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Non-cognitive Skills for Safe Sexual Behavior: An Exploration of Baseline Abstinence Skills, Condom use Negotiation, Self-esteem, and Assertiveness Skills from a Controlled Problem-based Learning Intervention among Adolescents in Tanzania

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Abstract- *Background:* The proper forming and well-being of adolescents is crucial to the development of a country through its potential contribution to economic prosperity. Adolescents aged between 10 to 19 are in the crucial stage of formation of the right personality and character leading to social responsibility. Thus, these early years are important in shaping them for successful investment and intervention in their later years. This study presents baseline cross-section findings from the randomized controlled intervention that aimed at testing the effect of Problem-based Learning (PBL) on non-cognitive skills (abstinence skills, condom use negotiation, self-esteem, and assertiveness) for safe sexual behavior among adolescents in Tanzania mainland.

Methods: The study employed an analytical cross-section design that adopted a clustered quantitative research approach of 647 randomly selected respondents and was conducted between September and December 2019.

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Walter C. Millanzi [α], Kibusi, S.M. [σ] & Osaki, K.M. [ρ]

Abstract- Background: The proper forming and well-being of adolescents is crucial to the development of a country through its potential contribution to economic prosperity. Adolescents aged between 10 to 19 are in the crucial stage of formation of the right personality and character leading to social responsibility. Thus, these early years are important in shaping them for successful investment and intervention in their later years. This study presents baseline cross-section findings from the randomized controlled intervention that aimed at testing the effect of Problem-based Learning (PBL) on non-cognitive skills (abstinence skills, condom use negotiation, self-esteem, and assertiveness) for safe sexual behavior among adolescents in Tanzania mainland.

Methods: The study employed an analytical cross-section design that adopted a clustered quantitative research approach of 647 randomly selected respondents and was conducted between September and December 2019. All respondents were adolescents from selected secondary schools in four district councils within Tanzania mainland. The standardized Sexual-risk Behavior Beliefs and Self-esteem Scale (SRBBSES) questionnaire was used to measure non-cognitive skills among study respondents. Statistical Product for Service Solutions (SPSS) version 23 was used to analyze data and findings were presented in tables by frequencies, percentages, and adjusted odds ratio at 95% confidence interval with a significant level at 5%.

Results: The mean age of the study respondents was 15 years with a minimum of 12 and a maximum of 19 years. Majority of them (57.5%) were females. Findings revealed that 14.2% of the respondents had adequate non-cognitive skills for safe sexual behaviors. 8.8% of respondents demonstrated skills to abstain from sex, 20.4% intention to negotiate using a condom, 12.1%, and 22.1% demonstrated self-esteem and assertiveness skills for safe sexual behavior respectively. Males were found to be more times likely to have adequate non-cognitive skills compared to females (AOR = 1.740; p<0.05; 95%CI: 1.082, 2.797). Additionally, parental financial protection was a protective factor to non-cognitive skills (AOR = 1.865; p<0.05; 95% CI: 1.106, 3.146) among adolescents. In conclusion, most adolescents had low levels of non-cognitive skills for safe sexual behavior, a case that needs prompt interventions to empower them with such skills for their future formation and wellbeing.

Keywords: *adolescent, safe sex, sexual behavior, condom, assertiveness, self-esteem, non-cognitive skills, soft skills.*

I. Plain English Summary

The well-being of adolescents is crucial to the development of a country through its potential contribution to economic prosperity. However, Adolescents aged between 10 to 19 years old face problems ranging from their basic needs to economic needs. Unsafe sexual behaviors among adolescents remain substantial growing public health concerns around the globe. The Ministry of Health Community Development Gender Elderly and Children reported that 27% of adolescents in Tanzania for example, get underage pregnancies and an estimated 8,000 adolescent girls drop out of school every year. Moreover, the report noted that 57% and 48% of young women and men respectively, report having had sex by the age of 18 years. 35% of females and 33% of males aged between 10 to 14 years were reported to have HIV infection.

The current study believed that unsafe sexual behavior develops among adolescents aged between 10 to 19 years persists due to a lack of non-cognitive skills necessary for their early years of life. This study, therefore, aims at exploring baseline abstinence skills, condom use negotiation, self-esteem, and assertiveness skills for safe sexual behavior from a randomized controlled PBL intervention among 647 randomly selected school-going adolescents. As it has worked elsewhere, Problem-Based Learning intervention programs have improved later life outcomes when done in the early years of life because non-cognitive skills are malleable at that time. Findings will help to improve educators'/teachers'/parents' and adolescent's roles in

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sexual and reproductive health. Moreover, they will promote remedial strategies to improve adolescents' reproductive health in Tanzania.

II. Contribution to the Literature

- Education and health Professionals might be enlightened about the levels of non-cognitive skills and its associated factors for safe sexual behavior among school-going adolescents so that age-appropriate and pedagogical innovation sexual and reproductive health intervention can be developed and implemented
- Findings constitute a vital knowledge necessary for instructors on how to design and implement curricula to address the levels of non-cognitive skills of adolescents on safe sexual and reproductive health behavior
- Researchers will also use findings of this study as baseline data for further interventional studies or projects at a large scale

III. Background

The proper formation and the well-being of adolescents are crucial to the development of a country through its potential contribution to economic prosperity (1). The proper formation was defined in this study as a process of forming and shaping one's safe character for the betterment of future behavior and thus, healthy adulthood. Nearly one-third of global morbidity and two-thirds of mortality in adults are associated with conditions or behaviors that begin in adolescence (2). Thus, early years are important in shaping cognitive and non-cognitive skills for their successful investment and intervention in the later years. Cognitive skills focus on knowledge of human biology and development; non-cognitive skills are those associated with how to protect oneself from sexual emotions, desires, dilemmas, and associated social pressure. WHO (3) estimates that, of the 7.2 billion world population, 42% (over 3 billion) are younger than 25 years, 18% (1.2 billion) are adolescents aged 10 to 19 years. About 88% of adolescents live in developing countries whereby Sub-Saharan Africa (SSA) constitutes 18% of them. It is also projected that by 2010 to 2030 the adolescent population in Sub-Saharan Africa will increase to 1.3 billion (4).

Adolescents aged between 10 to 19 face problems ranging from their basic needs to economic needs (5). Their capabilities to regulate sexual impulses and emotions develop gradually in this stage. Emotions here include the desire for intimacy, friendship, and belonging, which at this age translate into temptations to sexual acts at an age when they have little understanding of their consequences. Indeed, suggested data from Schiller (6) neuroscience is that changes in affective processing during adolescence may critical to understanding unsafe behavior in this age period. Moreover, Christopher *et al.,*(7)unfolds that adolescents with poor self-regulation of sexual emotion and behavior in early ages are more sexual risk-taking and might have more sexual partners later in their lives. This study believed that although sex may be seen as emotional involvement, for some adolescents it may start as a commercial endeavor that may lead to emotional (or vice versa) and with health, educational and socioeconomic consequences. According to the report by UNAIDS (8), approximately 250,000 young people in school-age were newly HIV infected globally of which about 182,500 (73%) of them are residing in Sub-Saharan Africa. Moreover, it was reported that trends of new HIV infection have continued to decline from 3.4 million in 1996 to 1.8 million in 2017. However, its progress is slower than the requirement to reach the decline to 500, 000 new infections by 2020.

Exposure to early unsafe sexual behaviors has led to approximately 1 million adolescents aged between 15 to 19 years old, ending up with unplanned pregnancies and Sexually Transmitted Infections (STIs) and Human Immunodeficiency Virus (HIV) infection. These STIs/HIV infections accounted for 60% and 69% of global and SSA reported prevalence respectively.

UNICEF (9) reported that 11% of boys and 6% of girls claimed to have had sex before the age of 15 years globally. They reported early sexual debut, being involved in a sexual partnership with older men, and having unprotected sex. Moreover, risks associated with parental, teachers or peer sexual harassment, drug abuse, teenage pregnancies, childbearing, sexually transmitted infections (STIs)/ HIV/AIDS, and school dropouts have persisted(10).

In the face of early onset of unsafe sex among adolescents, 16 million (11%) girls aged 15 to 19 years give birth each year of which 95% occur in the low and middle-income countries where 10% of girls become mothers by the age of 16 years (11). In the African region, it has been reported from the systematic review and meta-analysis that the prevalence of adolescents' pregnancies reached 18.8% in all Africa whereas 19.3% in the Sub-Saharan African region. Additionally, the prevalence was observed to be high in East Africa (21.5%) and low in Northern Africa (9.2%), the trend, which was discussed to be attributed by inadequate parent-children communication on sexual matters, not attending to school, and lack of maternal education (12). It is well acknowledged that the rate of teenage pregnancies is declining to the hoped threshold across African countries whereas in which Rwanda (7.3%) and Ethiopia (12.4%) have the lowest rate than other African regions. The report revealed the highest percentages of adolescents' pregnancies in Uganda (23.8%) and Tanzania (22.8%) whereas out of 57% of young women and 48% of young men report having had sex by the age of 18 years (13).

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Unsafe sexual behaviors among adolescents remain substantial public health, as well as a growing concern in Tanzania. Tanzania Health Management Information System (THMIS) 2012-2017 reported an increase in the prevalence of new HIV and STIs infection from unsafe sex among adolescents (14). Different reports on sexual education in Tanzania (15–19) suggest that adolescents in Tanzania are not well empowered with the necessary soft skills for safe sexual behavior change.

The MoHCDGEC (20) reported that 27% of adolescents in Tanzania, get underage pregnancies. UNICEF (21)reported that an estimate of 8,000 (1,760 in primary schools and 6,240 in secondary schools) adolescent girls dropped out of school due to pregnancy. The rate of teenage pregnancies varied across Tanzanian regions in proportion to secondary school students' enrollment rate, access to knowledge, and life-skills education on sexual and reproductive health. Moreover, MoHCDGEC (22) noted that 57% and 48% of young women and men respectively, report having had sex by the age of 18 years while 35% of females and 33% males aged between 10 to 14 years old, were reported to have HIV infection.

This situation prevails despite many interventions being implemented in different parts of the country including policy and legislation reinforcement by the government, sexual education clubs, large scale reproductive and family planning campaigns, projects, including sexual health education training to teachers (22,23). New infections, unintended pregnancies, and its associated obstetric health outcomes are indicators that ongoing interventions are neither effective in empowering adolescents with non-cognitive skills for them to have informed decision over the sexual activities nor reaching most of the adolescents. Moreover, it has been observed from previous studies and reports that adolescents' levels of non-cognitive skills and behavioral change have changed relatively little.

Non-cognitive skills (soft skills) consist of a set of non-academic competencies, behaviors, attitudes and personal qualities, which enable people to effectively navigate their environment, work well with others, perform well and achieve their goals (Lippman *et al.* 2015). In the current study, non-cognitive skills include adolescents' self-esteem, intention to abstain or be faithful, pre-emptively recognizing forced sexual relationships, negotiation skills, and report and refusal skills of sexual activities. Adolescents who have adequate non-cognitive skills are expected to make informed decisions on sexual behaviors including among others, a protective factor to new STIs/HIV, unintended teenage pregnancies, forced early marriages, and or school dropouts. However, based on the sexual practices, STIs/HIV, teenage pregnancies, and school dropout statistics above, the situation seems to be different and thus needed a deeper investigation.

Watts *et al.,*(26) once unfolded that the early years are important in shaping these skills to lay the foundations for successful investment and interventions in the later years among adolescents aged between 10 to 19. During their early ages, adolescents' minds tend to be malleable to changes around them. They can easily be conditioned to actions and adopt them in their adult lives. Although the curricula seem to do well on students' knowledge and awareness of STIs/HIV, they do not adequately promote soft skills, and healthy behavior, and positive attitude that would allow students to develop healthy lifestyles, which could positively influence shaping safe sexual behavior among adolescents in Tanzania.

The trend has been noted due to the resurgence and an increase in reported new cases of STIs/HIV, sexual debuts, teenage pregnancies, early marriages, school dropouts, and related obstetric complications among adolescents aged between 10 to 19 years old(22,27). This has been witnessed among adolescent girls who experience high levels of youthful fertility sentiments at their young age and consequently may become child parents who depend on their parents.

Zakayo and Lwelamira (28) did a cross-sectional survey to determine sexual behaviors among adolescents in Community Secondary Schools in rural areas of central Tanzania. Their findings revealed that despite adolescents' awareness of sexual and reproductive health, their levels of sexual activity and unsafe sexual behaviors among them were unacceptably high. 51.2% of adolescents initiated sexual intercourse below the age of 15 years, 22% had multiple partners, and 36% did not use a condom in their sexual encounter. With these findings in mind, there seems that adolescents still lack non-cognitive skills to decide for safe sex.

