Community Research

Developing an online reproductive health module on sexually transmitted infections for Indonesian adolescents: a qualitative mixed methods study

Hanny Nilasari[1], Wresti Indriatmi[1], Hartono Gunardi[2], I Putu Gede Kayika[3], Aria Kekalih[4], Kemal Nazaruddin Siregar[5], Kristian Kurniawan[6], Elvira Lesmana[6], Rose Amalia Haswinzky[6]

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Authors' affiliations:
[1]Department of Dermatology and Venereology, Faculty of Medicine, Universitas Indonesia, Cipto Mangunkusumo Hospital, Jakarta, Indonesia, [2]Department of Pediatrics, Faculty of Medicine, Universitas Indonesia, Cipto Mangunkusumo Hospital, Jakarta, Indonesia, [3]Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Indonesia, Cipto Mangunkusumo Hospital, Jakarta, Indonesia, [4]Department of Community Medicine, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia, [5]Department of Biostatistics and Population Studies, Faculty of Public Health, Universitas Indonesia, Depok, Indonesia, [6]Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia

Corresponding author:
Hanny Nilasari
Department of Dermatology and Venereology, Faculty of Medicine, Universitas Indonesia, Cipto Mangunkusumo Hospital, Jalan Salemba Raya No. 6, Central Jakarta 10430, DKI Jakarta, Indonesia
Tel/Fax: +62-21-31935383
E-mail: hannynilasari.deptkulitrscm@gmail.com

ABSTRACT

BACKGROUND A notable rise in sexually transmitted infection (STI) cases among youth correlates with a lack of reproductive health awareness, affecting nearly 80% of Indonesian adolescents. Additionally, sociocultural taboo acts as a challenge to reproductive health implementation in Indonesia. Therefore, this study aimed to develop an online reproductive health module focused on STIs for Indonesian adolescents.

METHODS This research was a mixed methods approach, integrating quantitative study using univariate analysis (survey and questionnaire) and qualitative study using the Delphi method (open discussion and focus group discussion). The study was conducted between March 2 and July 28, 2022. We began by conceptualizing a literature-based module, an online survey, and virtual discussions involving students, teachers, and parents. Then, we consulted with clinical psychologists and dermatovenereologists. Additionally, students completed an assessment to establish a baseline of their knowledge, attitudes, and behaviors (KAB) regarding reproductive health and STIs.

RESULTS Of 327 high school students across Jakarta, analysis of the 129 completed KAB surveys showed that only 56.6% and 65.1% attained acceptable scores (>65) for knowledge and behavior, respectively, with 24.8% being at risk for STIs. Key recommendations included incorporating multimedia elements, ensuring clarity and simplicity in language, adopting non-judgmental tone, providing comprehensive explanations of STIs and their long-term impact, and supporting learning with face-to-face sessions and ongoing access to concise, cost-effective educational resources.

CONCLUSIONS Adolescents need a comprehensive, interactive, instructive, accessible, non-discriminatory reproductive module that strengthens the self-concept that upholds Indonesian values and norms.

KEYWORDS adolescent, Indonesia, online learning, prevention, reproductive health, STI

The World Health Organization defines "adolescents" as individuals aged 10–19 years, while the Regulation of the Minister of Health of the Republic of Indonesia No. 25 of 2014 defines adolescents as individuals aged 10–18.[1,2] These age ranges are related to the development of the brain's associative cortex, which is vital in decision-making. Reproductive health issues among adolescents generally cover three main aspects: knowledge, attitude, and behavior (KAB). Adolescent populations exhibit distinct reproductive health characteristics and sexually transmitted

infections (STIs). In Indonesia, approximately 80% of adolescents have limited knowledge about general reproductive health topics, such as puberty and menstruation, and fewer than 15% possess moderate knowledge about STIs. Insufficient KAB is related to reproductive health issues and a higher incidence of STIs. For example, many adolescents mistakenly perceive that oral or anal sex is safer than vaginal sex, assuming that no vaginal penetration eliminates the risk of pregnancy and STIs.[1,2] To address these issues, the National Population and Family Planning Board (BKKBN), in collaboration with the Ministry of Education and Culture and with support from the United Nations Population Fund (UNFPA),[3] has released a comprehensive reproductive health module to educate Indonesians on KAB regarding reproductive health.[4,5] However, this module only lightly covers the impacts and prevention of STIs and has not yet included collaboration with health workers or dermatovenereologists.[6]

Early education on reproductive health is essential, yet obstacles remain, particularly in cultural and religious contexts. Many Indonesians view sexual health as a taboo subject,[7] making it uncommon for adolescents to discuss these matters with their parents. Thus, a neutral third party, such as a teacher or friend, is needed to facilitate discussions and education on this topic.[8] Indonesian youths need a specialized and comprehensive module about reproductive health education. A multidisciplinary approach involving educators, parents, and medical professionals is expected to be more effective, especially in respecting ethical, religious, and cultural beliefs.[9] Additionally, providing adolescents with independent access to online reproductive health education, without any adult intervention or restrictions based on sociocultural norms, would be a significant advancement in this area.[10]

Research on online reproductive health education remains limited. Therefore, this study aimed to develop an online reproductive health module focusing on STIs specifically for Indonesian adolescents. The objectives included assessing adolescents' KAB regarding reproductive health and STIs and identifying their educational needs. This research supports the development of youth-focused reproductive health and STI education modules based on the principles of sustainable, independent, comprehensive, and holistic health services.

METHODS

This research was conducted from February to July 2022 using online platforms and tools, including Google Forms and Zoom meetings for surveys, questionnaires, and discussions. All participants provided signed informed consent, affirming their willingness to participate. No exclusion criteria were established to ensure broad eligibility, and participants who failed to complete the questionnaire were considered dropouts. Ethical approval was gained from the Research Ethics Committee of the Faculty of Medicine, Universitas Indonesia (No: KET-118/UN2.F1/ETIK/PPM.00.02/2022).

This study began by conceptualizing and constructing a literature-based module, followed by an online survey to assess adolescents' needs. The research team met with representatives of parents, teachers, and students to establish rapport, outline the research processes, and discuss emerging concepts in reproductive education. Primary data collection involved asking questions related to adolescents' KAB towards reproductive health and STIs, as well as the proposed form and content of online-based modules. Scoring for knowledge and attitude was classified as good (>65), fair (50–65), or poor (<50). The questionnaire was adapted from validated instruments used in a study by Folasayo et al,[11] including the English version of the International AIDS Questionnaire and references from the Center for Disease Control and Prevention.[11,12]

Participants included in this study were adolescent students selected through a multistage sampling strategy from various senior high schools in Jakarta, including public, private, vocational, and Islamic institutions. Cluster sampling was first used to categorize schools by sub-district, followed by simple random sampling within those clusters to choose individual schools. The final sample represented the average student population proportionally. Using Krejcie and Morgan's formula,[13] we calculated a minimum sample of 320 students, representing Islamic senior high schools (5%), vocational high schools (50%), and regular senior high schools (45%). The initial online survey collected data from 327 students and 47 teachers across school types.

Following the survey, we held focus group discussions (FGDs) with key personnel from each selected school, including principals, vice principals, counselors, parents, and teachers involved in

sexual and reproductive health (SRH) education. The FGD sessions used open-ended questions to gather qualitative data on educational needs and preferences through in-depth discussions. Teachers also received additional questionnaires to collect their detailed opinions. The required number for each FGD session was eight participants based on Hallowell and Gambatese's study.[14] To accommodate 10% of potential dropouts or incomplete data, we included 10 participants per group.

After obtaining all suggestions and data, we conducted open discussions with clinical psychologists to further refine the module. Clinical psychologists provided inputs regarding the module's content, key considerations, and the structure of the STI-reproductive health educational platform to be created. The process culminated in a Delphi method discussion with 13 dermatovenereologists from 13 Indonesian institutions. The Delphi method was conducted in two stages using online forms. Stage one involved gathering input regarding the STI module from all participating dermatovenereologists. In stage two, the collected feedback was formulated into statements for re-evaluation and revisions until a 90% consensus was reached.

RESULTS

Student and teacher survey

Online questionnaires collected responses from 327 students and 47 teachers across 22 schools in Jakarta, Indonesia (Table 1). The survey gathered information on the status of sex education in senior high schools and the need for sexual health education among adolescents.

We found that <50% of students and teachers had heard of sex education (Table 2), and only about one-third of students and a quarter of teachers had any exposure to sex education at school, often as a non-compulsory subject. Among students whose schools offered sex education programs, 82 (78.8%) learned from teachers, while 18 (17.3%) learned independently. From the teachers' perspective, only half of the students often asked questions on the topic, with most inquiries coming from male and female students. The questions were typically related to menstrual problems, genital hygiene, attraction to the opposite gender, self-identity, and psychological and physiological changes during adolescence.

To address the need for a suitable module, we explored the necessity and ideal methods for delivering sex education to adolescents. Results indicated that approximately 80% of respondents considered sex education an important topic (Table 3). They suggested introducing sex education in junior high school, starting in the early teenage years. While half of the students preferred online formats, particularly animations, teachers favored book-based methods. More than half of the participants agreed that the modules should be separated according to gender. Additionally, the suggested duration was approximately 15–20 min per session, delivered twice over four sessions or three times over two to three sessions, with a chance for repetition to ensure comprehension.

Students offered some suggestions and inputs regarding the educational content: (1) "Use non-traditional, interactive, and engaging formats, such as animations, stories, comics, or case studies. This would cater to diverse learning preferences, facilitate a better understanding of complex subjects, and

Table 1. Demographic characteristics of survey participants

Demographics	Students, n (%) (N = 327)	Teachers, n (%) (N = 47)
Gender		
Male	128 (39.1)	14 (29.8)
Female	199 (60.9)	33 (70.2)
Age (years)		
15	31 (9.5)	-
16	123 (37.6)	-
17	139 (42.5)	-
≥18	34 (10.4)	-
20–29	-	12 (25.5)
30–39	-	11 (23.4)
>40	-	24 (51.1)
School type		
Regular high school	209 (63.9)	29 (61.7)
Vocational high school	77 (23.5)	10 (21.3)
Islamic high school	41 (12.5)	8 (17.0)
School affiliations		
Governmental	178 (54.4)	21 (44.7)
Private	149 (45.6)	26 (55.3)
Grade		
1st year	83 (25.4)	-
2nd year	208 (63.6)	-
3rd year	36 (11.0)	-

be more appealing to students;" (2) "Educational materials should use clear, straightforward language to effectively convey explicit messages, allowing learners to understand complex concepts more readily;" (3) "Materials should provide information objectively and with a neutral tone. This would ensure a comfortable learning environment for youths, encourage open discussions, and facilitate learning without judgment;" (4) "Resources should clarify the long-term implications and reasoning in every information presented, rather than merely focusing on memorization. This would lead to a more meaningful understanding of the significance and benefits of sexual health education;" (5) "Resources should be accessible online at any time and cost-effective. They should also ensure brevity and clarity while allowing face-to-face guidance from teachers or healthcare professionals."

Table 2. Perceptions and practices of sexual health education from student and teacher

Questions	Students, n (%) (N = 327)	Teachers, n (%) (N = 47)
Have you ever heard about sexual health education?		
Yes	158 (48.3)	23 (48.9)
No	93 (28.4)	13 (27.7)
Maybe	76 (23.2)	11 (23.4)
Does sexual health education become a compulsory subject at your school?		
Yes	104 (31.8)	12 (25.5)
No	223 (68.2)	35 (74.5)
For them who have sexual health education at school, how is it delivered?		
Being taught by teacher	82 (78.8)	9 (75.0)
Self-learning	18 (17.3)	2 (16.7)
Seminar	4 (3.8)	1 (8.3)
How often does a student ask about sexual & reproductive health?		
Always	-	0 (0)
Often	-	24 (51.1)
Sometimes	-	3 (6.4)
Rarely	-	3 (6.4)
Never	-	17 (36.2)
For those who ask, which gender of student does frequently ask about it?		
Female	-	13 (43.3)
Male	-	5 (16.7)
Both	-	12 (40.0)

A further KAB survey collected responses from 129 students, with 73 (56.6%) and 84 (65.1%) students scoring above 65 for good knowledge and attitude, respectively. However, 32 students (24.8%) were found to be at risk of STIs. The results are detailed in Table 4.

Teacher survey and teacher-parent FGD

We examined feedback from 47 participants, including teachers and parents from 22 schools in Jakarta, collected during FDGs on March 2, 2022. Key suggestions and feedback included: (1) "Educational materials should be captivating and practically applicable, incorporating the latest scientific research and reliable sources to connect theory with real-life applications;" (2) "The language used in discussions should be accessible yet appropriately formal, avoiding overly complex or casual expressions. Each session should end with a moral takeaway for clarity, relevance, and ethical guidance;" (3) "Incorporate evaluations, such as worksheets and active participation from healthcare professionals, to reinforce interactivity, provide assessment opportunities, and facilitate understanding;" (4) "The framework should prioritize cognitive development, cultivate proper attitudes and behaviors, and emphasize the family's role to ensure a holistic approach to personal character development;" (5) "The reproductive health module must address the importance of values and societal norms, respectfully reflecting Indonesia's diverse religious perspective and honoring the cultural and religious fabric of Eastern societies."

Open discussions with clinical psychologists

We held open discussions with 10 clinical psychologists with 2–10 years of clinical experience, on April 4 and 16, 2022, focusing on various topics and module preparations for reproductive health and STI education tailored for adolescents. Key discussion points included: (1) "Initial modules should encourage self-discovery and help establish a firm identity aligned with societal norms, beginning with physiological and psychological changes of puberty, sexual identity, and social responsibilities;" (2) "Risky or harmful adolescent behaviors should be addressed by providing positive and constructive alternatives, such as encouraging physical activity to reduce screen time or channeling emotional energy into creative pursuits like dancing or playing a musical instrument;" (3) "Raising youth awareness about

Table 3. Survey responses from students and teachers on sexual health education preferences and effectiveness

Questions	Groups	
	Students, n (%) (N = 327)	Teachers, n (%) (N = 47)
How important is sexual health education?		
Very important	171 (52.3)	35 (74.5)
Quite important	93 (28.4)	8 (17.0)
Neutral	55 (16.8)	4 (8.5)
Quite unimportant	5 (1.5)	0 (0)
Unimportant	3 (0.92)	0 (0)
What is the best time to introduce sexual health education?		
Senior high school (16–19 years)	114 (34.9)	12 (25.5)
Junior high school (13–15 years)	171 (52.3)	23 (48.9)
Elementary school (6–12 years)	42 (12.8)	12 (25.5)
What is the most suitable delivery method for sexual health education?		
Online-based (animation)	170 (52.0)	15 (31.9)
Book-based	102 (31.2)	19 (40.4)
Talk-show/seminar	54 (16.5)	8 (17.0)
Both (animation & book)	1 (0.31)	5 (10.6)
Do you think using online-based module will be useful and suitable?		
Yes	161 (49.2)	21 (44.7)
No	146 (44.6)	11 (23.4)
Maybe	13 (4.0)	14 (29.8)
No idea	7 (2.1)	1 (2.1)
Is it effective to give sexual health education separately for each gender?		
Yes	201 (61.5)	27 (57.4)
No	104 (31.8)	20 (42.6)
Maybe	22 (6.8)	0 (0)
How long is the effective duration for each session?		
10 min	42 (12.8)	-
15 min	87 (26.6)	-
20 min	100 (30.6)	-
25 min	35 (10.7)	-
30 min	55 (16.8)	-
No idea	8 (2.5)	-
How many times and session ideal for an effective sexual health module?		
1 x 8 sessions	30 (9.2)	-
2 x 4 sessions	128 (39.1)	-
3 x 2–3 sessions	112 (34.3)	-
4 x 2 sessions	46 (14.1)	-
8 x 1 session	11 (3.4)	-
Should every session be repeated to increase the comprehension?		
Yes	201 (61.5)	-
No	60 (18.3)	-
Maybe	66 (20.2)	-

Table 4. Adolescents' KAB on sexual health

Components	n (%) (N = 129)
Knowledge, mean (SD); median (min–max)	65.97 (11.16); 65.52 (34.48–96.55)
Good	73 (56.6)
Fair	47 (36.4)
Poor	9 (7.0)
Attitude, mean (SD); median (min–max)	68.68 (23.33); 72.00 (0–100)
Good	84 (65.1)
Fair	22 (17.1)
Poor	23 (17.8)
Behavior*	
Did sexual intercourse	3 (2.3)
Have sex with commercial sex worker	1 (0.8)
Did not abstain from sexual intercourse	19 (15.5)
Using oral or inhaled drugs	2 (1.6)
Consuming alcohol	1 (0.8)
Smoking tobacco	8 (6.2)
Watching pornography	13 (12.4)
High risk of contracting STI†	32 (24.8)

KAB=knowledge, attitude, and behavior; SD=standard deviation; STI=sexually transmitted infection
*Surveyed on characteristics of risky behavior related to STI; †those who are sexually active and/or watch pornography

the implications of promiscuity and diverse sexual orientations, emphasizing that present actions can significantly influence future health, social status, and employment opportunities;" (4) "STI education should be systematically delivered through case studies relatable to high school students' lifestyles and demographics, ensuring cultural relevance and mental preparedness;" (5) "Educational contents should be student-centric and free from discrimination or judgment when addressing sensitive topics. This approach strengthens self-esteem, promotes self-awareness, and encourages prudent behavior in alignment with cultural norms and values."

Delphi discussion with dermatovenereologists

The Delphi discussion was conducted in two stages from July 17 to 28, 2022, with 13 participants from the Postgraduate Dermatology and Venereology Specialist Education and Training Program, Faculty of Medicine, Universitas of Indonesia (*Institusi Pendidikan Dokter Spesialis-Dermatologi Venereologi Indonesia*). Most of the prepared topics received approval with various revisions, achieving up to 90% agreement. Several additional points emerged: (1) "Educational materials for early adolescents should prioritize explaining anatomical and physiological changes during puberty. An in-depth understanding of these changes is essential for building a strong personal identity, self-esteem, and character in young individuals;" (2) "The term 'risky sexual orientation and behavior' will be used in the module to describe behaviors that may pose health risks, ensuring the language remains non-discriminatory and the content is presented without prejudice;" (3) "Discussions on sexuality within the modules should align with societal norms, avoiding content that could lead to misconceptions or conflict with cultural perspectives. Personal growth and fulfillment topics were considered beyond the module's scope and were excluded;" (4) "Teaching the iceberg phenomenon concept on STIs is important, illustrating their broad impact that surpasses immediate physical symptoms and includes potential long-term mental health disorders;" (5) "Health facilities should actively reduce societal stigma and educate students. We advocate enhanced utilization of school health clinics to provide the necessary education and consultation services on reproductive health and STIs."

The results of these processes were summarized into a content concept and module design, which was refined using the Delphi method to achieve 90% agreement. The final module design incorporated multimedia elements, clear and simple language, non-judgmental tone, comprehensive explanations of STIs and their long-term impacts, and continuous access to concise and cost-effective educational resources. The final module is currently in close-access mode which is still being processed for the copyright and its legality and permission from the Ministry of Education.

DISCUSSION

The Joint United Nations Programme on HIV/AIDS has reported that 550,000 people in Indonesia are living with HIV, consisting of 340,000 males and 210,000 females.[15] Among these individuals, 19,000 are children aged 0–14, and 13,000 are adolescents aged 10–19. The prevalence of STIs remains a significant public health concern, with 6,728 cases reported from clinical sources and 13,295 from laboratory

diagnoses.[16] The primary factor contributing to this issue is insufficient awareness and education about sexual health. This study involving 327 students and 47 teachers and parents from 22 public and private schools in Jakarta revealed that fewer than 50% had heard about sex education. The non-mandatory status of sex education in most schools exacerbates this lack of awareness. Although 80% of our respondents acknowledged the importance of sex education, their preferences for delivery methods differed: students favored online modules, while teachers preferred book-based resources. Additionally, students suggested using animations, stories, comics, or case studies to enhance their understanding, accessibility, affordability, and conciseness under the guidance of teachers or healthcare professionals. These findings emphasize the need for widespread and mandatory sex education programs tailored to the unique concerns and preferences of both students and teachers to effectively combat the spread of HIV and other STIs.

The survey also indicated that 56.6% of the adolescents demonstrated good knowledge of sexual health, though comprehension varied widely. While 65.1% displayed a positive attitude, their behaviors varied: 2.3% reported having had sexual intercourse, 0.8% had engaged with commercial sex workers, and 15.5% did not abstain from sexual activities. Alarmingly, 24.8% were identified as being at risk for STIs, indicating the need for targeted interventions to address these gaps and promote adolescent well-being. These results align with statistics reported by the Ministry of Health of the Republic of Indonesia regarding reproductive health and STI issues among adolescents, indicating that 5–10.4% of sexual intercourse cases occur at ages 15–19, and 52.5% of HIV/STI cases are diagnosed before age 30.[7] Moreover, many STI cases remain concealed due to insufficient KAB regarding sex education, which is often associated with high-risk activities. Addressing these gaps is crucial to enhancing the sexual health and well-being of adolescents in Indonesia.

The importance of comprehensive sexuality education (CSE) aligns significantly with a reduced risk of teen pregnancy compared to no sex education or abstinence-only programs.[17] Research indicates that in CSE,[18,19] abstinence is included in the curriculum, but it is not emphasized as the primary focus. Instead, CSE emphasizes a range of prevention strategies, including contraception and increasing awareness to prevent STIs and unwanted pregnancies while promoting safe sexual practices. CSE is an empowerment-based approach rooted in values and practices that emphasize human rights, gender equality, participatory learning, youth advocacy, civic engagement, and cultural appropriateness. The UNFPA reported that CSE does not lead to earlier sexual activity or risky sexual behaviors, disproving traditional misconceptions.[19] Approximately two-thirds of CSE programs demonstrated reductions in risky sexual behaviors, with 60% yielding positive effects, such as increased condom use and reduced teenage pregnancies.

Our survey revealed valuable insights from teachers on enhancing sex education, highlighting the urgent need for improved programs in today's digital age, where misinformation, myths, and stigmas surrounding adolescent sexuality are prevalent. The insights, drawn from different school backgrounds, reflect diverse cultural and religious perspectives, highlighting the challenges in navigating this complex landscape. The digital era not only overwhelms individuals with information but also intensifies concerns about misinformation about sexual health. Teachers and parents emphasized the importance of creating content that transcends theory and includes practical applications while aligning with cultural and religious values.

In many Eastern cultures, the deep-rooted perception of sex as a taboo complicates the implementation of CSE because of the fear of encouraging promiscuity among youths.[18,19] These challenges extend beyond the classroom, as traditional values in some East Asian families limit discussions about sexual behaviors. One study reported that 77% of parents have never spoken to their children about sex because of traditional Chinese values.[20] Parents in Hong Kong often lack the confidence and knowledge to engage in sex-related discussions with their children, highlighting the need for targeted programs to empower them and close the knowledge gap. The lack of family-based sex education further highlights the need for comprehensive initiatives that equip parents with the necessary knowledge, attitudes, and communication skills on these topics. These challenges emphasize the critical importance of culturally sensitive and comprehensive approaches, as sociodemographic characteristics can significantly affect how people perceive sex education. Addressing misinformation and fostering a holistic understanding of sexual health in the Eastern region is essential,

considering educational disparities, particularly among disadvantaged youth.

Insights from open discussions with clinical psychologists highlight the importance of a nuanced and psychologically sensitive approach to reproductive health education for adolescents. Recommendations include fostering self-discovery, discussing both physical and mental changes during puberty, and addressing issues related to promiscuity and sexual orientation. