

Secondary school students' awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk in Dar es Salaam, Tanzania

Nishihara Mika

Nagasaki University

Leshabari Sebalda

Muhimbili University of Health and Allied Sciences

Tanaka Junichi

Nagasaki University

Mayumi Ohnishi (✉ mohnishi@nagasaki-u.ac.jp)

Nagasaki University <https://orcid.org/0000-0002-1207-9575>

Research

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Abstract

Background To assess awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV risk among secondary school students in Tanzania.

Methods An anonymous self-administered questionnaire survey was conducted among secondary school students in 2017 in Tanzania. The questionnaire included sociodemographic characteristics, awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk. Three secondary schools in Dar es Salaam were selected considering gender balance and location, which included urban and surrounding areas. After the research objectives, methods and ethical considerations were explained, the students voluntarily completed and submitted the questionnaire in the designated place. Submission of the questionnaire was considered agreement to participate in the study.

Results A total of 233 responses were collected, and 204 responses were valid for the analysis. The mean and standard deviation of age were 18.5 ± 1.0 . Spearman's rank correlation coefficient between understanding of HIV/AIDS prevention and perception of HIV/AIDS risk was $\rho=0.184$ ($P=0.036$). However, there was no correlation between awareness of contraceptive methods and understanding of HIV/AIDS prevention ($\rho=0.019$, $P=0.782$) or perception of HIV/AIDS risk ($\rho=-0.138$, $P=0.116$). Regardless of gender, age, religion, and major course of study, mother's educational status ($\beta=0.150$, $P=0.031$ and $\beta=0.232$, $P=0.034$, respectively) and the number of information sources ($\beta=0.584$, $P<0.001$ and $\beta=-0.311$, $P=0.006$, respectively) demonstrated associations with awareness of contraceptive methods and perception of HIV/AIDS risk. Respondents who lived outside of a dormitory ($\beta=0.295$, $P=0.001$) and currently had a partner ($\beta=0.243$, $P=0.009$) demonstrated a higher understanding of HIV/AIDS prevention regardless of gender, age, religion, and major course of study.

Conclusions The factors associated with awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk were not consistent. To improve awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk among secondary school students, educational programs should be integrated and holistically provided as sexual health education.

Plain English Summary

This study was aimed to assess awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV risk among secondary school students in Tanzania. An anonymous self-administered questionnaire survey was conducted among secondary school students in Dar es Salaam, Tanzania. The questionnaire included sociodemographic characteristics, awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk. A total of 233 responses were collected, and 204 responses were valid for the analysis. Spearman's rank correlation coefficient between understanding of HIV/AIDS prevention and perception of HIV/AIDS risk was $\rho = 0.184$ ($P = 0.036$). However, there was no correlation between awareness of contraceptive methods and

understanding of HIV/AIDS prevention ($\rho = 0.019$, $P = 0.782$) or perception of HIV/AIDS risk ($\rho = -0.138$, $P = 0.116$). Regardless of gender, age, religion, and major course of study, mother's educational status ($\beta = 0.150$, $P = 0.031$ and $\beta = 0.232$, $P = 0.034$, respectively) and the number of information sources ($\beta = 0.584$, $P < 0.001$ and $\beta = -0.311$, $P = 0.006$, respectively) demonstrated associations with awareness of contraceptive methods and perception of HIV/AIDS risk. Respondents who lived outside of a dormitory ($\beta = 0.295$, $P = 0.001$) and currently had a partner ($\beta = 0.243$, $P = 0.009$) demonstrated a higher understanding of HIV/AIDS prevention regardless of gender, age, religion, and major course of study. The factors associated with awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk were not consistent. To improve awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk among secondary school students, educational programs should be integrated and holistically provided as sexual health education.

Background

According to recent research, among adolescent and young women aged 15–23 years in Tanzania, 75.5% were sexually active [1]. Adolescents and young adults (AYA) in Tanzania engage in high-risk sexual behaviors, including sexual activities with multiple sexual partners and inconsistent use of condoms, and they have adverse experiences, such as unwanted pregnancy [2]. More than half of the most recent pregnancies and/or births among East African adolescent girls aged 15–19 years were unintended, and educational attainment, age at first sexual experience, household wealth, family structure and exposure to media were significantly associated with adolescent pregnancy [3]. Among unmarried sexually active women aged 15–19 years in Tanzania, educational status, opportunities to learn about modern contraception, perceived partner and/or friend support for contraceptive use, higher knowledge and self-efficacy for contraceptives were associated with modern contraceptive use [4]. Another study in Tanzania reported that being female and social cohesion, including social trust and social participation, were related to condom use among school-aged AYA aged 14–19 years [5]. However, a study from Zimbabwe reported that contraceptive use is very low, although knowledge about modern contraceptives is universal among adolescents [6]. There are several views and study findings regarding relationships between knowledge and behaviors with respect to sexual and reproductive health; inconsistent results have been obtained because other factors such as social norms and stigma may play protective roles, preventing behavior that would lead to adverse outcomes.

Several educational programs on sexual and reproductive health for AYA have been implemented, and these programs demonstrated effectiveness in increasing knowledge and understanding immediately after and/or in the short term [7]. Tanzanian female undergraduate students stated low utilization of contraceptive methods, although they had knowledge about methods [8]. A supportive approach is required for AYA to help them take appropriate action to avoid unwanted pregnancy and HIV infection by promoting sexual and reproductive health.

This study aimed to assess the factors associated with awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV risk among secondary school students in Tanzania. The findings from this study will provide information on current positive factors and constraints to implementing a combined program for preventing unintended pregnancy and HIV infection among AYA in Sub-Saharan African countries, including Tanzania.

Methods

Study procedure

An anonymous, self-administered questionnaire survey was conducted among secondary school students as a cross-sectional study in August 2017 in Dar es salaam, Tanzania. Three secondary schools in Dar es Salaam were selected considering the gender balance and location, which were urban and surrounding areas.

After the research objectives, methods and ethical considerations were explained, the students voluntarily completed and submitted the questionnaire in the designated place. Submission of the questionnaire was considered to indicate agreement for research participation. Confidentiality was guaranteed by ensuring the participants' anonymity. Withdrawal from the study was an option for respondents at any time.

Measurements

The questionnaire included sociodemographic characteristics (gender, age, religion, mother's educational status, current living conditions, and currently having a partner), awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk in English. Awareness of contraception was obtained from data with 11 items; respondents chose all options for which they had knowledge. The score for overall awareness of contraception was calculated by summing the "yes" answers for each item, with a range of 0 to 11. Understanding of HIV/AIDS prevention was evaluated with two questions: can people reduce their chance of getting HIV by having just one uninfected sex partner who has no other sex partner? Can people reduce their chance of getting HIV by using a condom every time they have sex? Appropriate responses were scored as 1, and inappropriate responses or don't know/no response were scored as 0. The score for overall knowledge of understanding HIV/AIDS prevention was calculated by summing the appropriate answer for each item with a range of 0 to 2. Perception of HIV/AIDS risk was rated on a 5-point Likert scale ranging from 1 (not at all) to 5 (a great deal) using the question, "How much at risk do you consider yourself from HIV/AIDS?"

Analysis

IBM SPSS version 25 was used to analyze the data. A chi-square test was performed to assess differences in gender and awareness of contraceptive methods and the type of information obtained from information sources. A t-test or ANOVA was used to assess the association between demographic characteristics and awareness of contraceptive methods, knowledge of HIV/AIDS prevention, and perception of HIV/AIDS risk. Spearman's rank correlation coefficient was used to measure the association between contraceptive methods, knowledge of HIV/AIDS prevention, and perception of HIV/AIDS risk. Linear regression analysis was used to determine the factors associated with contraceptive methods, knowledge of HIV/AIDS prevention, and perception of HIV/AIDS risk. In all analyses, $P < 0.05$ was used to indicate statistical significance.

Ethical approval

This study was approved by the Ethics Committees of Nagasaki University in Japan (approval number: 16012877) and Muhimbili University of Health and Allied Sciences in Tanzania. Three selected secondary schools approved the research proposal and agreed to allow the study to be conducted at the schools.

