

# Effects of Curriculum-Based Sexual and Reproductive health intervention on the comprehensive knowledge and attitude to condom use among first-year students in Arba Minch University: a quasi-experimental study

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## Research note

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# Abstract

Objective: To assess the effect of curriculum-based sexual and reproductive health intervention on the comprehensive knowledge and attitude to condom use among first-year students at Arba Minch University. Results: A total of 832 students participated at a baseline, and 820 students participated at posttest. This study found that there was a significant effect on changing students' knowledge and attitude towards a condom. In the intervention group, the students' average change of comprehensive condom knowledge score was 0.229 higher than the average score of student' in the control group (ATE=0.229, 95% CI, 0.132 to 0.328;  $p < 0.001$ ). The average change of attitude toward condom score of students' in the intervention group was 1.834 higher than the average change score of students' in control group (ATE=1.834, 95% CI, 1.195 to 2.772;  $p < 0.001$ ). This study provides further evidence on the effect of the curriculum-based comprehensive sexual and reproductive health education effective in terms of knowledge and attitude towards a condom. Therefore, this education intervention should be strengthening the implementation of the control and prevent youths from HIV/AIDS and unintended pregnancy.

## Introduction

According to the world health organization (WHO) Youth is an important population group with great potential for physical, mental, and psychological development [1]. Youths are the largest population there were 1.80 billion people between the ages of 10 and 24 years, of the 70% are concentrated in developing countries[2]. In Ethiopia from the total population, 20.04% were between 15-24 years [2,3]. Most of them are joining a higher institution for an academic program [4,5]. Higher education institutions in Ethiopia host young people aged between 19 -24 years [4,6].

According to reports shows that worldwide youths were at high risk of HIV infection, accounting for 20% of new HIV infections[7]. Seventy-nine percent of these infections occur in sub-Saharan Africa (SSA)[7]. Also, each year 7.4 million girls experienced unintended pregnancies and 3 million girls experienced unsafe abortions[8]. These problems put young people at risk for morbidity, mortality and limiting their educational and employment opportunities [8,9].

Evidence shows that higher education institutions are the best place to deal with sexual reproductive health problem including HIV/AIDS and unintended pregnancy [10]. Ethiopia started sexual and reproductive health prevention information and services accessible to higher learning institutions Since 2008[11]. Even though comprehensive sexual health education intervention is implemented in Ethiopia as one of the sexual and reproductive health-related problems prevention and control strategies among higher institution youth in Ethiopia including the study area. However, the effect of this education was not assessed previously in Ethiopia. Therefore, this study aims to assess the effect of an education intervention on knowledge and attitude towards a condom among first-year students of Arba Minch University in 2017/18.

# Methods

## Study design and setting

A quasi-experimental study with pre-posttest in which students were divided into a control and intervention arm was conducted among first-year students of Arba Minch University.

## Population

All first-year students of Arba Minch University in regular programs were the source population whereas all first-year students in selected departments who attend regular programs and full fill inclusion criteria in both intervention and control groups were study population

## Inclusion and Exclusion Criterion (Eligibility Criteria)

The study included all first-year students whose age between 15–24 years, but those students who had previous exposure for compressive sexual and reproductive education and those who have unable to respond due to severe illness were excluded from the study.

## Sample size sampling technique

The required sample size for the number of students needed for this study was calculated by Open Statcalc based on the following assumptions: Based on the study done in Lusaka, Zambia, the proportion of students who used condom consistently and correctly with casual partner last time among control group was 59.1% and among intervention group was 71.4%<sup>[12]</sup>. At a 95% confidence interval for a two-sided test, 80% power with a minimum detectable alternative of  $\pm 5\%$ . Accordingly, the calculated sample size was 504 participants. Assuming a study refusal rate of 10% and a design effect of 1.5, a total minimum sample size needed for this study was  $504 \times 0.1 + 504 = 554 \times 1.5 = 832$  individuals. The total number of the sampled student was 832 (416 in the intervention group and 416 in the control group). For selecting the study participants, a multi-stage sampling method was done. Then eight departments were randomly selected from Arba Minch campus for intervention group and eight departments from Sawla campus were randomly selected for the control group. For each selected department proportional to size allocation was applied to identify the total number of students to be studied. Then after preparing the sampling frame based on the data from the registrar of the campuses, the study participants were selected using simple random sampling techniques using a computer-generated random table.

## Measurement

Knowledge towards condoms was measured using four items developed after reviewing previously done literature. The scale is comprised of the following question, having heard about the male and female condom, condoms are an effective method to prevent unwanted pregnancy, HIV/AIDS and STD. The correct answers were coded "1" and wrong answers "0"<sup>[13]</sup>.

**Attitude towards condoms was measured using** thirty Likert scale items developed after reviewing previously done literature. Respondents were presented with the following statements. Response categories included: 1 = agree, 2 = not sure and 3 = disagree.

**Intention to use a condom** was measured based on the study subjects responses to the question asked on regardless of their past sexual experience the students were assessed for their intention to use a condom in their next sexual encounter, using the following item: "I intend to use a condom at the next sexual intercourse." Responses were arranged from strongly agree to strongly disagree on a 5-point scale. This variable will be treated as continuous and each variable coded as "1" or Have great intention to use condoms If the study subject responded as he/she intend to use a condom at the next sexual intercourse and "0" or student don't have an intention to use condoms[3,14].

### **Data Collection Procedure**

Data were collected using a self-administered questionnaire. The questionnaire was initially adapted from the WHO knowledge, attitudes, beliefs, and practices survey instrument and further modified based on available literature [15-18]. At the pre-intervention stage, the baseline information for respondents was obtained from two groups (intervention and control group) one week before starting an educational intervention. The unique confidential identification number was assigned to each student to allow for matching their responses across time points. This was followed by intervention stage in which a series of sixteen-week education sessions for students in the intervention group which was designed to equip students with knowledge, skills, and attitudes needed to prevent from SRH problems and bring positive behavioral changes on sexual and reproductive issues. The education was delivered using brainstorming, lectures, case study, discussion and demonstrations methods. Immediately, after the last education session before the final exam, post-intervention stage, the same questionnaire that used in the pre-intervention stage was administered to the same students who were selected at the pre-intervention stage in both the intervention and the control groups.

### **Data Quality Control**

To data quality control training was given for data collectors and data clerk personnel. Intensive supervision was done by investigators during data collection. A pre-test was conducted at Arba Minch Health Science College that was equivalent to 5% of the study participants to check the accuracy and consistency of the data collection tools. All the data were cleaned double entered and cross-checked for their completeness and linkage to the unique identification number before analysis. The database was checked for incorrect or out of range data entry.

### **Data Analysis**

The completeness and consistency of the data were checked, coded and double entered into Epi-data 3.1 and exported to STATA version 14.0 statistical software for further analysis. Descriptive statistics was performed. Person chi-square test was used to compare categorical outcome variables before and after

intervention as well as between the intervention and control group. Furthermore, to compare continuous outcome variables before and after the intervention was tested using paired t-tests while differences between the control group and the intervention groups were tested using the independent t-test. To see the effect of intervention we used an Inverse Probability Weighted (IPW) analyses.

## Results

### Socio-demographic characteristics of the study participants

A total of 416 questionnaires were administered to each study group and control group at the pre-intervention stage of the study. Among those 401 and 404 questionnaires were filled, giving the response rate of 96.75%. At post-intervention stage 411 and 409 questionnaires were administered to intervention and control group respectively. Among those 396 and 397 questionnaires were filled at this stage giving the response rate of 96.71%. Furthermore, the study and control group were properly matched such that there was no statistically significant difference in their socio-demographic characteristics of respondents. (Table 1).

Table 1: Socio-demographic characteristics of the study participants in Arba Minch University, Ethiopia, 2018/19

Study group	Variables	Subcategories	Pre-Intervention N (%)	Post-Intervention N (%)	P-value
<b>(Intervention Group)</b>	Sex	Male	297(74.1)	294(74.2)	$\chi^2=0.206$ $P=0.694$
		Female	104(25.9)	102(25.8)	
	Age in year	Mean $\pm$ SD	19.55 $\pm$ 1.94	19.60 $\pm$ 1.14	
	Religion	Orthodox	259(64.6)	256(64.6)	$\chi^2=7.39$ $P=0.807$
		Catholic	2(0.5)	2(0.5)	
		Protestant	97(24.2)	95(24.0)	
		Muslim	39(9.7)	38(9.6)	
		Others	4(1.0)	5(1.3)	
	Type of school attended	Governmental	348(86.8)	347(87.6)	$\chi^2=42$ $P=0.654$
		Private	53(13.2)	49(12.4)	
	Participating in religion education	Yes	353(88)	367(92.3)	$\chi^2=0.069$ $P=1.000$
		No	48(12)	29(7.3)	
	Ever discussed Sex-related matters	Yes	170(42.4)	236(59.6)	$\chi^2=0.796$ $P=0.408$
No		231(57.8)	160(40.4)		
<b>Control Group</b>	Sex	Male	250(61.9)	245(61.7)	$\chi^2=0.58$ $P=0.595$
		Female	154(38.1)	152(38.3)	
	Age in year	Mean $\pm$ SD	19.67 $\pm$ 1.26	19.69 $\pm$ 1.17	
	Religion	Orthodox	278(68.8)	275(69.3)	$\chi^2=9.49$ $P=0.578$
		Catholic	8(2)	6(1.5)	
		Protestant	62(15.3)	61(15.4)	
		Muslim	54(13.4)	53(13.4)	
		Others	2(0.5)	2(0.5)	
	Type of school attended	Governmental	351(86.9)	349(87.9)	$\chi^2=1.19$ $P=0.282$
		Private	53(13.1)	48(12.1)	
	Participating in religion education	Yes	348(86.1)	307(77.3)	$\chi^2=1.44$ $P=0.235$
		No	56(13.9)	90(22.7)	
	Ever discussed Sex-related matters	Yes	168(41.6)	176(44.3)	$\chi^2=0.457$ $P=0.539$
No		236(58.4)	221(55.7)		

### Comparison of pre-test and post-test scores in both the intervention and control groups

From Paired t-test analysis, it was found out that there were significant differences in pre-test and post-test mean scores of comprehensive knowledge on condoms of the respondents in the intervention group with ( $p=0.001$ ). While among the respondents in the control group there are no significant differences in the mean improvement of the scores of Comprehensive knowledge on condoms ( $p=0.967$ ). Similarly, finding from Paired t-test analysis shows that, there were significant differences in the pre-test and post-test scores of attitude toward condoms ( $p=0.006$ ) of the respondents in the intervention group compared to the control group. Also, when comparing the baseline and end-line findings of both the intervention and control groups using Chi-square test. The proportions of study participants in the intervention group

148(36.9%) have the intention to use a condom during pre-intervention and 162(40.9%) during post-intervention periods (P-value =0.001).

### Comparison between of intervention and control groups after intervention

The finding of this study reveals that there is significant difference between intervention and control group after intervention using independent t-test shows that the mean scores between the two groups related to comprehensive knowledge of condom showed that the intervention group had higher scores than the control group with statistically significant differences (mean diff. = 0.221, 95%CI = 0.12 to 0.32: p=0.001). Also there is statistically significant differences in students' attitude to condoms (mean diff. = 2.01, 95%CI =1.06 to 2.96: p=0.001).

### Effect of comprehensive sexual and reproductive health education on knowledge and attitude to condom

Inverse probability weighting analysis was conducted to see the effect of the comprehensive sexual and reproductive health education on students' knowledge and attitude towards condom. All outcome variables were weighted by the baseline characteristics of study participants (sex, age, residence, religion, attendance of religious education and type of school they attended) to reduce the effect of selection bias.

In the intervention group, the student's average change of comprehensive condom knowledge score was 0.229 higher than the average score of the student's in the control group (ATE=0.229, 95% CI, 0.132 to 0.328; p < 0.001). The average change of attitude toward condom score of the student's in the intervention group was 1.834 higher than the average change score of student's in control group (ATE=1.834, 95% CI, 1.195 to 2.772; p < 0.001). (Table 2).

Table 2: The effect of comprehensive sexual and reproductive health education on Sexual behavior among first-year Arba Minch University students, Arba Minch, Ethiopia, 2018/19

Variables	Regression coefficient	95% CI	p-value
Comprehensive knowledge about condoms	0.229	(0.132,0.328)	< 0.001*
Attitude toward condoms	1.834	(1.195,2.772)	< 0.001*
Intention to use condoms	0.108	(0.042,0.175)	0.001*

\* P < 0.05 sig. (2-sided).

## Discussion

Results from the current study found that there is a significant difference between intervention and control group after intervention on student's comprehensive knowledge and attitude towards condom. This finding was in line with study conducted in Los Angeles and Northern Ghana [19,20]. This study also supported the 2030 Agenda specific all learners acquire knowledge and skills needed to promote sustainable development[21].

With regard to intention to use condom, the finding of this study that there were significant differences in the changing students' intention to condom use between the intervention and control groups after intervention. This finding was supported study conducted in Tanzania, Los Angeles, Zambian and USA [12,19,22,23]. This might inducted that availing condom around school compound may reduce students from practicing risky sexual behavior that may help the Fight against HIV and to Ending the AIDS Epidemic by 2030[21]

Furthermore, the finding of this study shows that there was no significant difference between intervention and control group in the consistent and correct use of condom after the intervention. This finding was supported by study conduct in Zambian secondary schools which reveal that there was no change in condom use practice after the intervention[24]. But inconsistent with other studies[18,25]. Moreover, previous study suggested that adequate condom related knowledge was not a sufficient determinant to condom use [26]. Furthermore, having information did not have a direct influence on condom use, information indirectly contributed to condom use mediated by behavioral skills [26,27].

