# School-based sexual and reproductive health education among adolescents in developing countries

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**ABSTRACT**

The increase in risky sexual behavior among adolescents indicates the need to strengthen sexual and reproductive health. Schools have an essential role, but few studies are related to mapping models of school-based sex and reproductive education for adolescents in developing countries. This scoping review examines school-based sexual and reproductive health education among adolescents in developing countries. A systematic approach was used to search the literature through 5 electronic databases: Science Direct, EBSCO, PubMed, CrossReff, and Proquest. Subsequently, two reviewers conducted a conformity analysis with the inclusion/exclusion criteria, and then the search results that met the requirements were analyzed descriptively. A total of 14 articles met the inclusion criteria. The model of sexual health education in schools comprises digital-based education, peer groups, and comprehensive sex education to improve life skills. Barriers to implementation include culture, traditional norms, organization, commitment, and supporting resources. The supporting factors are student enthusiasm, exciting methods and media, community, and parental support. School-based sexual and reproductive education increases knowledge and attitudes about sexual health. Therefore, there is a need for a comprehensive sexual education model integrated into the school curriculum using attractive media and involving several well-organized stakeholders.

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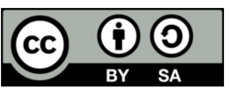


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## 1. INTRODUCTION

Adolescents aged 10-19 years represent 8% of the world's total population, approximately 1.2 billion. Furthermore, the estimated population of those aged 10-24 years worldwide reaches 1.8 billion and has become the largest in history, with most of them living in developing countries [1]. Adolescence is a period of transition from childhood to adulthood and is marked by various changes, namely physical, social, emotional, and cognitive [2]. The rapid development of the reproductive organs in the transition phase causes sexual changes such as menstruation, wet dreams, and the start of sexual activity [3]. Adolescents are growing and developing with greater access to formal education, the internet, technology, and influences from various sources related to attitudes and behavior.

Social changes occur during adolescence, while the influence of norms and culture regarding their roles as women and men might create gender problems [4]. The changes that mainly occur in adolescents are not accompanied by adequate preparation. Hence, this age group is vulnerable to various issues, including

sexual and reproductive health. A survey conducted on 15,318 adolescents schooling in Sub-Saharan Africa (SSA) showed that 43.5% had engaged in sexual intercourse, while 20.9% had sex with multiple partners. human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) is the leading cause of death among adolescents aged 10-19 years in SSA [5]. The National Survey of Sexual Attitudes and Lifestyle in the UK stated that three-tenths of people between 16 and 24 had sexual intercourse before the age of 16 [6]. A large number of Saudi teenage boys have negative attitudes towards sexual activities such as masturbating daily and engaging in risky sexual behavior [7].

Challenges in adolescent sexual and reproductive health constitute one of the global health problems. Risk sexual behavior harms their health and academics through sexually transmitted infections (STIs), unwanted pregnancies, HIV/AIDS, unsafe abortion, and sexual violence [8]. Teenage pregnancy is a public health problem due to students' limited knowledge of the dangers of unwanted pregnancy and lack of communication and negotiation skills resulting in being trapped in risky sexual behavior with their partners [9]. Unwanted pregnancies in their teens impact premature births, low birth weight, neonatal deaths, and maternal deaths due to bleeding [10]. The effect is not only short-term but also long-term and experienced by individuals, groups, as well as countries because it affects the quality of life and correlates with various sectors such as social, educational, and economic [11].

Reproductive and sexual health education is a human right of every individual. However, this need has not been optimally met in adolescents due to a lack of knowledge, stigma, culture, law, and policies [12]. Evidence suggests that females who learn about sexual and reproductive health exhibit improved sexual behavior, particularly when initiating premarital sex and deciding whether to get married and have children [13], [14]. The results of the 1995 International Conference on Population and Development (ICPD) in Cairo underlined the importance of the government's efforts to provide sex education programs for adolescents to fulfill the need for information and skills in realizing sexual and reproductive health. Therefore, several countries have adopted policies to reduce risky sexual behavior in adolescents and improve reproductive health in adolescents [15].

