 2015; 19[3]: 126-136).

Keywords: Adolescents, Intervention, Sex Education

Résumé

Les études d'évaluation de l'impact de l'éducation concernant la santé sexuelle et de la reproduction (SSR) en Afrique subsaharienne sont rares. Cette étude a obtenu plus de perspicacité dans les connaissances, les attitudes et les intentions du comportement des élèves à l'égard de la SSR dans la municipalité de Bolgatanga au nord du Ghana. Elle a étudié aussi les effets d'un programme de la SSR pour ce groupe. Cette étude quasi-expérimentale s'est servie d'une conception pré-post-intervention, avec un programme de la SSR comme une intervention. Un questionnaire a été rempli par 312 étudiants avant, et par 272 étudiants après le programme de la SSR. Les résultats ont montré qu'avant le programme, les étudiants ont donné les bonnes réponses à la moitié des questions sur les connaissances. Ils ont considéré positivement le fait de décider eux-mêmes la possibilité d'avoir ou de ne pas avoir une relation et d'avoir des relations sexuelles ; en plus, leurs intentions à l'égard du comportement de la SSR, telles que l'utilisation du préservatif ont été positives. L'intervention de la SSR a conduit à une petite augmentation mais significative dans la connaissance des étudiants. Il a été constaté également que l'attitude des étudiants ayant de 18-20 ans avait nettement améliorée. Enfin, il a été constaté que les étudiantes ayant 18-20 ans étaient plus positives envers la modification de leur comportement après avoir suivi le programme de la SSR. L'on peut conclure que l'impact du programme de la SSR était en général positif. Des effets significatifs ont été trouvés pour les sexes et l'âge. (*Afr J Reprod Health* 2015; 19[3]: 126-136).

Mots-clés: adolescents, intervention, éducation sexuelle

Introduction

In Ghana, 37% of girls and 22% of boys aged 15-19 years have ever been sexually active, with a median age at first sexual intercourse of 18 years for girls and 20 years for boys¹. Sexually active Ghanaian youths do not use contraceptives

consistently: only 25% of girls and less than 40% of boys (15-19 years) reported condom use at last sexual intercourse. This puts them at risk for sexually transmitted diseases (STIs), including HIV/AIDS, and unintended pregnancies². The national HIV prevalence is relatively low in Ghana compared to other sub-Saharan African countries:

in 2013, it was 1.3% among adults and 0.4% among youths aged 15–24 (a decline from 1.7% in 2011)^{3,4}. Ghana is still considered a high-risk country, however, because at least 14% of men and 2% of women engage in multiple sexual partnerships, knowledge of HIV/AIDS and condom use is relatively low, and neighbouring countries have high levels of HIV/AIDS⁵. HIV in Ghana is mostly transmitted through unprotected heterosexual contact, and it is estimated that 90% of new infections occur among people aged 15–39⁶. Further, STIs and STI symptoms were self-reported in 2008 by females (26%) and males (8%) aged 15–24 years⁷. In 2008, 13% of girls (15–19 years) were pregnant or had children². STIs and unintended pregnancies have adverse consequences for the youths' health, and can also cause stigmatization, school dropout and forced marriages^{7–9}.

The Ghanaian government responded to the onset of HIV/AIDS by introducing prevention programmes, such as media campaigns promoting the ABC strategy (Abstain, Be faithful or use a Condom)¹⁰. Nowadays, schools and private organizations in Ghana run programmes to educate youths in various SRH issues. These programmes contribute to the improvement of the youths' knowledge, attitudes and behaviour regarding SRH to varying extents^{11–15}. Previous studies examined Ghanaian youths' attitude and behaviour regarding SRH^{1,2,16}. However, evaluation research concerning the impact of SRH education in sub-Saharan Africa, and in Ghana in particular, is scarce^{12,13,15}.