Adolescents, especially young girls who enter first classes in secondary schools face the greatest risk of unreasoned sexual activity, which exposes them to unplanned pregnancies, STIs/HIV, associated obstetric complications, and school dropouts. Mbelwa and Isangula (29) assessed teenage pregnancy in Tanzania (Children having children) and they observed that there are high teenage pregnancies and the use of contraceptive methods is low. They noted that the sexual and reproductive health and its associated services are currently not promising enough to address unsafe sexual behavior among adolescents.

Based on the available and reviewed the information in this study, there seemed to be some unanswered questions about the role of non-cognitive skills (condom use negotiation, self-esteem and assertiveness skills) and its associated factors on safe sexual behavior among adolescents in Tanzania mainland. Among the un-answered questions, include, for example: what do young people think is 'safe'

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behavior? How ready are they to practice 'safe' behavior? What forces prevent them from acting safely despite the knowledge they have? and or which innovative age-appropriate teaching and learning pedagogy will promote their non-cognitive skills to make an informed decision over the sexual activities? If the current state continues, new STIs including HIV, unintended pregnancies, and their associated obstetric complications, and school dropouts will continue to prevail.

Given this situation, there seemed a need to investigate non-cognitive skills for safe sexual behavior by exploring baseline abstinence skills, condom uses negotiation, self-esteem, and assertiveness skills from the randomized controlled PBL intervention among adolescents aged between 10 to 19. Thus, the study was guided by four objectives namely to assess: i) adolescents' intention to abstain from sexual intercourse, ii) ability to negotiate condom use, iii) their levels of self-esteem on safe sexual behavior and iv) their assertiveness skills for safe sexual behavior in Tanzania mainland.

IV. Methods

a) Study Design and Approach

This study employed a baseline analytical cross-section design from the randomized controlled PBL intervention. It adopted a clustered quantitative research approach of 647 randomly selected respondents and was conducted between September and December 2019. It intended to assess levels of non-cognitive skills by exploring four aspects including abstinence skills, condom use negotiation, self-esteem, and assertiveness skills for safe sexual behavior among adolescents in Tanzania mainland.

b) Study Location

This study was conducted in Tanzania mainland. The country is located in Eastern Africa between Longitude 29^0 and 41^0 (East) and Latitude 1^0 and 12^0 (South). It has a total area of 883.6 ("000"km^2).Its frontiers include Kenya and Uganda (North), Rwanda, Burundi and Democratic Republic of Congo (West), Zambia and Malawi (South West), Mozambique (South), and the Indian Ocean (East) (30). The population of Tanzania has increased from 12.3 million in 1967 to 55,890,747 million in 2019 of which 27,356,189 are males and 28,534,558 females with a total fertility rate of 5.0 (30).

The country offers public and social services inter alia, health, and education. It has 4,885 secondary schools (3637 public and 1248 private). The country has 2, 023, 205 secondary school students of which 982, 220 were males and 1, 040, 985 females. The enrollment (Form One to Form Six)was estimated to be 2, 148, 466 (1, 056, 498 males and 1, 091, 968 females) (32). Through the National School Health Programme, many adolescents are currently provided with several health-related services that provide reproductive and sexual health information including counseling support in school (MoHCDGEC, 2018). The number of health facilities has increased from 6,321 in 2010 to 7,519 in 2015 (30).

The country has seven administrative zones including Central Zone: (Dodoma, Singida and Tabora), Coastal Zone: (Dar er Salaam, Lindi, Morogoro, Mtwara, and Pwani), Lake Zone: (Geita, Kagera, Mara, Mwanza, Shinyanga, and Simiyu). Other include Northern Zone: (Arusha, Kilimanjaro, Manyara, and Tanga), Southern Highlands Zone: (Iringa, Mbeya, Njombe, Rukwa, Ruvuma, and Songwe), Western Zone: (Katavi, and Kigoma), and Zanzibar: (Mjini Magharibi, Pemba North, Pemba South, Unguja North, and Unguja South). For this study, two (2) out of the seven (7) administrative zones were randomly selected. These included the Central (Dodoma region) and Coastal zone (Lindi region).

c) Dodoma region

Dodoma region lies in the heart of Tanzania in the Eastern-Central party of the country. According to the 2012 national census, the region had a population of 2, 083, 588 of which 471, 958 people had ages between 10 to 19 years old. The National Bureau Statistics (NBS) projected the region's population of 2, 312, 141 by 2017 of whom 1, 126, 309 are males and 1, 185, 833 being females (14). The region has 2 Universities, 220 secondary schools, and 757 primary schools with a total of 83, 549 secondary school students of which 37, 890 were males and 45, 659 females. Administratively, the region is divided into seven (7) districts including; Dodoma City Council, Kondoa, Chemba, Bahi, Chamwino, Mpwapwa, and Kongwa (33). The region has eight Local Government Authorities, 29 Divisions, 209 wards, 6607 Villages, 181 Streets, and 2,184 Hamlets. Kondoa District comprises of Town Council and Kondoa District Council while the rest of Districts have one Council each (33). Two out of seven districts in the Dodoma regionwere randomly selected namely Dodoma City Council and Kondoa District Council). Schools were selected three from each district to make six schools because this was a school-based study.

d) Lindi region

The region is located in the coastal zone at the far end of Lindi Bay, on the Indian Ocean in Southeastern Tanzania. According to the 2012 National census, it had a population of 864, 652 of which 414, 507 were males and 450, 145 being females whereby 180, 532 were aged between 10 to 19 years old. The National Bureau Statistics (NBS) projected the region's population of 983, 700 by 2017 (14). The region has a total of 123 secondary schools and 503 primary schools with 36, 427 secondary school students by 2019 of which 17, 903 were males and 18, 524 being females

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(34). Administratively, it is divided into six districts including. They include Lindi Municipal Council, Kilwa, Lindi Rural, Liwale, Nachingwea, and Ruangwa. Two out of seven districts in the Lindi region were randomly selected namely Lindi Municipal Council and Kilwa District Council. Schools were selected because this was a school-based study.

e) Target Population

The target population was school-going adolescents aged between 10 to 19 years old in Tanzania. Contrary to Demographic Health Surveys (DHS) and other studies, data are often describing adolescents aged between 15 to 19 years or included in young adults (15 to 24 years) than younger adolescents (10 to 14 years). This study intended to investigate the full range of adolescents from age between 10 to 19years old among secondary schools found within Tanzania mainland.

f) Study Population

The study populationwas all school-going adolescents aged 10 to 19 years old in Tanzania. This group included most adolescents who were newly sexually matured and active and were therefore prone to engage in unsafe sexual behavior. There is no other period in life when individuals are more likely to exhibit unsafe sexual behaviors than in their adolescent age (10 to 19 years) due to bursts of biological and social changes associated with puberty. Besides, the capabilities of adolescents to regulate sexual impulses and emotions develop gradually in this stage. The majority of them are found in upper primary and secondary schools. Thus, there could be a wide capacity to reach a large number of students and schools were the crucial mediator for preventive health interventions.

g) Sampling Techniques

A simple random sampling method was used to select two out of seven (7) zones in Tanzania including central and coastal zones. Multistage random sampling method was used to select regions (two regions were selected, one from each zone), and districts (four districts were selected; two from each region). A simple random sampling technique by lottery method was used to select secondary schools (12 secondary schools were selected; three from each district). A stratified random sampling technique was used to select classes and a random numbers table sampling method was used to get a minimum sample of the study respondents.

To perform a random numbers table sampling method for achieving a minimum sample size of this study, all participants involved in the study were listed in a piece of paper and numbered them from one to the proportioned number in such a particular school. The researcher then, closed eyes, randomly pointed to a spot on the chart of numbers, move sideways, up or down until the number, which was in the list was found. All participants whose mentioned number was in the list, the number was kept, otherwise, the number was discarded. This process continued until a minimum sample of usable numbers with no repetitions was reached.

h) Control of Strenuous Variables during the Sampling Procedure

The control of confounding effect was done to decrease the errors, which would decrease accuracy in study findings. In this study, a random selection of the study settings and participants was done. Sampling sites were far apart from each other from causing information contamination and both research assistants and the study participants were blinded on the research intent.

i) Sample Size Determination

The study involved a minimum sample size of 647 respondents. The 95% Confidence Interval (CI) was set to determine the effect size of demonstrating statistically significant values of data. The probability that any discrepancy between a sample statistic and a specified population parameter was due sampling and process error or chance was set at a 5% level of significance (expected precision for the difference between means was set at – 2.799 to +2.799). The sample was proportionally distributed to the selected secondary schools in Tanzania mainland, classes, and year of study based on the number of students by using the proportionate formula to get strata ($ni = Pi \times n/P$).

Participation in this study was voluntary. It consisted of all school-going adolescents between 10 to 19 years old, who were admitted and registered and stayed in/out the campus in the respective registered secondary schools as per the semester schedule. Only students who had regular class attendance and who gave the required informed consent participated in this study. However, school-going adolescents who were absent dropped out of school, street children/adolescents, and the sick ones were excluded.

j) Data Collection Process

Quantitative methods, using researcher guided self-administered structured questions was used to collect data. The questionnaires used structured close-ended and Likert type response questions. Sampled and consented study respondents were seated on single and sparse chairs in a room separate from their teachers and parents or relatives for assuring their privacy, confidentiality and make them feel free and comfortable to express themselves. Each study respondent was assigned a code number for easy identification and to ensure anonymity. They were then provided with brief instructions about the process of filling the questionnaires.

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The researcher and assistants addressed any queries from them accordingly. Copies of questionnaires were thereafter distributed among them of which they all answered the same questions about soft skills for safe sex after. The process of filling the questionnaires took approximately 15 to 30 minutes for them to finish and submit it to the researcher or assistant researchers. Filled questionnaires were placed in a sealed envelope labeled with study respondents' code to ensure their identity. Two research assistants per classroom were assigned to facilitate the data collection process.

k) Data Collection Methods and Tools

i. *Questionnaires*

The questionnaires used in this study were benchmarked from standardized Sexual-risk Behavior Beliefs and Self-esteem Scale (SRBBSES)(35). This tool was benchmarked as recommended by earlier researchers including Tight, Mok, and Huisman (36) and Unis *et al.,*(37) that used to assess sexual behavior, beliefs, and self-esteem on safe sex. Other benchmarked tools included; Illustrative Questionnaires for interview-surveys with young people from WHO, which was developed by Cleland (38), HIV/AIDS questionnaires (39–41) and TDHS (42). Some language corrections and rearrangements on the order of questions were made to keep the logical flow from simple to complex to address the desired objectives under study.

The questionnaires consisted of 137 items divided into four parts. These includedpart 'A', which assessedDemographic information of the study respondents (112 items). The part was divided into eleven (11) sub-parts such as; i) Individual characteristics (11 items); ii) Parent characteristics (8 items); iii) Family structure (10 items); iv) Child-parent communication on sexual matters (7 items). Other parts were v) Environmental characteristics (10 items); vi) Financial and capital protection (9 items); vii) Neighbourhood characteristics (6 items); viii) Social cohesion (14 items); ix) Sexual ideology, identity and myth (17 items); x) Exposure to media (10 items) and xi) Exposure to drug abuse (10 items).The last part 'B' had questions about non-cognitive (Soft) skills on sexual behavior (25 items).High scores (>12.5) was considered adequate soft skills for safe sexual behaviors, otherwise not.

ii. *Validity*

The tool used in this study was benchmarked from a reliable source that was publicly accessible (38,40,43,44). The tool was adapted from English and then translated into the Swahili language. It was then shared with the supervisors, senior researchers, statisticians, and subject specialists for their technical and professional assistance on content validity, age appropriateness, and contextual appropriateness. Their comments on age, culture, context, and language aspects were addressed accordingly. Assistant researchers were briefly instructed about the research tools. However, they were blinded to the study intention and process.

iii. *Reliability*

The tools used in this study were pre-tested for reliability before use as prescribed by Polit & Chaboyer (42). Pre-testing the tools was done in secondary schools within a region that was different from those, which this study was conducted. The pre-test involved a total of 20 participants and supportive team members including research assistants, curriculum/program developing specialist, sexual and reproductive health specialist, and secondary school teacher who had at least one year experience in teaching.

The reliability of the overall score was assessed after the completion of the pre-test by calculating a Cronbach's coefficient alpha for internal consistency reliability. The 25 items were subjected to the scale analysis for reliability tests for non-cognitive skills assessment for safe sex. Findings indicated the Cronbach Alpha of 0.847 (n = 73; M = 65.60; variance = 278.147 and SD = 16.678). No item was removed from the scale, as none of them had zero variances. Based on Tavakol *et al.,*(45) and Hajjar *et al.,*(46) interpretations and recommendations on making sense of Cronbach alpha, findings of the pilot study assumed that the tool was approximately reliable for an actual field data collection.

iv. *Data analysis*

The Statistical Product for Service Solutions (SPSS), computer software program version 23was used for both descriptive and inferential statistical data analysis. The significance level was at set ≤0.05 of the 95% Confidence Interval (CI) otherwise, the variables were considered to be not related, correlated, or associated with each other. Descriptive data analysis was performed to analyze the demographic characteristics of the study respondents, and findings were presented in tables by frequencies (n) and percentages (%). Chi-square and Cross-tabulation tests were performed to analyze all categorical data about the overall levels of soft skills for safe sexual behaviors among the study respondents. Inferential statistical analysis was used to determine the association between variables (independent and dependent) whereas logistic regression was performed. Findings of inferential statistics were presented in tables by odds ratio (OR), adjusted odds ratio (AOR), probability values (p-value), 95% confidence intervals (CI).

V. Results

a) Participants' Characteristics

The mean age of the study participants was 15 years with 12 and 19 years being the minimum and the

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maximum age in years an ill sampled study groups respectively. The most dominating age group (71.2%) ranged between 13 to 16 years of age whereas, 72.5% (n = 103) of the participants were found in Pure PBL, 66.5% (n = 125) in Hybrid PBL and 73.5% (n = 233) in a Lecture group. Female participants were many (57.5%) in all groups compared to males whereby 58.5% (n = 83) female participants were found in a Pure PBL while 58.5% (n = 110) and 56.5% (n = 179) were found in Hybrid and Lecture groups respectively (Table 1).

Additionally, the orphanage and disability status of the study participants were assessed. Findings showed that 10.2% of the study participants (8.5% (n = 12) in a Pure PBL, 20.6% (n = 20) in the Hybrid PBL and 10.7% (n = 34) in the Lecture group) were found to be orphans who were taken care of by their relatives at home. On the other hand, 4.8% of the study participants (8.5% (n = 12) in a Pure PBL, 5.9% (n = 11) and 2.5% (n = 8) in the lecture group) had some forms of physical disabilities. The findings of other participants' characteristics were found as shown in table 1.

b) The Study Participants' Parent Characteristics

The study participants' parent characteristics were assessed in the current study, as the researcher was certain that they could influence the outcome of interest. As shown in table 4.1, only 6.3% of the study participants (3.5% (n = 25) in the PBL, 3.7% (n = 7) in the Hybrid PBL and 2.8% (n = 9) in a Lecture group) their parents had some forms of physical disabilities. It was furthermore; found that out of 467 of the study participants, their parents (40.2% fathers and 47.9%mothers) had primary level of education while 18.1% of study participants' fathers and 25.1% of their mothers had never gone to school (formal education). Moreover, the majority of parents of the study participants (83.6% fathers and 84.9% mothers) were self-employed against 4.6% of their fathers and 9.1% mothers who were not engaged in any wage employment. Other findings of the characteristics of the study participants' parents were as shown in the table.

c) Family Structure of the Study Participants

The findings of this study indicated that out of 647 study participants, 55.8% of their parents lived together in the same house at homes. Furthermore, it was observed that 60.3% of 647 study participants were living with both parents in the same households contrary to 19.9% of them who were living with relatives. In addition to that, the father headed the majority (77.3%) of the study participants' families. In the face of that, 52.1% of the study participants were reared in nuclear families against the participants who lived in extended families. Other findings of the study participants' family structures were as it is shown in table 1.

d) Child-Parent Communication on Sexual and Reproductive Health Matters

The current study believed that studying this variable could be valuable in determining its influence on the level of knowledge about SRH, level of sexual practices, and level of non-cognitive (soft) skills among the study participants over the PBL approach. Findings in Table 1 indicate that very few (26.7%) out of 674 study participants had opportunities to sometimes (17.3%) talk with their parents about SRH matter in which they rarely (2.3%) discussed contraception methods including condom use. Other observations under this aspect were found as presented in the table.

e) Environmental Characteristics where the Study Participants were living

This variable was one among the others, which the researcher of this study hypothesized it could influence the outcomes of interest contrary to the PBL approach. Table 1 signposts that 59.3% of the study respondents were living in parents' own houses whereas 26.6% in rented houses and very few (14.0%) in their relatives' houses. 51.0% of the study participant walked on foot, which out of 647 study participants, 60% took less than 60 minutes to reach their schools regardless of the means of transport they used.

However, findings of this study revealed that of the 647 participants, 66.9% were found to have the habits of sleeping two or more family members in the same room within the household. Additionally, study findings uncovered that out of 647 study participants 63.2% tended to sleep two or more family members in one bed. On the other hand, 62.4% of the 647 study participants were found to have a history of traveling away from home for more than a month for different purposes including visiting to greet relatives and friends. Other environmental characteristics were observed as indicated in the table.

f) Parental Financial Protection, Social Cohesion, Sexual belief, Exposure to Media and Exposure to Drug Abuse among the Study Participants

The above-headed aspects were also determined for their relationship on the outcomes of interest and descriptively presented in this study. As it is disclosed in table 1 that despite 73.6% of the study participants (n = 647) had strong social cohesion (good relationships with families, relatives/teachers, or friends), the majority (67.4%) of them had no parental financial protection.

In contrast, they were also assessed about their sexual beliefs It was revealed that 72.2% of the total study participants (n = 647) had negative sexual beliefs, which means that practicing sex early in young ages has no adverse effects on socioeconomic, cultural, health and education prosperity. Moreover, findings showed that 98.6% of the study participants were exposed to media (either radio, television, magazines, or mobile

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phones). The minority (12.8%) of the participants who were involved in this study were found to be exposed to drug abuse (smoking or alcohol use). Table 1 presents more findings of the socio-demographic characteristics of the study participants and other associated determinants of the outcomes of interest under the study.

Table 1: Characteristics of respondents of the questionnaire (n = 647)

Variable	
Age in years	
Mean Age in years	15 Yrs.
Minimum in years	12 Yrs.
Maximum in years	19 Yrs.
Variable	n (%)
Age Groups	
10 to 12 yrs.	58(9.0%)
13 to 16 yrs.	461(71.3)
17 to 19 yrs.	128(19.8%)
Birth space	
1st Born	418(64.6%)
Last Born	229(35.4%)
Gender	
Male	275(42.5%)
Female	372(57.5%)
Religion	
Christian	195(30.1%)
Muslim	452(69.9%)
Orphanage	
Yes	66(10.2%)
No	581(89.8%)
Current year of study in school	
First-year	275(42.5%)
Second-year	174(26.9%)
Third-year	198(30.6%)
Disability	
Yes	31(4.8%)
No	616(95.2%)
Parent Characteristics	
Parents have any Disability	
Yes	21(3.2%)
No	626(96.8%)
The education level of Father	
Never gone to School	117(18.1%)
Primary Education	260(40.2%)
Secondary Education	174(26.9%)
College/University	96(14.8)
The education level of Mother	
Never gone to School	163(25.2%)
Primary Education	310(47.9%)
Secondary Education	49(7.6%)
College/University	125(19.3%)
Occupation of Father	
Self Employed	541(83.6%)
Government/NGOs Employ	76(11.7%)
Not working	30(4.6%)
Occupation of Mother	
Self Employed	549(84.9%)
Government/NGOs Employ	39(6.0%)
Not working	59(9.1%)
Family Structure	
Parents living together in the same Household	
Yes	361(55.8%)
No	286(44.2%)
Living with Whom	
Both Parents	390(60.3%)

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Father only	37(5.7%)
Mother Only	91(14.1%)
Relative/Friends	129(19.9%)
Type of family	
Nuclear Family	337(52.1%)
Extended family	310(47.9%)
Head of the family at Home	
Father	500(77.3%)
Mother	73(11.3%)
Relative	74(11.4%)
Child-Parent Communication on Sexual and Reproductive Health	
Communicated with parents on SRH matters	
Yes	173(26.7%)
No	474(73.3%)
Frequencies of communicating with parents on SRH matters	
Always	59(9.1%)
Sometimes	114(17.6)
Never communicated	474(73.3%)
Matters communicated with parents about SRH	
Never Communicated	474(73.3%)
Contraception/Condom	18(2.8%)
STIs	86(13.3%)
Unwanted Pregnancies	82(12.7%)
Sexual relationships	25(3.9%)
Environmental Characteristics	
Nature of the house at home	
Rent house	172(26.6%)
Parents' house	384(59.4%)
Relatives' House	91(14.1%)
Number of people sleeping together in one room at home	
One (Alone)	214(33.1%)
Two and above	433(66.9%)
Number of people sleeping together in one bed at home	
One (Alone)	238(36.8%)
Two and above	409(63.2%)
History of travel away from home for more than a month	
Yes	404(62.4%)
No	243(37.6%)
Hours used to reach to school	
<60 minutes	388(60.0%)
One hr and above	259(40.0%)
Means of transport used to reach school	
On foot	395(61.1%)
Public transport	201(31.1%)
Bicycle	73(11.3%)
Motorcycle	208(32.1%)
Financial and Capital Protection	
Parental Financial Protection	
Yes	211(32.6%)
No	436(67.4%)
Social Cohesion	
Status of Social Cohesion	
Yes	476(73.6%)
No	171(26.4%)
Sexual belief	
Positive	180(27.8%)
Negative	467(72.2%)
Exposure to Media	
Yes	638(98.6%)
No	9(1.4%)
Exposure to Drug Abuse	
Yes	83(12.8%)
No	564(87.2%)

Source: Field Data (2020)

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g) *Levels of Non-cognitive (Soft) Skills for Safe Sexual Behavior among the Study Respondents*

Table 2 shows that of 647 study respondents only 14.2% (n = 92) were found to have adequate non-cognitive skills for safe sexual behaviors.

Table 2: Levels of Non-cognitive (Soft) Skills for Safe Sexual Behavior among the Study Respondents (n = 647)

Variable	n(%)
Non-cognitive Skills	
Adequate	92(14.2%)
Inadequate	555(85.8%)

Source: Field Data (2020)

h) *Levels of Non-cognitive Skills for Safe Sexual Behavior among the Study Respondents per Sampled Regions and Districts*

The current study stratified the levels of non-cognitive skills for safe sexual behavior among the study respondents based on their regions and districts. Findings in Table 3 indicate that number of study respondents with adequate non-cognitive skills for safe sexual behaviors ranged between 13.3% (n = 17) in Lindi District council to 16.3% (n = 36) at Dodoma city council. However, there were no statistically significant differences in the levels of non-cognitive skills for safe sexual behavior among the study respondents of both regions (Dodoma and Lindi) and districts (Dodoma, Kondoa, Lindi, and Kilwa) respectively (p>0.05).

Table 3: Levels of Non-cognitive Skills for Safe Sexual Behavior among the Study Respondents per Sampled Regions and Districts (n = 467)

Variable	Non-cognitive Skills		Chi-Square p-value
	Adequate n(%)	Inadequate n(%)	
Regions			
Dodoma	60(14.2)	362(85.8)	0.999
Lindi	32(14.2)	193(85.8)	
Districts Councils			
Dodoma	36(16.3)	185(83.7)	
Kondoa	24(11.9)	177(88.1)	0.605
Lindi	17(13.3)	111(86.7)	
Kilwa	15(15.5)	82(84.5)	

Source: Field Data (2020)

i) *Domains of Non-cognitive (Soft) Skills for Safe Sexual Behavior among the Study Respondents*

Table 4 depicts the frequencies and percentages of the four non-cognitive skill domains for safe sexual behavior among the study respondents. Although they demonstrated inadequate non-cognitive skills for safe sexual behavior in all domains, 22.1% (n = 143) of them had adequate non-cognitive skills on withstanding sexual coercions. Few respondents (8.8%) had intentions to abstain from engaging in sexual activities.

Table 4: Domains of Non-cognitive (Soft) Skills for Safe Sexual Behavior among the Study Respondents (n = 647)

Variable	n(%)
Intention to Abstinence Skills	
Yes	57(8.8%)
No	590(91.2%)
Intention to Negotiate Condom Use	
Yes	132(20.4%)
No	515(79.6%)
Self-Esteem	
Yes	78(12.1%)
No	569(87.9%)
Assertiveness Skills	
Yes	143(22.1%)
No	504(77.9%)

Source: Field Data (2020)

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j) Factors Related with the Level of Non-cognitive Skills for Safe Sexual Behavior among the Study Respondents

A descriptive analysis through chi-square and cross-tabulation was conducted in this study to determine the relationship between categorical variables. The twenty-nine (28) variables were subjected to chi-square test and cross-tabulation over the dependent variable (Levels of non-cognitive skills for safe sexual behavior). Findings in Table 5 show that gender of the study participants, walking on foot as a means to reach school, and parental financial protection to adolescents was statistically significantly related to the levels of non-cognitive skills for safe sexual behavior among the study participants ($p<0.05$). Other variables were found not significantly related to the levels of soft skills as shown in the table ($p>0.05$).

Table 5: Factors Related to the Level of Non-cognitive Skills for Safe Sexual Behavior among the Study Respondents (n = 647)

Variable	Levels of Non-cognitive Skills		p-value
	Adequate n (%)	Inadequate n (%)	
Age Groups			
10 to 12 yrs.	6(10.3%)	52(89.7%)	
13 to 16 yrs.	66(14.3%)	395(85.7%)	0.630
17 to 19 yrs.	20(15.6%)	108(84.4%)	
Birth space			
1st Born	56(13.4%)	362(86.6%)	0.418
Last Born	36(15.7%)	193(84.3%)	
Gender			
Male	29(10.5%)	246(89.5%)	0.021
Female	63(16.9%)	309(83.1%)	
Religion			
Christian	24(12.3%)	171(87.7%)	0.360
Muslim	68(15.0%)	384(85.0%)	
Orphanage			
Yes	8(12.1%)	58(87.9%)	0.607
No	84(14.5%)	497(85.5%)	
Current year of study in school			
First-year	43(15.6%)	232(84.4%)	
Second-year	17(9.8%)	157(90.2%)	0.143
Third-year	32(16.2%)	166(83.8%)	
Any Disability			
Yes	7(22.6%)	24(77.4%)	0.172
No	85(13.8%)	531(86.2%)	
Parent Characteristics			
Parents have any Disability			
Yes	6(28.6%)	15(71.4%)	0.056
No	86(13.7%)	540(86.3%)	
The education level of Father			
Never gone to School	21(17.9%)	96(82.1%)	
Primary Education	39(15.0%)	221(85.0%)	0.217
Secondary Education	17(9.8%)	157(90.2%)	
College/University	15(15.6%)	81(84.4%)	
The education level of Mother			
Never gone to School	26(16.0%)	137(84.0%)	
Primary Education	49(15.8%)	261(84.2%)	0.260
Secondary Education	4(8.2%)	45(91.8%)	
College/University	13(10.4%)	112(89.6%)	
Occupation of Father			
Self Employed	76(14.0%)	465(86.0%)	0.636
Government/NGOs Employ	10(13.2%)	66(86.8%)	
Not working	6(20.0%)	24(80.0%)	
Occupation of Mother			
Self Employed	75(13.7%)	474(86.3%)	
Government/NGOs Employ	5(12.8%)	34(87.2%)	0.365
Not working	12(20.3%)	47(79.7%)	
Parents living together in the same Household			

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Yes	49(13.6%)	312(86.4%)	
No	43(15.0%)	243(85.0%)	0.597
Living with Whom			
Both Parents	62(15.9%)	328(84.1%)	
Father only	3(8.1%)	34(91.9%)	0.437
Mother Only	11(12.1%)	80(87.9%)	
Relative/Friends	16(12.4%)	113(87.6%)	
Type of Family			
Nuclear	43(12.8%)	294(87.2%)	0.268
Extended	49(15.8%)	261(84.2%)	
Head of the family at Home			
Father	70(14.0%)	430(86.0%)	
Mother	10(13.7%)	63(86.3%)	0.870
Relative	12(16.2%)	62(83.8%)	
Communicated with parents on SRH matters			
Yes			
No	20(11.6%)	153(88.4%)	0.242
	72(15.2%)	402(84.8%)	
Nature of the house at home			
Rent house	23(13.4%)	149(86.6%)	
Parents' house	56(14.6%)	328(85.4%)	0.931
Relatives' House	13(14.3%)	78(85.7%)	
Number of people sleeping together in one room at home			
One (Alone)			
Two and above	32(15.0%)	182(85.0%)	
	60(13.9%)	373(86.1%)	0.707
Number of people sleeping together in one bed at home			
One (Alone)			
Two and above	33(13.9%)	205(86.1%)	
	59(14.4%)	350(85.6%)	0.844
History of travel away for more than a month (Mobility)			
Yes			
No	59(14.6%)	345(85.4%)	0.718
	33(13.6%)	210(86.4%)	
Means of transport used to reach school			
On foot			
Public transport	45(11.4%)	350(88.6%)	0.010
Bicycle	35(17.4%)	166(82.6%)	0.118
Motorcycle	10(13.7%)	63(86.3%)	0.892
	27(13.0%)	181(87.0%)	0.535
Time to reach School			
<60 minutes	54(13.9%)	334(86.1%)	0.788
1 hr. and above	38(14.7%)	221(85.3%)	
Financial and Capital Protection			
Yes	21(10.0%)	190(90.0%)	0.031
No	71(16.3%)	365(83.7%)	
Status of Social Cohesion			
Yes	69(14.5%)	407(85.5%)	0.737
No	23(13.5%)	148(86.5%)	
Sexual belief			
Positive	21(11.7%)	159(88.3%)	0.248
Negative	71(15.2%)	396(84.8%)	
Exposure to Media			
Yes	91(14.3%)	547(85.7%)	0.788
No	1(11.1%)	8(88.9%)	
Exposure to Drug Abuse			
Yes	16(19.3%)	67(80.7%)	0.158
No	76(13.5%)	488(86.5%)	

Source: Field Data (2020)

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k) Factors Associated with the Level of Non-cognitive Skills for Safe Sexual Behavior among the Study Respondents

A binary logistic regression was performed to determine the extent of an association to which variables (gender of the study participants, walking on foot as a means of reaching schools, and parental financial protection) had, on the non-cognitive skills for safe sexual behavior among the study participants. Table 6 indicates that with the control of other factors, male participants were found to be more times likely to have non-cognitive skills for safe sexual behavior than female participants (AOR = 1.740; p<0.05; 95% CI: 1.082, 2.797).

Furthermore, the study participants who used to walk on foot to reach schools were 1.836 (AOR) more times likely to have non-cognitive skills for safe sexual behavior as compared to participants who used other means of transports such as bicycles, public min-buses, and motorcycles to reach schools (p<0.05; 95% CI: 1.172, 2.875). Nevertheless, findings in table 4.8 revealed that the study participants who had adequate parental financial protection were found to be more times likely to have non-cognitive skills for safe sexual behavior against those who had not (AOR = 1.865; P<0.05; 95% CI: 1.106, 3.146).

Table 6: Factors Associated with the Levels of Non-cognitive Skills for Safe Sexual Behavior among the Study Respondents (n = 647)

Variable	OR(P-val)	95% CI Low; Upper	AOR(P-val)	95% CI Low; Upper
Gender				
Male	1.729(0.023)	1.080; 2.769	1.740(0.022)	1.082; 2.797
Female (Ref)				
Walking on Foot to Reach School				
Yes				
No (Ref)	1.783(0.011)	1.144; 2.779	1.836(0.008)	1.172; 2.875
Parental Financial Protection				
Yes				
No (Ref)	1.760 (0.032)	1.049; 2.953	1.865(0.019)	1.106; 3.146

Source: Field Data (2020)

VI. Discussion

a) Levels of Non-cognitive Skills among the Study Respondents

A non-cognitive skill among adolescents is a topic that is becoming more relevant due to implications for the health of this population. The alarming statistics on STIs/HIV, unwanted teenage pregnancies, school dropouts, poverty among others, unsafe sexual behavior problems need to be addressed accordingly. Thus, the current study was done to learn about non-cognitive skills and its associated determinants for safe sexual behavior among school-going adolescents in Tanzania.