Results

A total of 233 responses were collected, and 204 responses were valid for the analysis. Only 131 respondents reported perceptions of HIV/AIDS risk. Table 1 shows the sociodemographic characteristics of the respondents. The mean and standard deviation (SD) of age were 18.5 ± 1.0 . The majority of respondents were female, Catholic/Christian, took art or nonscience courses, and lived outside of the dormitory.

Table 2 shows the frequency of awareness of contraceptive methods. Among 204 respondents, 196 respondents stated their awareness of contraceptive methods. The most popular method was the male condom, which was known by 77.0% respondents. Only 19.1% of respondents reported awareness of emergency contraception. There was no statistically significant difference between gender and awareness of contraceptive methods.

Table 3 presents information sources regarding sexual and reproductive health, including contraceptive methods, sexually transmitted infections and HIV/AIDS, as well as the most useful information source. Television (72.1%) and teachers (69.2%) were the most accessible information sources, but the internet websites (30.5%) were the most useful information sources. There was no statistically significant difference between gender and having information sources or the most useful information source. The mean number of information sources was 4.6 ± 2.9 among male respondents and 4.5 ± 2.8 among female respondents (t-test, $P = 0.834$).

Table 4 reports information that the respondents obtained from the information sources mentioned in Table 3. Information related to sexually transmitted infections and HIV/AIDS was the most common content obtained regardless of gender (male: 74.6%, female: 78.3%, chi-square test, $P = 0.567$).

Information regarding pregnancy was more likely to be obtained by females (43.5%) than males (27.0%), with a statistically significant difference (chi-square test, $P = 0.023$), although information related to contraceptive methods did not show a significant difference by gender (male: 39.7%, female: 42.8%, chi-square test, $P = 0.682$).

Awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk by sociodemographic characteristics among secondary school students are presented in Table 5. Awareness scores for contraceptive methods were higher among respondents with higher maternal educational status (ANOVA, $P = 0.007$). The score for understanding of HIV/AIDS prevention was higher among respondents with art or non-science majors, those who lived outside of the dormitory, and those who had experience with sexual intercourse (t-test, $P = 0.010$, $P = 0.023$, and $P = 0.014$, respectively). The mean and SD of perception score of HIV/AIDS was 2.5 ± 1.8 . The perception scores for HIV/AIDS risk were higher among male respondents (t-test, $P = 0.007$), and there was a significant difference with regard to age (ANOVA, $P = 0.003$), although there was not an orderly difference.

Table 6 presents the correlation between the scores of awareness of contraceptive methods, understanding of HIV/AIDS prevention, perception of HIV/AIDS risk and number of information sources. Spearman's rank correlation coefficient between understanding of HIV/AIDS prevention and perception of HIV/AIDS risk was $\rho = 0.184$ ($P = 0.036$). However, there was no correlation between awareness of contraceptive methods and understanding of HIV/AIDS prevention ($\rho = 0.019$, $P = 0.782$) and the perception of HIV/AIDS risk ($\rho = -0.138$, $P = 0.116$). The number of information sources was related to awareness of contraceptive methods ($\rho = 0.654$, $P < 0.001$), but there was no relationship with understanding of HIV/AIDS prevention ($\rho = 0.065$, $P = 0.361$) and the perception of HIV/AIDS risk ($\rho = -0.168$, $P = 0.057$).

The factors associated with awareness of contraceptive methods, understanding of HIV/AIDS prevention, and the perception of HIV/AIDS risk were examined by linear regression analysis (Table 7). Regardless of gender, age, religion, and major course of study, maternal educational status ($\beta = 0.150$, $P = 0.031$ and $\beta = 0.232$, $P = 0.034$, respectively) and the number of information sources ($\beta = 0.584$, $P < 0.001$ and $\beta = -0.311$, $P = 0.006$, respectively) demonstrated associations with awareness of contraceptive methods and the perception of HIV/AIDS risk. Respondents who lived outside of the dormitory ($\beta = 0.295$, $P = 0.001$) and currently had a partner ($\beta = 0.243$, $P = 0.009$) showed a higher understanding of HIV/AIDS prevention regardless of gender, age, religion, and major course of study.

Discussion

The contraceptive method for which the respondents had the greatest awareness was the male condom. This may be due to promotion and education regarding HIV/AIDS prevention rather than simply the promotion of contraceptive methods. Male condoms constitute an appropriate and affordable contraceptive method among AYA because they prevent HIV infection and unintended pregnancy with nonhormonal methods. Emergency contraception was the method for which respondents had the lowest

level of awareness. Although emergency contraception does not prevent HIV infection, it offers the possibility of avoiding unwanted pregnancy. In this study, male respondents mentioned the perception of a higher risk of HIV. Female respondents obtained information related to pregnancy more often than male respondents because this issue may have been more important to the female respondents. Thus, appropriate knowledge of and access to effective and affordable contraceptive methods including emergency contraception is important for AYA. A previous study also reported that few female undergraduate students knew about emergency contraception [9]. Additionally, female undergraduate students with experience using emergency contraception reported inappropriate use [10]. A study from Tanzania also reported that most female undergraduate students had knowledge of contraception, but the prevalence of the actual use of contraception was not high among sexually active students [11]. It is clear that the promotion of contraceptive methods and the prevention of HIV infection among AYA should be continued [12], although knowledge cannot be the only factor to motivate individuals to use contraception and methods for HIV prevention. Despite low evidence of effective educational program curricula and provision methods, school-based approaches are recommended for AYA [13]. The findings of this study indicate that teachers were the second most common source of information regarding sexual and reproductive health, following television. Although information provided by health professionals to AYA is reliable, AYA may not have access to health facilities. Teachers can play an important role in providing accurate information and knowledge related to sexual and reproductive health for AYA who are in schools.

The findings from this study show that the factors associated with awareness of contraceptive methods, understanding of HIV/AIDS prevention and perceptions of HIV/AIDS risk were not consistent. Having a partner and having experience with sexual intercourse did not contribute to awareness of contraceptive methods and understanding of HIV/AIDS prevention in this study, although currently having a partner was associated with understanding of HIV/AIDS prevention. If there are no specific characteristics of vulnerable groups who require appropriate information and knowledge provision regarding sexual and reproductive health for AYA such as lesbian, gay, bisexual and transgender populations, integrated educational programs about contraception and HIV/AIDS prevention will be required regardless of sociodemographic characteristics. Comprehensive sexual educational programs have been implemented in low- and middle-income countries, but these programs have experienced several challenges with regard to their management and multisectoral coordination [14, 15]. With increased accessibility and use of the internet and/or social media, e-health could be a useful tool for information/knowledge provision; the internet was the most useful information source in this study. Educational programs and interventions related to sexual and reproductive health for AYA have been implemented, including information provision and guidance through the internet and mass media [15]. Studies of mHealth interventions, such as Mobile for Reproductive Health introduced in Tanzania, report that contraceptive methods are one of major types of information accessed [16]. Educational programs that use game-based learning and gamification can also improve sexual health conditions among adolescent students [17]. The findings from this study indicate that students with a greater number of information sources had better awareness of contraceptive methods, but they had an adverse level of perception of HIV/AIDS risk. The number and

variation of information sources can increase simple information and knowledge. However, obtaining appropriate understanding and/or perception may require high-quality information and knowledge, and a large amount of unnecessary and/or inappropriate information/knowledge may affect AYA's understanding and perception. The use of e-health can have positive effects, but careful implementation of e-health programs is required to prevent confusion about finding and selecting appropriate information.

Secondary school students reported that their most frequently used source of sexual and reproductive health information was their teachers [18]. Mass media were the most frequent sources of reproductive health information among 7th-grade primary school adolescents, although the credibility of information from mass media was low, and parents and health workers were more credible sources of information [19]. Contraceptive information from medical health professionals was associated with greater accuracy in knowledge about contraceptive use and efficacy compared to all other sources [20, 21]. Although the provision of sexual and reproductive health information through the internet and/or social media has become popular, the role of medical-health professionals and school teachers is important for the promotion of a healthy sexual and reproductive life among AYA because the credibility of the information obtained and its impact on their behavior are high. AYA also prefer individual and customized approaches provided by medical-health professionals and schoolteachers for their decision making and action related to sexual and reproductive health [21]. It is important to mitigate the negative impacts of information and knowledge obtained from the internet and/or social media on the information and knowledge provided by health professionals and teachers.

In addition, parents are key people to protect the sexual and reproductive health of AYA because parental support is available and reliable for AYA [21, 22, 23]. Despite controversial views, the majority of AYA's parents appreciated school-based comprehensive sexuality education [24]. This study also demonstrated that higher maternal educational status contributed to better awareness of contraceptive methods and perceptions of HIV/AIDS risk. Additionally, living with family members contributed to a greater understanding of HIV/AIDS prevention. A study from Ethiopia reported that AYA who discussed sexual and reproductive health with their parents were more likely to have utilized sexual and reproductive health services [25]. The study also demonstrated that AYA living with their mothers, regardless of whether the father was present, were more likely to have utilized sexual and reproductive health services than AYA living with just their fathers [25]. A study from Uganda also reported that AYA talked more with their mothers than their fathers about sexual and reproductive health issues, although AYA did not frequently talk with either parent about these issues. In addition, female AYA were more likely to talk about sexual and reproductive health than were male AYA [26]. Therefore, it is important to train medical-health professionals and schoolteachers and to provide educational opportunities for parents regarding the provision of accurate information on sexual and reproductive health to their children and in the community.

This study has several limitations. First, the respondents of this study may not be representatives of AYA in urban and rural areas because the influences of social norms and traditional culture in urban and rural

areas may differ. The accessibility and availability of sexual and reproductive health information may also be different from other areas of Tanzania. Second, AYA in and out of school may have different characteristics regarding their health literacy level and sociocultural conditions [27]. AYA who are not in school might have more risky sexual behaviors than AYA who are in school [28]. This study only addressed AYA in school in Tanzania; therefore, it is not appropriate to generalize the findings from this study to all AYA regardless of school enrollment. Third, self-reported data might be under- or overestimated compared with the actual situation. Fourth, the data collection of this study was performed 2 years prior to the writing of the manuscript. The presence and frequency of utilization of devices for internet access and social media likely changed during these years. Thus, the distribution of the most useful information sources among AYA currently differs from the time of data collection, and the internet and/or social media may have become more dominant than the situation stated in this study. It is important to continue to monitor and report AYA's perceptions and behaviors related to sexual and reproductive health because the dissemination of information and knowledge by reliable influencers should be ensured.

Conclusions

The factors associated with awareness of contraceptive methods, understanding of HIV/AIDS prevention and perceptions of HIV/AIDS risk were not consistent. To improve sexual and reproductive health, including awareness of contraceptive methods, understanding of HIV/AIDS prevention and perceptions of HIV/AIDS risk among AYA, sexual and reproductive health educational programs should be integrated and holistically provided under supportive conditions.

Declarations

Ethical approval and consent to participate

This study was approved by the Ethics Committees of Nagasaki University in Japan (approval number: 16012877) and Muhimbili University of Health and Allied Sciences in Tanzania. Three selected secondary schools approved the research proposal and agreed to allow the study to be conducted at the schools. Confidentiality was guaranteed by ensuring the participants' anonymity. Participation was voluntary, and withdrawal from the study was an option for respondents at any time.

Consent for publication

The study participants completed the questionnaire and submitted the completed questionnaire in the designated place after receiving verbal and written ethical explanations of the study's purposes, methods, anonymous process of data collection and analysis, confidentiality, and publication. This research article does not include any individual participant data, such as images, videos, or voice recordings.

Availability of data and materials

The datasets generated and analyzed during the present study are not publicly available due to the ethically sensitive nature of the research, but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

MN conceived the study and its design, collected data, performed the data analysis, and drafted the manuscript. SL, JT and MO reviewed the design, participated in data collection, and supervised the data analysis and manuscript preparation. All authors contributed equally to the research and writing of the manuscript and read and approved the final manuscript.