The Youth Harvest Foundation Ghana (YHFG) runs an SRH programme for students at schools in Bolgatanga municipality in northern Ghana. The aim of the present study was to obtain more insight into the knowledge, attitudes and behavioural intentions of students concerning SRH in the specific context of Bolgatanga municipality, and to study the effects of an SRH programme on this group.

Method

Design

This quasi-experimental study was carried out with independent pre- and post-intervention

measurements. For the first research aim, the pre-intervention measurements were used cross-sectionally; for the second, the scores of independent experimental groups at pre- and post-intervention measurement were used.

Although under Dutch and Ghanaian law ethical approval was not needed for this study^{17,18}, Ghana Health Service, Ghana Education Service in the Upper East Region, and the Navrongo Health Research Center (NHRC) were officially informed and consulted. The research proposal was also discussed with and approved by the YHFG (organization in Bolgatanga providing SRH education to youths).

Setting

Bolgatanga municipality (132,000 inhabitants) is the capital of the Upper East Region in northern Ghana, which has more than one million inhabitants, 24% of whom are aged 10–24 years. This region, together with the Upper West and Northern Region, is one of the three poorest regions in Ghana. They are mainly rural, the main source of income is farming, and school attendance and literacy rates are lower than elsewhere in Ghana¹⁹. In the Upper East Region, 48% of women and 47% of men aged 15–24 years are literate. It was also reported that only 28% of children of secondary school age (>11) attend secondary education or higher, exact ages were not indicated²⁰.

In Bolgatanga municipality, most people are members of the ethnic group Frafra, a subgroup of the Mole-Dagbani. Information about religious backgrounds in the municipality is only available from 2000; Traditionalism (practised by 53% of the population), Christianity (36%) and Islam (9%). It is however notable that in the Upper East Region Christianity has increased from 28% in 2000 to 42% in 2012. Traditionalism had decreased from 46% in 2000 to 28% in 2012 and Islam increased from 23% in 2000 to 27% in 2012^{19,21}. A comparable development is expected in Bolgatanga municipality.

The municipality has 52 junior high schools (10,100 students), five senior high schools (approximately 4,200 students) and two vocational schools (approximately 100 students)^{22,23}. Students

at the junior high and vocational schools are mainly locals from Bolgatanga municipality. The majority of the students at the senior high schools come from various municipalities and regions; and live on campus during term time. The students' knowledge and practices concerning SRH are relatively lower in Bolgatanga municipality than the national average, and they are less familiar with family planning methods²⁴.

Sample

Junior high, senior high and vocational schools where YHFG taught their SRH programme during data collection were included. The sample comprised first-year students at three junior high and three senior high schools, and first- and second-year students at two vocational schools in Bolgatanga municipality.

SRH Programme

The SRH programme has been provided in Bolgatanga municipality since 2007 at junior high, senior high and vocational schools. The programme's main goal is 'promoting the SRH and rights of adolescents and make a positive contribution to their healthy development into adulthood, particularly by providing accurate information to young people, supporting their advocacy activities for their rights and access to youth-friendly services'²⁵.

Ghanaian employees of YHFG and foreign volunteers developed the programme and the corresponding manual. The programme consists of 16 lessons given in English (Table 1). The lessons take 45-60 minutes and are preferably given every week at the same time to classes of 25-50 students. In each lesson a specific topic is elaborated by providing explanations, definitions and examples. Drawings and pictures are used to explain body parts and genitalia, and a memory cards game is used for the HIV/AIDS lessons. At the end of each lesson there is a discussion based on questions posed by the educators. Students can ask questions at any time. Different contraceptive methods are explained during the family planning lessons, and

male condoms are demonstrated by checking the expiry date, opening the package and rolling the condom onto a wooden 'penis'. The lessons are given by Ghanaian employees/volunteers or by foreign volunteers. Most have a teaching background or experience in social work.

Although the SRH programme is taught at schools, to attend it young people must pay 1.50 Ghanaian cedis (= 0.30 euro) to join the YHFG club. Membership entitles them to go to the SRH lessons and to use the YHFG youth centre facilities (e.g. free access to computers and counselling support by a social worker).

Measures

A questionnaire was developed to measure students' knowledge, attitudes and behavioural intentions concerning SRH. Personal questions (age, religion, ethnic group, sexual experience, familiarity with SRH education) were followed by 27 knowledge statements to be responded to with 'true', 'false' or 'I don't know'. The knowledge statements had an internal consistency of $\alpha = .82$. Next, two attitude statements on decision-making about relationships and sex ($\alpha = .62$) and one attitude statement on FGM, and four statements concerning behavioural intentions ($\alpha = .67$) could be answered on a 4-point scale (do not agree at all, do not agree, agree, totally agree). All statements (see Table 2) were based on the goals of the SRH programme.

Data collection

The questionnaires were distributed before the start of the programme (312 students) and after the end of the programme (272 students). Students from the junior high and vocational schools completed the pre-intervention questionnaire in October 2012 and the post- questionnaire in June 2013 (i.e. within two months after completion of the SRH programme). Students from the three senior high schools completed the pre-intervention questionnaire in January, February and March 2012, and the post-questionnaire in October and December 2012, and May 2013, respectively.

Table 1: SRH Programme

Lesson	Topic	Content
1	Male and female body	Male/female genitals, breasts, personal hygiene.
2	Menstruation	The menstruation cycle, female reproductive organs, 'safe' days, sanitary pads and sex during menstruation.
3	Pregnancy	How to get pregnant, how to prevent pregnancy, teenage pregnancy, pregnancy signs and delivery.
4/5	Family planning	Family planning methods and where to buy them: male/female condom ^a , contraceptive pill, withdrawal, intra-uterine device, contraceptive injection, implants, vaginal spermicides, sterilization/vasectomy, morning-after pill.
6/7	HIV/AIDS	How to prevent/get HIV, what is HIV/AIDS, testing for HIV, people with HIV. Playing the 'LOVE.check game'. ^b
8	STDs	What is and how to get hepatitis B, Chlamydia, gonorrhoea, genital herpes, syphilis, genital warts. What are their symptoms, how and where to test.
9	Male circumcision and wet dreams	Male circumcision, wet dreams and myths.
10	Female genital mutilation	FGM, the consequences and Ghanaian law.
11	Abortion	Abortion, safe and unsafe methods, risks, and legal reasons for abortion.
12	Relationships and sex	Relationships, falling in love, when to have sex, rights, and myths.
13	Unwanted sex and abuse	Sexual abuse, boundaries and rights. Where to get help.
14	Sexual rights	Definition of sexual and reproductive rights, the right to choose your own partner, and definition of homosexuality.
15	Quiz	Questions to the students about the lesson content.
16	Feedback	Students can give feedback/ask questions to the educators.

*Notes: ^aMale condoms are demonstrated by checking the expiry date, opening the package and rolling the condom onto a wooden penis ^bDeveloped by the WEB.foundation