Based on the findings presented here, this study demonstrates that school-going adolescents suffer from inadequate non-cognitive skills for safe sexual behaviors. Many of them demonstrated low intention to abstain from sex, intention to use a condom during their sexual intercourses, unable to withstand sexual dilemmas, and sexual coercions respectively. This would make them more prone to engage in unsafe sexual activities that would expose them to unintended pregnancies and their related obstetric complications including abortions, stillbirths, preeclampsia and eclampsia, and or fistula, STIs/HIV, and school dropouts. Several factors were observed to have significant influence to empower school-going adolescents with adequate non-cognitive skills for safe sexual behaviors including their biological makeup (gender), the means of transport they used to go to school (walking on foot), and parental financial protections.

It was revealed that the more the adolescents walked on foot to school, there more they developed adequate non-cognitive skills for safe sexual behaviors probably because they might have been frequently taught and reminded either at home or school on how to say "NO" to sexual advance and stick to it. Besides, they might have been exposed and get used to sexual coercion and dilemma to the level they developed mechanisms to defend themselves against it. On the other hand, the current study found that the more the school-going adolescents were provided with adequate financial protection by their parents including emotional attachment, and close parental communication, advice, and or monitoring the more they acquired adequate skills for safe sexual behavior. This fact gives light that good parenting gives hope and confidence to children for them to feel protected and secured enough that other people or the environment would do so.

Thus, if parents, relatives, and or caregivers were as close to their children as possible, it would

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positively impact non-cognitive skills for safe sexual behaviors among school-going adolescents. The findings of this study tally with those of Kalolo and Kibusi (47) in their study about perceived behavior control among adolescents. They found 49.7% of the sampled adolescents did not use a condom at their last sexual intercourse and 49.8% had multiple sex partners between the ages of 14 to 17 years. These findings uncovered inadequate levels of non-cognitive skills for safe sex among adolescents that needed to be addressed through safe sex promotion interventions.

In the same vein, Dessie *et al.,*(48)in their study about parent-adolescent sexual and reproductive health communication, found that if adolescents are poorly close and communicating with their parents on sexual and reproductive health, they lack parental security and thus non-cognitive skills for safe sex. Additionally, Castillo-Arcos *et al.,*(49) in their cross-section and explanatory study about resilience on sexual risk behavior of STI among adolescents revealed that early adolescents had lower levels of resilience compared to their counterparts older adolescents. Their findings tally with those of this study as they both imply the need for more interventional studies of sexual risk behaviors among adolescents and factors that affect such conduct.

However, contrary to the cross-sectional findings of this study, Reis *et al.,*(50)determine the effect of sex education in promoting sexual and reproductive health among young people in Portugal. They found most young people had adequate skills of condom use after an intervention. Their findings implied that, without age-appropriate sexual and reproductive health interventions, young people lack adequate skills for safe sex. Moreover, Costa *et al.,*(51) in their study about the impact of age on cognitive variables and safe sex found that young women reported higher concerns on infrequent condom use and abstinence, findings which are different from those found in this study. Different study populations who had different socio-demographic too could be attributed to the difference of these findings. Thus, the findings of this study and those of previous studies unfold the truth that, without being empowered through sexual and reproductive health interventions, adolescents lack adequate skills for safe sexual behaviors.

VII. Conclusion

Referring to the findings above, it can be concluded that most sampled adolescents lack adequate non-cognitive skills for safe sexual behaviors. They demonstrated low skills to abstain from sexual behavior, negotiate condom use, and thus, they had low self-esteem and assertiveness skills for safe sexual behavior. Owing to vital biological processes they adolescents are going through, social and cultural norms that rule over them, and findings from this study, adolescents were more likely to perform unsafe sexual activities. Among other predictor variables, which were tested in this study, the gender of the respondents, means of transport they used to go to school, and parental financial protection from their parents were observed to be associated with the levels of non-cognitive skills.

These factors played an important role in addressing the skills gap since they have been observed in this study that they provide positive empowerment to assist school-going adolescents to develop non-cognitive skills for safe sex. The findings of this study are relevant to the health and educational policies to revisit and refine the existing strategic plans in favor of the potentials of adolescents their educational and sexual and reproductive health prosperity. Moreover, the design of sexual and reproductive health prevention programs and or interventions, need to throw an eye in promoting, emphasizing, and prioritizing sexual and reproductive health information through a variety of innovative teaching and learning pedagogical approaches that focus on involving adolescents in solving their sexual life encounters.

For the education and health professionals, findings of this study provide an opportunity to invest and direct efforts to help improve the existing curricula and or syllabus in a way that promotes non-cognitive skills for safe sex among adolescents. This is of very great potential, as it will help this population to become sexually healthy adults, with the ability to avoid and or make informed decisions over sexual activities.

Declarations

'Ethics approval and consent to participate: applicable', approved by the University of Dodoma (UDOM) Institutional Research Review Committee (IRRC)'.

'Ethics Clearance to reach schools: approved by education officers of the respective schools in the regions and districts of the sample.

'Consent for publication: not applicable'

'Informed Consent: parents/teacher or legally acceptable representatives were asked for a written informed consent on behalf of the study respondents for their participation in this study.'

'Availability of Data and Materials: not applicable

'Competing interest: none'.

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'Author's contributions: W.C.M (MSc. & PhD candidate) performed research, analyzed data, and wrote the manuscript; K.MO appraised research materials, reviewed and reshaped the concept of this work; S.M.K.

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shaped the research idea/concept and research tools, and H.B. edited this work.

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List of Abbreviations

AIDS……Acquired Immunodeficiency Syndrome
HIV……..Human Immunodeficiency Virus
MOEVT……..Ministry of Education and Vocational Training
MoHCDGEC…….....Ministry of Health Community Development, Gender Elderly, and Children
IRRC……Institutional Research Review Committee
PBL……...Problem-based Learning
PO-RALC…….Permanent Secretary Regional Administration and Local Government
OBL……..Outcome-Based Learning
SPSS…….....Statistical Package for Service Solution
STIs…….....Sexual Transmitted Infections
UDOM……..University of Dodoma
WHO…….World Health Organization

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