## Conclusions

In conclusion, this study found that the curriculum-based comprehensive sexual and reproductive health education improve the students' knowledge and had impact on their attitude and intentions towards condom use. However, the findings of this study did not show a significant effect on students' consistent and correct use of a condom because this may require time to practice. Therefore, strengthen the implementation of this intervention should be are necessary for the control and prevention of STI including HIV/AIDS and unintended pregnancy.

### Limitation of study:

This study may have some of limitation. First, the campuses were not randomly assigned to intervention and control groups. Although, we tried to match some confounding factors such as social–demographic characters, there may be some unknown factors influencing the effect of intervention, which might increase or decrease the real effect of intervention. Second, the intervention period 6 months this may not show long term impact of this program.

## Declarations

### Ethics approval and consent to participate

The letter of ethical approval was obtained from the institutional review board of College of Medicine and Health Sciences in Arba Minch University with reference number CMHS/11833/11. Written consents from all participants were obtained after being fully informed about the objectives and procedures of the study for in both groups. The confidentiality and privacy of participants were actively protected. All participants were assigned a unique identification number. Every effort was made to emphasize the voluntariness of

this study and decisions to stop or discontinue in the study was respected and did not affect the regular attendance of education in any way.

**Consent for publication:** Not applicable

**Availability of data and materials:** The data used to support the findings of this study are available from the corresponding author upon request.

**Competing interests:** The authors declare that there is no conflict of interest regarding the publication of this paper

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### **Authors' contributions**

NB, SH and MS conceived and designed the study. NB and SH coordinated the running of the study. NB, TS, SS, SA, EZ, ND and ZT conducted data collection. NB, SH, WG, WG and EZ were participated in data analysis. NB and SH drafted the manuscript. NB, SH, MS, SS, TS, EZ, WG, SA, WG, ND and ZT contributed to the interpretation of the analysis and critically revised the manuscript. All authors read and approved the final manuscript.

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## **References**

1. Yari F, Moghadam ZB, Parvizi S, Nayeri ND, Rezaei E, et al. (2016) An Evaluation of the Effectiveness of a Reproductive Health Education Program for Nonmedical Students in Iran: A Quasi-Experimental Pre-Test, Post-Test Research. Shiraz E-Medical Journal 17.
2. Federal Democratic Republic of Ethiopia Ministry of Health (2016). National adolescent and youth health strategy (2016-2020). Addis Ababa, Ethiopia.
3. Deyessa N, Tesfaye G. Intention to use condom among students in Agena preparatory school, Guraghe Zone, Ethiopia: with the application of health believe model. Archives of public health. 2013 Dec;71(1):23.
4. Yao F (2013) Making Sexual and Reproductive Health and HIV Prevention Information and Services Accessible to Higher Learning Institutions (UNFPA and UNICEF Joint Programme on a Rights-Based Approach to Adolescent and Youth Development) 2008-2013.
5. Prajapati R, Sharma B, Sharma D (First Quarter 2017) Significance Of Life Skills Education. Contemporary Issues in Education Research 10.