Table 2: Statements with the Corresponding SRH Lesson Topics

Knowledge (true, false, I don't know)	Corresponding topic SRH lessons
-The best way to wash your genitals (penis/vagina) is with water and soap.	Basics of male and female body
-When a woman urinates, her urine comes out of her vagina.	Basics of male and female body
-When a woman gives birth, the child comes out of her vagina.	Basics of male and female body
-The testicles of a man produce sperm.	Basics of male and female body
-The first menstruation of a girl is a sign that she can become pregnant after sexual intercourse with a man.	Menstruation
-During the menstruation period of a woman, blood comes out of her vagina for about 3 to 5 days.	Menstruation
-When a girl is having her period (she's bleeding) she cannot become pregnant.	Menstruation
-Women can use sanitary pads during their menstruation period.	Menstruation
-Unsafe or induced abortions <u>cannot</u> cause infertility of a woman.	Abortion
-Examples of unsafe abortions are putting herbs, leaves or stones in the womb.	Abortion
-In certain circumstances it is legal in Ghana to have an abortion in a hospital or health clinic.	Abortion
-You can get condoms at pharmacies, supermarkets and family planning clinics.	Family planning
-You can get HIV by using the same toilet as an HIV infected person.	HIV/AIDS
-A condom can never expire.	Family planning
-When a person is HIV infected, you can always notice it from the outside.	HIV/AIDS
-Having sex with a condom protects you for sexual transmitted diseases (STDs).	Family planning/STDs
-Circumcision of a woman (Female Genital Mutilation) is allowed by law.	Female circumcision
-A circumcised woman can have serious difficulties with urinating and giving birth.	Female circumcision
-For men it is necessary to have his penis circumcised.	Male circumcision and wet dreams
-Boys can have 'wet dreams' in the night, when semen comes out of the penis unexpectedly.	Male circumcision and wet dreams
-All people in Ghana have the right to use contraceptive methods.	Sexual rights
-A woman <u>cannot</u> become pregnant when the man does not ejaculate in the womb (withdrawal)	Pregnancy
-When a woman is pregnant, it is not good for the foetus to have sex.	Pregnancy
-The right time to have a sexual relationship is when all your friends also have it.	Relationships and sex
-In a boyfriend/girlfriend relationship you need to have sexual intercourse.	Relationships and sex/Sexual rights
-Not everybody has the right to choose his/her own marriage partner.	Sexual rights
-A woman cannot refuse sex to her husband.	Sexual rights

Attitudes (do not agree at all, do not agree, agree, totally agree)

Deciding for yourself to have a relationship and sex:

-I think that I should decide for myself whether I want to have a boyfriend or girlfriend.

-I think that I should decide for myself whether I want to have sex or not.

Practice of FGM:

-I think Female Genital Mutilation (circumcision of women) should not be practiced again

Behavioural intention (do not agree at all, do not agree, agree, totally agree)

-I think that I will always use a condom when I have sex before marriage

-I think that I will always use a condom when I have different sex partners

-I think I will use the ABC strategy in my relationships (Abstain, or Be faithful, if not use Condom).

-I think that I will test myself for sexual transmitted diseases (STDs) if I had unsafe sex.

Relationships and sex

Sexual rights

Female circumcision

Family planning, HIV/AIDS and STDs

Data analysis

Data from the questionnaires were processed and analysed in SPSS 20.0. Statistical significance was established at an alpha level of 0.05. Descriptive statistics were used to present the students' mean scores on knowledge, attitudes and behavioural intentions before the intervention. We conducted analyses of variance (ANOVAs) to explore differences between subgroups. Based on the literature, gender, age, sexual experience and religion were initially chosen as independent variables^{6,10,13}, as was previous SRH education. We did not include sexual experience or religious groups with the other variables in the ANOVAs, as too few students reported them. ANOVAs were therefore done with the variables gender, age and previous SRH education. For the variable age, three age groups were composed: 12-14, 15-17 and 18-20 years. Two students aged 10 and five students aged 21 or above were excluded. Separate ANOVAs were performed for the three religions (Traditionalism, Islam and Christianity) and for sexual experience. Post-hoc comparisons were done using the Tukey test.

The students' mean scores on knowledge, attitudes and behavioural intentions in the pre- and post-intervention measurements were then compared. ANOVAs were used with the variables pre- or post-intervention measurement, gender and age group (12-14, 15-17, 18-20). Since the pre- and post-intervention measurement could only be paired for 28 respondents, the measurement was included as a between-subjects factor. Main effects were tested only for the variable pre- or post-intervention measurement, because main effects are not relevant for the mean of the scores on pre- and post-measurement for gender and age. Interaction effects were tested for all three

variables. Sexual experience was not included with the other variables because of the small size of the subgroups, and because in the pre-measurement no significant differences were found between students who were sexually experienced and those who were not.

Results**Demographics**

The pre-intervention questionnaire was completed by 110 male students (35%) with a mean age of 15.9 years (range 10-19 years), 187 female students (60%) with a mean age of 16.7 years (range 10-23 years) and 15 students (5%) who did not provide gender information. Sample (n=312) characteristics are summarized in Table 3.

Table 3: Background Variables

Students (n=312)	Number (%)
Sex	
Male students	110 (35%)
Female students	187 (60%)
Missing values	15 (5%)
Mean age (age range)	
Total	16.4 (10-23 years)
Male students	15.9 (10-19 years)
-12-14 years	30 (28%)
-15-17 years	53 (49%)
-18-20 years	26 (24%)
Female students	16.7 (10-23 years)
-12-14 years	32 (18%)
-15-17 years	80 (45%)
-18-20 years	66 (37%)
Religion	
Christianity	231 (74%)
Islam	56 (18%)
Traditionalism	15 (5%)
Missing values	10 (3%)

Ethnicity	
Frafra	144 (46%)
Kusasi	18 (6%)
Kassena	9 (3%)
Bissa	9 (3%)
Mole-Dagbani	5 (2%)
Other ethnic group*	42 (14%)
Missing values	85 (27%)
School level	
Junior high school	183 (59%)
-Male students	77 (25%)
-Female students	91 (29%)
Senior high school	89 (29%)
-Male students	33 (11%)
-Female students	56 (18%)
Vocational education (all females)	40 (13%)
Previous SRH education	
Yes	89 (29%)
No	219 (70%)
Missing values	4 (1%)
Ever been sexually active	
Yes	59 (19%)
-Male students	26 (8%)
-Female students	32 (10%)
No	249 (80%)
-Male students	82 (26%)
-Female students	155 (50%)

*30 other ethnic groups were mentioned

Pre-intervention measurement

Knowledge

The students answered on average 13.76 of the 27 (51%) knowledge questions correctly. Knowledge differed significantly between gender groups ($F(1, 271) = 6.22, p < .013$): female students gave more correct answers than male students (See Table 4). Significant differences were also found between the age groups ($F(2, 271) = 8.73, p < .000$): students aged 18-20 gave more correct answers than students aged 15-17 and students aged 12-14. Students aged 15-17 also gave more correct answers than students aged 12-14 (See Table 4). There were no significant main effects for the other factors (previous SRH education, sexual experience and religion).

Two significant interaction effects were found for knowledge. There was an interaction between gender and previous SRH education ($F(1, 271) = 8.01, p = .005$): female students who had already received SRH education gave more correct

answers (16.39) compared to male students who had already received SRH education (11.64), and compared to female students (12.59) and male students (12.90) who had not already received SRH education. Secondly, a significant interaction effect was found between age and previous SRH education ($F(2, 271) = 4.23, p = .015$): students aged 15-17 (16.43) and 18-20 (16.28) who had already received SRH education provided more correct answers than their peers aged 15-17 (12.17) and 18-20 (14.83) who had not received such SRH education.

Attitudes

On average, students agreed with the first two attitude statements, namely that they should decide for themselves whether they want to have a relationship (3.06) and want to have sex (3.03). Significant differences were found between the three age groups ($F(2, 268) = 3.96, p = .02$): students aged 15-17 and 18-20 more often agreed with these statements than students aged 12-14 (see table 4). There also was a significant difference between religious groups ($F(2, 295) = 3.28, p = .039$): Christian students agreed more with these statements compared to Traditionalist students (see table 4). No significant differences for gender, other SRH education attended and sexual experience were found.

On average, students agreed with the third attitude statement, namely that female genital mutilation (FGM) should no longer be practiced. A significant interaction effect was found between gender and age group ($F(2, 269) = 3.98, p = .02$). Female students aged 12-14 agreed significantly less (2.79) with this statement compared to female students aged 15-17 (3.02) and 18-20 (2.77); no differences between age groups were found among the male students. There also was a significant interaction effect between gender, age and previous SRH education ($F(2, 269) = 3.18, p = .043$); this, however, was not the case in post-hoc comparisons, possibly because three of the subgroups had few participants (≤ 5). No significant differences for sexual experience and previous SRH education were found.

Table 4: Mean Scores in the Pre-intervention Questionnaire (N=312) and the Effect of the Intervention (pre N=312; post N=272)

	Knowledge (27 questions; mean score of correct answers)	Attitudes (1=do not agree at all; 4=totally agree)		Behavioural intentions (1=do not agree at all; 4=totally agree)
		Two statements: deciding to have a relationship and deciding to have sex.	One statement: FGM should not be practiced again.	Four statements: condom use, ABC strategy and STD testing.
Total	13.76 ^a	6.10	2.92	11.82
Gender				
Male	12.27 ^a	6.03	3.01	12.00
Female	14.49 ^b	6.17	2.64	11.76
Age				
12-14	10.29 ^a	5.11 ^a	2.40	10.10 ^a
15-17	14.30 ^b	6.41 ^b	3.11	12.30 ^b
18-20	15.55 ^c	6.29 ^b	2.97	12.63 ^b
Religion				
Christian	14.16	6.21 ^a	3.00	12.04
Muslim	13.13	5.98 ^{ab}	2.82	11.76
Traditional	11.93	5.07 ^b	2.47	10.33
SRH education				
Yes	16.69 ^a	6.72 ^a	3.36 ^a	13.11 ^a
No	12.59 ^b	5.85 ^b	2.74 ^b	11.27 ^b
All students				
Pre-measurement	13.47*	6.10	2.92	11.82
Post-measurement	14.64*	6.33	2.97	12.23
Females				
Pre-measurement	14.51*	6.17	2.94	11.76*
Post-measurement	16.26*	6.47	3.06	12.51*
Students 15-17 years				
Pre-measurement	13.73*	6.40	3.10*	12.19
Post-measurement	15.15*	6.14	2.83*	11.52
Students 18-20 years				
Pre-measurement	15.49*	6.09*	2.90*	12.10*
Post-measurement	17.08*	7.02*	3.29*	13.46*

*Means that do not share the same superscript differ, $p < 0.05$

Behavioural intentions

Students on average agreed that they would always use a condom if they had multiple sex partners (3.07) and would be tested for STIs if they had had unsafe sex (3.03). Students moderately agreed that they would always use a condom if they had sex before marriage (2.76), and that they would use the ABC strategy (Abstain, Be Faithful or use a Condom) in their relationships (2.92). There was a significant difference between the age groups ($F(2, 254) = 4.68, p < .01$): students aged 15-17 and 18-20

agreed more than students aged 12-14 with all four of the abovementioned behavioural intention statements (see table 4). No significant interaction effects were found. There were no significant differences for gender, sexual experience or previous SRH education.

Effect of the intervention

The post-intervention questionnaire was completed by 272 students. A chi-square test

indicated no significant differences in gender, age and religion between these respondents and those who completed the pre-intervention questionnaire. Significantly more students reported, however, ever being sexually active in the post-intervention questionnaire (27%) compared to the pre-intervention questionnaire (19%) ($X^2(1, N = 576) = 4.42, p = .036$). The post-intervention questionnaire asked students to state how many SRH lessons they had attended. Although 52 answered 'none' and 88 students did not give an answer, all 272 students were included in the analyses in accordance with the 'intention to treat' principle. Because students who were present and who received a questionnaire should have participated in the programme.

A main effect was found for the difference between pre- and post-intervention scores concerning knowledge: students gave significantly more correct knowledge answers (14.64; 54%) in the post-intervention questionnaire compared to the pre-intervention questionnaire (13.47; 50%) ($F(1, 491) = 5.65, p = .018$) (see table 6). This effect is small ($\eta_p^2 = .011$). No interaction effects were found for gender and age. For the attitude statements about having a relationship and having sex, no main effect was found for intervention.