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List Of Abbreviations

HIV: Human Immunodeficiency Virus; AIDS: Acquired Immunodeficiency Syndrome; AYA: Adolescents and young adults; SD: standard deviation; ANOVA: analysis of variance

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Tables

Table 1. Sociodemographic characteristics of study participants (N=204)

	n	%
	(Mean ± SD)	
Gender		
Male	64	31.4
Female	140	68.6
Age		
≤ 17 years old	30	14.7
18 years old	72	35.3
19 years old	81	39.7
≥ 20 years old	21	10.3
Religion		
Catholic/Christian	141	69.1
Muslim	59	28.1
Other/don't know/no response	4	2.0
Major		
Sciences	94	46.1
Art or other (commercial, etc.)	108	52.9
No response	2	1.0
Mother's educational status		
≤ Primary school completed	54	26.4
Secondary school completed	60	29.4
College or university	65	31.9
Other/don't know/no response	25	12.3
Current living conditions		
Dormitory/boarding school	79	38.7
Out of dormitory (living with family, relatives, etc.)	121	59.3
Other/no response	4	2.0
Currently have a partner		
No	91	44.6
Yes	97	47.5
No response	16	7.8
Experience with sexual intercourse		
No	74	36.3
Yes	110	53.9
No response	20	9.8

Table 2. Frequency of awareness of contraceptive methods (N=196)

	Male		Female		P-value
	(n=59)		(n=137)		
	n	%	n	%	
Female sterilization	33	55.9	84	61.3	0.481
Male sterilization	36	61.0	72	52.6	0.275
Pill	37	62.7	85	62.0	0.929
IUD	15	25.4	35	25.5	0.985
Injectables	23	39.0	73	53.3	0.066
Implants	27	45.8	65	47.4	0.829
Male condom	52	88.1	105	76.6	0.064
Female condom	38	64.4	93	67.9	0.635
Rhythm method	11	18.6	30	21.9	0.607
Withdrawal	36	61.0	85	62.0	0.892
Emergency contraception	8	13.6	31	22.6	0.145

A chi-square test was performed.

Other/don't know/no response were excluded from calculations.

Table 3. Frequency of access to information sources regarding sexual and reproductive health, such as contraceptive methods, sexually transmitted infection and HIV/AIDS

	Information sources		Most useful information source	
	(n=201)		(n=162)*	
	n	%	n	%
Radio	121	60.2	15	9.0
Television	145	72.1	33	19.8
Newspaper or magazine	99	49.3	4	2.4
Internet website	100	49.8	51	30.5
Friends	110	54.7	8	4.8
Health facility/Pharmacy	51	25.4	3	1.8
Health personnel	54	26.9	7	4.2
Teacher	139	69.2	28	16.8
Family	89	44.3	18	10.8

*: Respondents who answered no information source and two or more information sources were excluded from the analysis.

Table 4. Type of information obtained by information sources (N=201)

	Male		Female		P-value
	(n=63)		(n=138)		
	n	%	n	%	
Contraceptive method	25	39.7	59	42.8	0.682
Pregnancy	17	27.0	60	43.5	0.026
STI and HIV/AIDS	47	74.6	108	78.3	0.567
Sexual relationships	39	61.9	78	56.5	0.473

A chi-square test was performed.

Table 5. Awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk by sociodemographic characteristics among high school students in Tanzania

	Contraceptive methods			HIV/AIDS prevention			Perception of HIV/AIDS risk (range: 1-5)		
	(range: 0-11)			(range: 0-2)			(N=131)		
	(N=204)			(N=204)					
	mean	SD	P-value	mean	SD	P-value	mean	SD	P-value
All	5.3	3.5		1.4	0.7		2.5	1.8	
Gender									
Male	4.9	3.7	0.373	1.4	0.7	0.872	2.8	1.9	0.007
Female	5.4	3.5		1.4	0.7		2.2	1.7	
Age									
≤ 17 years old	5.2	4.0	0.492 ^a	1.3	0.7	0.734 ^a	3.1	1.9	0.003 ^a
18 years old	5.6	3.5		1.3	0.8		1.7	1.3	
19 years old	4.8	3.3		1.5	0.7		2.8	1.9	
≥ 20 years old	5.8	3.9		1.4	0.8		2.9	1.9	
Religion									
Catholic/Christian	5.1	3.6	0.450	1.4	0.7	0.732	2.5	1.8	0.662
Muslim	5.6	3.5		1.4	0.7		2.3	1.8	
Major									
Sciences	5.7	3.7	0.153	1.2	0.8	0.010	2.42	1.8	0.713
Art or other (commercial, etc.)	4.9	3.3		1.5	0.7		2.54	1.8	
Mother's educational status									
≤ Primary school completed	4.0	3.2	0.007 ^a	1.3	0.8	0.389 ^a	1.9	1.5	0.113 ^a
Secondary school completed	5.7	3.4		1.5	0.6		2.7	1.9	
College or university	5.9	3.7		1.4	0.7		2.6	1.8	
Current living conditions									
Dormitory/boarding school	5.1	3.5	0.610	1.2	0.8	0.023	2.2	1.7	0.332
Out of dormitory	5.4	3.6		1.5	0.7		2.5	1.8	
Currently have a partner									
No	4.9	3.4	0.157	1.3	0.7	0.118	2.5	1.8	0.866
Yes	5.6	3.7		1.5	0.7		2.4	1.8	
Experience with sexual intercourse									
No	5.7	3.7	0.321	1.5	0.7	0.041	2.7	1.8	0.143
Yes	5.2	3.6		1.3	0.7		2.2	1.8	

A t-test or ANOVA was performed.

Other/don't know/no response were excluded from calculations.

Table 6. Correlation between awareness of contraceptive methods, understanding of HIV/AIDS prevention and perception of HIV/AIDS risk

	Awareness of contraceptive methods		Understanding of HIV/AIDS prevention		Perception of HIV/AIDS risk	
	ρ	<i>P</i> -value	ρ	<i>P</i> -value	ρ	<i>P</i> -value
Awareness of contraceptive methods (range: 0-11) (N=204)	1					
Understanding of HIV/AIDS prevention (range: 0-2) (N=204)	0.019	0.782	1			
Perception of HIV/AIDS risk (range: 0-5) (N=131)	-0.138	0.116	0.184	0.036	1	
Number of information sources (range: 0-9) (N=201)	0.654	<0.001	0.065	0.361	-0.168	0.057

Spearman's rank correlation coefficient (ρ) was calculated.

Table 7. Factors associated with awareness of contraceptive methods and understanding of HIV/AIDS prevention among high school students in Tanzania

	Contraceptive methods		HIV/AIDS prevention		Perception of HIV/AIDS risk	
	(range: 0-11) (N=144)		(range: 0-2) (N=144)		(range: 0-5) (N=93)	
	β	<i>P</i> -value	β	<i>P</i> -value	β	<i>P</i> -value
Gender (1: Male, 2: Female)	0.092	0.197	0.022	0.795	-0.081	0.486
Age	-0.055	0.426	-0.072	0.383	-0.055	0.615
Religion (1: Catholic/Christian, 2: Muslim)	0.123	0.078	-0.063	0.450	-0.013	0.903
Major (1: Sciences, 2: Art or other)	-0.074	0.292	0.218	0.010	-0.059	0.605
Mother's educational status	0.150	0.031	0.079	0.336	0.232	0.034
Current living conditions (1: Dormitory, 2: Out of dormitory)	0.016	0.820	0.295	0.001	0.114	0.288
Currently have a partner (0: No, 1: Yes)	-0.009	0.905	0.243	0.009	0.033	0.782
Experience with sexual intercourse (0: No, 1: Yes)	0.116	0.133	0.085	0.357	0.089	0.469
Number of information sources	0.584	<0.001	-0.026	0.757	-0.311	0.006
	<i>R</i> ²	0.431		0.185		0.138
	<i>F</i>	11.201		3.356		1.496
	<i>P</i> -value	<0.001		0.001		0.163

Linear regression analysis was performed.

Other/don't know/no response were excluded from calculations.