6. Melaku YA, Berhane Y, Kinsman J, Reda HL. Sexual and reproductive health communication and awareness of contraceptive methods among secondary school female students, northern Ethiopia: a cross-sectional study. *BMC Public Health*. 2014 Dec;14(1):252.
7. Helleve A, Flisher AJ, Onya H, Mukoma W, Klepp KI. South African teachers' reflections on the impact of culture on their teaching of sexuality and HIV/AIDS. *Culture, Health & Sexuality*. 2009 Feb 1;11(2):189-204.
8. Chandra-Mouli V, Svanemyr J, Amin A, Fogstad H, Say L, et al. (2015) Twenty Years After International Conference on Population and Development: Where Are We With Adolescent Sexual and Reproductive Health and Rights? *Journal of Adolescent Health* 56.
9. Gottschalka LB, Ortayli N (2014) Interventions to improve adolescents' contraceptive behaviors in low- and middle-income countries: a review of the evidence base. *Contraception* 90: 211-225.
10. Oljira L, Berhane Y, Worku A. Assessment of comprehensive HIV/AIDS knowledge level among in-school adolescents in eastern Ethiopia. *Journal of the International AIDS Society*. 2013 Jan;16(1):17349.
11. Yibeltal K, Yohannes E (June 2013) Planning, Monitoring and Evaluation Training Manual for Higher Education HIV/AIDS and SRH Interventions in Ethiopia Addis Ababa, Ethiopia.
12. Agha S, Van Rossem R. Impact of a school-based peer sexual health intervention on normative beliefs, risk perceptions, and sexual behavior of Zambian adolescents. *Journal of adolescent health*. 2004 May 1;34(5):441-52.
13. Nicolau AI, Ribeiro SG, Lessa PR, Monte AS, Bernardo EB, Pinheiro AK. Knowledge, attitude and practices regarding condom use among women prisoners: the prevention of STD/HIV in the prison setting. *Revista da Escola de Enfermagem da USP*. 2012 Jun;46(3):711-9.
14. Abera H, Tamiru F, Kibret GD. Intention toward condom use and its associated factors among students of Debre Work Senior Secondary and Preparatory School, East Gojjam Zone, Amhara Region, Ethiopia. *HIV/AIDS (Auckland, NZ)*. 2017;9:137.
15. de Castro F, Rojas-Martinez R, Villalobos-Hernandez A, Allen-Leigh B, Breverman-Bronstein A (2018) Sexual and reproductive health outcomes are positively associated with comprehensive sexual education exposure in Mexican high-school students. 13: e0193780.
16. Fentahun N, Mamo A. Risky sexual behaviors and associated factors among male and female students in Jimma Zone preparatory schools, South West Ethiopia: comparative study. *Ethiopian journal of health sciences*. 2014;24(1):59-68.
17. Mathews C, Eggers SM, Townsend L, Aaro LE, de Vries PJ, et al. (2016) Effects of PREPARE, a Multi-component, School-Based HIV and Intimate Partner Violence (IPV) Prevention Programme on Adolescent Sexual Risk Behaviour and IPV: Cluster Randomised Controlled Trial. *AIDS Behav* 20: 1821-1840.
18. Menna T, Ali A, Worku A. Effects of peer education intervention on HIV/AIDS related sexual behaviors of secondary school students in Addis Ababa, Ethiopia: a quasi-experimental study. *Reproductive health*. 2015 Dec;12(1):84.

19. Schuster MA, Bell RM, Berry SH, Kanouse DE. Impact of a high school condom availability program on sexual attitudes and behaviors. *Family planning perspectives*. 1998 Mar 1:67-88.
20. Van der Geugten J, van Meijel B, den Uyl MH, de Vries NK. Evaluation of a sexual and reproductive health education programme: Students' knowledge, attitude and behaviour in Bolgatanga municipality, northern Ghana. *African Journal of Reproductive Health*. 2015;19(3):126-36.
21. The Sustainable Development Goals , March 2017, available at:  
<https://www.refworld.org/docid/58b6e3364.html> [accessed 9 September 2019].
22. Mmbaga EJ, Kajula L, Aaro LE, Kilonzo M, Wubs AG, et al. (2017) Effect of the PREPARE intervention on sexual initiation and condom use among adolescents aged 12-14: a cluster randomised controlled trial in Dar es Salaam, Tanzania. *BMC Public Health* 17: 322.
23. Chen X, Stanton B, Gomez P, Lunn S, Deveaux L, et al. (2010) Effects on condom use of an HIV prevention programme 36 months postintervention: a cluster randomized controlled trial among Bahamian youth. *Int J STD AIDS* 21: 622-630.
24. Agha S, Rossm RV (2004) Impact of a School-based Peer Sexual Health Intervention on Normative Beliefs, Risk Perceptions, and Sexual Behavior of Zambian Adolescents. *Journal of adolescent health* 34: 441-445.
25. Reis M, Ramiro L, de Matos MG, Diniz JA. The effects of sex education in promoting sexual and reproductive health in Portuguese university students. *Procedia-Social and Behavioral Sciences*. 2011 Jan 1;29:477-85.
26. Jiang H, Chen X, Li J, Tan Z, Cheng W, et al. (2019) Predictors of condom use behavior among men who have sex with men in China using a modified information-motivation-behavioral skills (IMB) model. *BMC Public Health* 19: 261.
27. Cai Y, Ye X, Shi R, Xu G, Shen L, Ren J, Huang H. Predictors of consistent condom use based on the Information-Motivation-Behavior Skill (IMB) model among senior high school students in three coastal cities in China. *BMC infectious diseases*. 2013 Dec;13(1):262.