A significant interaction effect was found between intervention and age group ($F(2, 485) = 4.24, p = .015$). This effect is small ($\eta_p^2 = .017$). Post-hoc analyses showed a significant increase only for students aged 18-20 between the pre- and the post-intervention measurement (table 4). For the attitude towards FGM, no main effect was found for intervention, but there was a significant interaction effect of intervention and age group ($F(2, 488) = 3.46, p = .032$). This effect is small ($\eta_p^2 = .014$). Post-hoc analysis showed, however, no significant differences.

The mean scores on the four behavioural intentions statements showed no main effect for intervention, but a significant interaction effect between intervention and age group ($F(2, 459) = 3.48, p = .032$) was found. This effect is small ($\eta_p^2 = .015$). Post-hoc analysis showed a significant difference for students aged 18-20 between the pre- (12.10) and the post-intervention measurement (13.36), indicating more positive intentions after the programme. The significant

interaction effect between the variables pre- or post-intervention measurement, age group and gender ($F(2, 459) = 4.31, p = .014$) showed that the increase in scores occurred only in the female students aged 18-20 between pre- (6.09) and post-measurement (7.02). This effect is small ($\eta_p^2 = .018$).

As mentioned, not all students stated in the post-intervention questionnaire that they had attended the SRH programme. Therefore, separate analyses were performed with all students who had stated that they had attended ('analysis per protocol'; $n=132$). These analyses also showed a significant difference only for the knowledge questions between the pre-intervention (13.76) and the post-intervention measurement (14.95) ($F(1, 440) = 5.34, p < .021, \eta_p^2 = .12$), and not for attitude or behavioural intentions.

Discussion

This study focused on the knowledge, attitudes and behavioural intentions of students concerning SRH in Bolgatanga municipality, and the effects of an SRH programme for this group.

Knowledge, attitudes and behavioural intentions before the SRH programme

Students answered on average half of the knowledge questions correctly before the SRH programme. This concurs with other research that has shown that Ghanaian adolescents' specific knowledge about SRH is inadequate, despite their awareness of the existence of HIV, pregnancy and contraceptives¹⁶. Although knowledge is not sufficient to effect behaviour change, it is often seen as a necessary condition¹⁵.

The students thought positively about deciding for themselves whether to have a relationship and whether to have sex. This is promising in the light of findings that there is some peer pressure among youths to be involved in a relationship and to be sexually active within relationships^{8,26}. Students' negative attitude towards FGM is also promising. According to several sources, FGM is harmful and unwanted but is an on-going cultural practice in the research area²⁷. The students' negative attitude towards it might help to decrease its prevalence. Previous

research showed that condom use is low among Ghanaian youths, and the majority reported barriers to being tested for STIs^{2,16}. It is therefore encouraging that students' behavioural intentions regarding condom use and being tested for STIs are positive. Positive behavioural intentions could lead to positive changes in actual behaviour. This depends on the opportunities students have 'to decide at will to perform or not perform' their behaviour and on various non-motivational factors, such as the availability and affordability of condoms and STI testing and their skills in using condoms^{28,p.182}. More research on such non-motivational, facilitating factors to use condoms and be tested for STIs is required.

The students were mostly positive regarding the behavioural intention to use the ABC strategy. This could be a result of the government's promotion of the ABC strategy to prevent HIV/AIDS⁸. However, the effectiveness of the strategy has received a great deal of criticism over the years, in northern Ghana and worldwide⁶. Abstaining from sex or using condoms correctly might help to prevent the spread of STIs, but pregnancies cannot be prevented through faithfulness to one's partner, and faithfulness protects against STIs only if both partners are faithful.

That older students (≥ 15 years) had more knowledge and more positive attitudes and behavioural intentions than younger students (≤ 14 years) might be a result of their being more sexually experienced²⁹ and having higher levels of self-efficacy and exposure to life events. In addition, there is evidence that the stages of sexual development in youths influence the impact of programmes¹⁵. Furthermore, the SRH programme appears to have a greater influence on the attitudes and behavioural intentions of the older students (18-20 years), which contradicts previous findings¹⁵. It concurs, however, with previous research among the same population: students attending senior high and vocational schools more often agreed that the SRH programme helped them to make the right choices for the future regarding SRH, compared to average younger junior high school students³⁰.

The pre-intervention questionnaire revealed gender differences for knowledge, but not for

attitudes and behavioural intentions, and not for the impact of the intervention. This contradicts other research¹².

Effects of the intervention

The results indicate that the intervention led to a small increase in the students' knowledge, an improved attitude among students aged 18-20 and improved behavioural intentions among female students aged 18-20. Effect changes in knowledge and attitude seem to be relatively easy to achieve, but effect changes in intentions and behaviour are more challenging¹³. The limited effect of the programme could be explained by the fact that not all students attended all lessons, that educators experienced barriers during the implementation of the SRH programme evaluated in the current study³⁰ and that foreign volunteers who might not understand the culture-related implications of students' questions educate the SRH programme. Nevertheless, the effects were significant. The programme contributed to the students' knowledge and had impact on their attitude and behavioural intentions. The limitedness of the impact might show that behavioural changes – in this case with regards to safe sex – are possible but difficult to accomplish. It might take time and repeated efforts.

Strengths and Limitations

Strength of this study is that it was carried out in sub-Saharan Africa, where evaluation research on the effects of SRH interventions is important, but scarce¹². In addition, the sample was large and included students from different schools and educational levels. The number of Traditionalist and Muslim participants, however, was relatively small compared to the number of Christian students.

The study also had limitations. The design was quasi-experimental and non-randomized. Only 28 students could be paired between the pre- and post-measurement, because background variables were missing or incorrect. Therefore, pre-/post-intervention comparisons were conducted on the basis of an independent groups design, which has relatively less power than repeated-measures designs³¹. Initially, control

groups at junior high and senior high schools were selected, but due to practical reasons their post-intervention questionnaires were not conducted at the same time compared to the experimental group, and were therefore not included in the analysis.

In the sample, there might have been a selection bias; only students who were interested in the SRH programme and did have 1.50 Ghanaian cedis (= 0.30 euro) to join the YHFG club were included. In addition, different educators delivered the programme to the students. Whether the individual educators had influenced the students' scores, however, was not analysed. Finally, there were more sexually experienced students in the post-measurement (27%) compared to the pre-measurement (19%), which might have influenced the students' scores in the post-measurement. In the pre-measurement, however, no significant differences were found between students who were sexually experienced and those who were not. Moreover, the sexual experience in the pre-measurement could be underreported due to the cultural taboo on premarital sex³⁰.

Conclusion

In this study on student's knowledge, attitudes and behaviour towards SRH, the knowledge of the students was limited; however, they had a positive attitude and positive intentions towards SRH behaviour, such as condom use. This was found for both male and female students. It was also found that they had a negative attitude towards FGM. The evaluation of the SRH programme showed that this intervention led to a small but significant increase in the students' knowledge, that the attitude of the students aged 18-20 significantly improved and that the attitude of younger students remained the same. Female students aged 18-20 were more positive towards changing their behaviour after following the SRH programme, whereas that of male students remained the same. All in all, the impact of the SRH programme was positive. Significant effects were found for gender and age.

Implications

In the development and delivery of SRH

programmes, it should be considered that students' limited knowledge of SRH has increased after attending the SRH programme, and that the programme contributed to an increase of the students' attitudes and the behavioural intentions of females. Changes in knowledge, attitude and behaviour regarding SRH are possible but difficult to accomplish, this might take time and repeated efforts. Age should be taken into account as an important factor in order to tailor SRH programmes to younger and older students. This could be accomplished by varying the level of complexity, and using different participatory learning techniques. Further, more research is required on especially non-motivational factors such as the availability and affordability of condoms and STI testing, and their skills in using condoms. Lastly, the findings of the current study concerning gender contradict other research to some extent. Further research might provide more insight into gender differences in response to SRH interventions.

Contribution of Authors

All authors contributed to the design of the study, the analysis of the data and the preparation of this paper. The first author supervised the data collection. All authors approved this paper.

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