School-based comprehensive programs play an essential role at the beginning of sex education and have been proven to reduce risky sexual behavior in adolescents [16]. Moreover, it becomes beneficial if the role of parents is not optimal in providing sex education to adolescents [17]. The results showed that student behavior had a positive relationship with activities at school. Students who have low grades in the school year or often skip school have risky sexual behavior compared to students who are diligent in school [18]. In addition, this intervention allows for collaboration with various parties. It is recommended for overcoming problems that have broad targets, such as strengthening sexual and reproductive health in adolescents [16], [17]. Studies on school-based sex and reproductive education programs for adolescents related to efforts to prevent risky sexual behavior and HIV in developing countries are rare. Especially those who conduct a review of the model used, supporting factors, inhibiting factors, and practical recommendations. Therefore, this scoping review aims to map out school-based interventions in several developing countries, the supporting and inhibiting factors for program implementation of school based sexual and reproductive health for adolescent, and practical recommendations.

## 2. METHOD

This study was a scoping review. This methodology was chosen because of the fast it can execute large-scale literature and mapping projects and the supporting data it provides. This might be helpful in preliminary research investigations since it helps highlight the scope and limitations of earlier studies [19]. This scoping review is based on the Arksey and O'Malleys Framework, which is described in 5 main stages [20]. Figure 1 shows the stages of the scoping review.

### 2.1. Identify study questions

There are three study questions in this scoping review which will be discussed. What is the school-based intervention model? What are the supporting and inhibiting factors? What are recommendations effective in improving adolescent reproductive health in developing countries?

### 2.2. Identify relevant studies

#### 2.2.1. Search method

The search was done on several electronic databases: Science Direct, EBSCO, Pubmed, and Proquest. It was performed manually using keywords, medical subheadings (MeSH), and text words as shown in Table 1. Considering that sexual and reproductive health is a unified meaning, it will still be included when discussing one or both. The keywords used are adolescent AND sex education AND school-based sexual and reproductive health program.

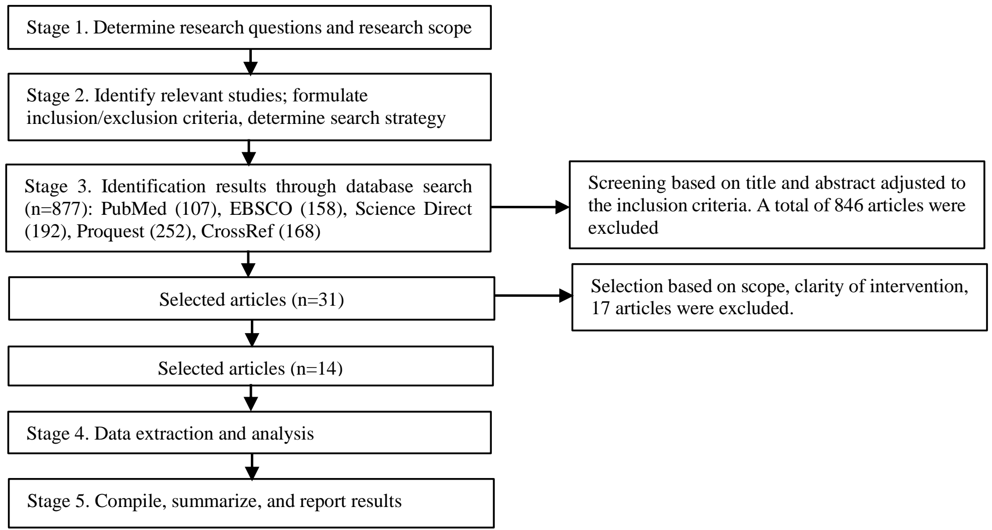


Figure 1. Scoping review stages

Table 1. Search strategy

| Category | Search parameters |
|---|---|
| Problems (P) | "adolescent"(MeSH Terms) OR teens (Text Word) OR youth (Text Word) |
| Intervention (I) | "Sex Education"(Mesh) AND "School Health Services"(Mesh) OR School Health Promotion (Text Word) |
| Control (C) | "Curriculum"(Mesh) |
| Outcome (O) | "Sexual Health"(Mesh)) AND "Reproductive Health"(Mesh) AND "Sexual Behavior"(Mesh)OR Sexual Activity (Text Word) OR Premarital Sex Behavior (Text Word) |

#### 2.2.2. Inclusion and exclusion criteria

The articles selected consisted of quantitative studies, mixed methods, school-based sexual and reproductive education interventions or school settings, and those targeted at adolescents aged 10-19 years. The article was published in 2010-2020. The articles must also be written in English, use a predetermined database, and be conducted in developing countries as defined by the International Monetary Fund (IMF). The exclusion criteria include articles published before 2010 that did not describe sex education in detail and those not accompanied by the full text.

### 2.3. Article screening

Two reviewers independently screened the title and abstract. The selection and inclusion criteria were also based on the agreement of these two reviewers. When there is a difference of opinion, the other study team reviews the article from the full text.

### 2.4. Mapping/data extraction

The data extraction process provides relevant information from a number of selected literatures. Data extraction focused on study details, objectives, methods, interventions, and results. Relevant data, including author, year of publication, and title, were also included in the extraction of each article presented in Table 2.

### 2.5. Presentation of results

The data extraction results were synthesized narratively to summarize and explore information on school-based sexual and reproductive education models for adolescents in each article. The results will be displayed as a theme for discussing the main findings. A database search found 877 articles detailing 107 from Pubmed, 158 from EBSCO, 192 from Science Direct, 252 from Proquesst, and 168 from CrossRef. Eight hundred forty-six articles were excluded because it is narrative or qualitative research, not school-based, and outside the adolescent age range. Furthermore, it was re-selected based on the suitability of scope and clarity of intervention so that 14 eligible articles were selected, then extraction and analysis were carried out.

Table 2. Data extraction: study design, sample, intervention, and findings

| No. | Ref. | Country | Sample | Study design | School-based interventions | Findings |
|---|---|---|---|---|---|---|
| 1. | [21] | China | 1,200 girls aged 11-14 years were selected randomly | Cluster-randomized controlled trial | "Salony" Strategy school-based intervention consisting of 10-hour sessions per month. | Increased knowledge and behavior of 3 aspects of nutrition and reproductive health: knowledge of early marriage age, desire to have children, and genital hygiene. |
| 2. | [22] | Tanzania | 147 students aged 12-27 years and 3 educators | Mixed method | The program consists of 16 sessions on male and female body parts, sexually transmitted diseases, pregnancy, and contraceptive methods. The number of students in a class is 25-50, lasting 45-60 minutes. | Student opinion: essential and interesting program. Teacher's view: the supporting factors are volunteers as educators, media, enthusiasm of students, and benefit feelings. The inhibiting factors: traditional culture, lack of funds, stakeholder coordination, and poor school scheduling. |
| 3. | [23] | Ghana | Middle school students aged 14-18 years old | Randomized controlled training | Educate students' using role-play strategies, games, quizzes, discussions, and teaching aids. The time between the pre-test and post-test is 7 weeks. | Increased knowledge of sexual health |
| 4. | [24] | Uganda | Quantitative: 864 students; focus discussion group (FGD): 50 people (students, teachers, parents, and peer educators) | Mixed method | Comprehensive sexual education with 11 lessons completed in 8 sessions (each session 1.5-2.5 hours) was developed by a team of various disciplines adhering to international sex education guidelines. | Supporting factors: support from the community (advisory board), various media and strategies, and high acceptance among stakeholders. Inhibiting factors include sociocultural norms, access to geography, time, and school-related factors |
| 5. | [25] | Indonesia | 2,413 students aged 9-14 years (baseline); | Pre-post-quasi-experimental design and cross-sectional | HIV prevention education consists of 4 sessions (@ 45 minutes) with materials and a participatory approach: role play, group discussions, case studies, and games. | Improving knowledge, attitudes, and skills in HIV prevention. |
| 6. | [26] | Kenya | 102 grade 7 students. FGD participants consisted of grade 10 students with their parents and teachers | Mixed method | 3 learning sessions concern risky sexual behavior, HIV testing, and pregnancy. Case discussion learning strategies, video screenings, role play, brainstorming. | Increased knowledge, attitudes, and awareness of students about safe sexual behavior. Teachers and parents: it is essential to teach sex education early to prevent adolescent risk behavior. |
| 7. | [27] | Rwanda | Students (n=1,950) participate | Students (n=1,950) participate | A non-randomized longitudinal controlled trial | The intervention consisted of 6 training days for 5 students (peer educators). Students as peer educators are chosen by the teacher. |
| 8. | [28] | Uganda | Students aged 12 and over | parallel-group randomized controlled trial | CyberSenga is an internet-based HIV prevention program with 5 sessions, each for 1 hour. | An increase in condom use and abstinence was observed 3 times. |
| 9. | [29] | Tanzania | 3,091 students with an average age of 12.4 years | Randomized controlled trial | Promoting sexual and reproductive health among adolescents in southern and eastern Africa (PREPARE) consists of 3 components, implementation by teachers, peer educators, and health service providers. | Delaying sexual initiation and planning the use of condoms. |
| 10 | [30] | Tanzania | 120 students range 11-15 years old | Mixed method | Sexual health education is presented discreetly digitally using computer games, 40 minutes per week for 5 weeks. | Students are satisfied; increased motivation, knowledge, attitudes, and engagement in sexual health education. |
| 11 | [31] | South Africa | 12-15 years old students | Randomized controlled training | Skhokho combines teaching materials and parenting programs. Students were observed for 18 months. | Decreased dating and sexual violence in the intervention group. |
| 12 | [32] | Kenya | 60 students aged 11-14 years old | Randomized controlled trial | Tumaini is an interactive, narrative android game based on socio-cognitive theory, played for 1 hour in 16 days. | Increased knowledge of sexual health, self-efficacy, and efforts to prevent risky sexual behavior. |
| 13 | [33] | Ethiopia | 560 students are randomly selected from grade 11 | Quasi-experiment | In a peer program, there is an election by teenagers, given training and then taught to their friends. | Increased knowledge of HIV, desire for HIV counseling and testing, and condom use. |
| 14 | [34] | Indonesia | 16-24 years old from high school, college, and community | Quasi-experiment | It provides education by giving SMS 2 times a week. Each participant received 12 SMS plus a reminder to participate in the survey evaluation. | Increased knowledge of sexual and reproductive health and ability about smoking. |

## 3. RESULTS AND DISCUSSION

### 3.1. Study description

A total of 9 and 5 studies in this review originated from the continents of Africa and Asia, respectively. Efforts to achieve adolescent sexual and reproductive health are still a global issue in developing countries, considering several policies and programs have been initiated. Still, their implementation has not been optimal [4]. Developing countries with various educational and socio-economic conditions promote schools to play a role in sex education because children do not get this information from their parents due to limited time, knowledge, and ability [25].

The most commonly used design was pre and post-test (n=10), while some quantitative studies were equipped with exploration. Hence, the method used was mixed (n=4). Furthermore, the targeted schools ranged from primary, secondary, to university; half of those studies had a sample of fewer than 15 years of age. The details of the school-based sexual and reproductive health program from the 14 articles are described in Table 2. Articles that met the inclusion criteria were grouped into several themes. Meanwhile, the themes focused in this review include sexual and reproductive health education models, supporting factors, barriers factors, and recommendations.

### 3.2. A school-based sexual and reproductive health education model

School-based sex education programs have proven to contribute toward improving sexual reproductive health and reducing risky sexual behavior. This intervention increased the knowledge, attitudes, and behaviors in sexual health, specifically in pregnancy prevention, as well as delaying sexual desire, condom use, and HIV prevention [18], [25], [29], [35]. In addition, it also minimizes the risk of spreading hoax information from friends about sexual and reproductive health [36]. The development of sex education programs in schools must consider existing guidelines such as the UNESCO school-based curriculum [37] and community background [22]. School-based sexual education is a solution to the problem of the absence of sex education at home by parents. This problem occurs for various reasons, such as the lack of parental knowledge of its importance or cultural reasons that still consider it taboo.

Policies on school-based sexual education are evidence-based and facilitate adolescent sexual diversity. Most policies emphasize abstinence from sexual behavior in adolescents and do not teach condom use as an effort to prevent unwanted pregnancies and STIs because they do not comply with local norms. In addition, there are also state policies that teach life skills such as sexual violence prevention, healthy relationships, communication, and decision-making [38].

Various models of school-based sexual and reproductive health education that have been carried out include education to improve life skills in HIV prevention [18], [25] the use of digital technology such as computers, mobile phones, and internet-based websites [28], [34] peer [27], [32] and comprehensive sexual education [22], [31], [33]. Comprehensive sexuality education has proven effective in increasing knowledge, attitudes, and skills related to healthy relationships and preventing sexual violence against children. It also improves communication skills, literacy skills, and emotional and social learning [39]. Comprehensive sexual education was the most widely practiced with positive contributions due to its holistic nature of viewing things from various perspectives and allowing cross-sectoral collaboration from health and education offices, and non-governmental organizations [36]. Comprehensive sexual education does not definitively prohibit sex before marriage. Nevertheless, it provides an understanding of sexual and reproductive rights and health to adolescents in a broad context. In turn, this provides knowledge and life skills that are applied in making decisions regarding their sexual behavior. Sexual education involving several parties will lead to material that is fun and tailored to the needs of adolescents who are experiencing various physical, social, and emotional developments.

The success of school-based sexual education varies from school to school. This is related to the efficacy and ability of teachers as facilitators, priorities of sexual education, and national and local policies [40]. The role of facilitators in implementing school-based sexual education is supported by training both before and during implementation and facilities owned by schools. School understanding of the importance of sexual education in adolescents, which all school residents share, encourages implementing sexual and reproductive health programs in schools.

#### 3.2.1. Contents of the material

The material provided in comprehensive sexual education includes cognitive, emotional, physical, and social aspects related to sexuality that can give adolescents responsible independence in making the right decisions about their sexual health. The material presented is specific on sexual and reproductive health and non-specific reproductive health. Several studies provided materials ranging from reproductive organs, HIV and its prevention, sexually transmitted diseases, contraception, and pregnancy. In addition, specific materials related non reproductive health like communication skills, decision-making, respect for the body, prevention of sexual violence, motivation for healthy living, healthy relationships, and prevention of illegal drug use were also obtained

[28], [30], [32], [34]. However, due to cultural influences and religious norms in Zambia, teachers only teach about sexual abstinence and do not teach about the use of contraception or pregnancy prevention [41]. It is a concern that comprehensive sexuality education can be accepted and implemented. It is necessary to improve sexual and reproductive health services and regularly monitor the program [42]. The appropriate interventions or material for each country should be on the local context and target group.

#### 3.2.2. Teaching strategy

Most of the teaching strategies in this study used the active participation of students as recipients of education with various methods such as roleplay, brainstorming, group discussions, intergroup competitions, case studies, games, and quizzes. Role-playing games created for African and American youth can be educational modalities for sexual health [43]. The settings used were the classroom, digital platform, and outside the classroom. Moreover, the sessions used in teaching varied from 1 session up to a maximum of 16 [22], [23], [32]. The time allocation for each session also varied from 45 minutes [21] to a maximum of 1.5–2 hours [44]. The evaluation was conducted after the intervention; some studies performed follow-up at seven weeks, 3, and 6 up to 18 months of observation.

#### 3.2.3. Parties involved

This study involved several parties in the implementation of school-based sexual and reproductive health education, such as non-governmental organizations, government agencies including education and health offices, as well as parents, health, and social workers [22]. From the school aspect, it involved teachers who are concerned about the sexual and reproductive health of adolescents and also principals. In addition, the youth themselves are also involved as peer educators [27], [33]. The party responsible for implementing school-based sexual education is adjusted to the policies of the region or country. Without regulations that govern, there will be a debate. For example, in Saudi Arabia, the parties considered responsible are the Ministry of Health and the Ministry of Education (teacher as educator) and scholars [45]. This could be occurring because sexual education is oriented from a Western viewpoint. Related parties in a particular country or region need to make adjustments that abide by local norms.

Peer educators provide an opportunity to increase the frequency of discussing sexual and reproductive health materials for fellow adolescents compared to discussing material by adults. The involvement of peer educators is considered adequate and inexpensive because the delivery of material also utilizes youth social media so that the reach is wider [46]. Adolescents are more comfortable discussing sexual and reproductive health with peer educators. This results from not feeling patronized, being in the same stages of development and frame of mind, or the ability to share information with friends about appropriate sexual and reproductive health.

### 3.3. Barriers to the implementation of sexual health and reproductive education in developing countries

Two articles describe the barriers to implementing sexual and reproductive health programs for school-based youth. Cultural barriers and traditional norms [22], [24] as well as its diversity, are often associated with the perceived taboo to teaching sex education because it is a sensitive topic, finally creating confusion in the formulation of the suitable model [47]. This can be circumvented by disclosing information and involving community leaders to open their horizons. This challenge can be overcome by disclosure of data and involving community leaders to broaden their horizons. This was exhibited by the program initiated by Aahung in Pakistan. It was called life skills education, not sex education, because of the stigma circulating in society [48]. The content of education is not only narrowly focused on sexuality but is expanded to include communication, decision-making, and behavior. The change was made to adapt health education so that it can be given to adolescents and the community less awkwardly because of the word sexual.

Other inhibiting factors include a need for more funds, coordination between stakeholders, and poor school scheduling [22]. The barriers of geographical conditions cause one to miss information. School-related factors such as schedule, a curriculum that has not integrated sexual and reproductive health issues, and teacher limitations in delivering sexual and reproductive health [44]. In addition, the rules of the model and the unattractive delivery method made students reluctant and uncomfortable to pay attention.

Regarding time constraints, lack of resources, and suboptimal school organization, this can be overcome by increasing communication networks and integrating comprehensive sexual education into the school curriculum. The educators can be teachers, older adults, and peers as described by a study conducted in Ghana. Reproductive health education provided in schools can increase knowledge to prevent premarital sex behavior [49]. It is, therefore, essential to include reproductive health materials in school subjects such as Biology or others tailored to each country's curriculum content.

### 3.4. Factors supporting the implementation of sexual and reproductive health education in developing countries

The supporting factors that became the main point of this study were attractive media and delivery strategies [22], [44]. The process for implementing an educational intervention for young people needs to pay attention to media diversity. The existence of messages that complement each other makes the delivery effective, for example, discussions in class, using videos, posters, games, and discussions [46]. Sexual reproductive health interventions provided to adolescents must be responsive to the needs of adolescents, prioritize participation, be delivered through various platforms, utilize multisectoral collaboration, and strengthen accountability [50].

Most who have implemented sexual education feel that the factor that facilitates the implementation of sexual education in schools is the independence of schools in developing projects related to sexual education, where success increases if included in intra- and extra-curricular. In addition, there is a special team for sexual education, support from the education office in the form of policies, and schools have partnerships [47]. Policies from the education office and other parties realized by school support implementing school-based sexual education.

There are also foreign volunteers as educators for students, positive support from the community, acceptance of parents, exciting media and teaching strategies, enthusiasm for students towards learning, and awareness that sexual and reproductive education brings benefits [22]. Education provided from early life is also essential and supports the success of preventing risky sexual behavior in adolescents [26]. Children who receive sexual education early will be familiarized and have a foundation related to sexual health. During the following stages of development, it will be easier to receive information about sexual education without feeling awkward or embarrassed.

### 3.5. Recommendations

Recommendations for good adolescent school-based sexual education models are as follows: programming must consider the wishes and needs of students, gender, and background as participants, as well as educators and parents and culturally sensitive [22], [48], [50]. Integrated interventions must be based on empathy, self-efficacy, and emotional well-being and easy to comprehend, but discussed separately and not incorporated into other subjects [21]. Involve peers, parents, and several related stakeholders packaged in a short, easy-to-implement, and fun form [33], [45], [47]. Using innovative, up-to-date learning media and interesting learning strategies [2], [25], [36] and allocating programs with longer educational time will be more efficacious [23].

## 4. CONCLUSION

The findings of this scoping study have implications for research and education, specifically that adolescents who lack access to it from their parents need sexual and reproductive education at school. Sexual education should be innovative, engaging, culturally sensitive, and fun comprehensive sex education has effectively increased knowledge, attitudes, and behaviors related to sexual health. Implementing school-based interventions can be strengthened by integrating them into the curriculum with cross-sectoral collaboration.

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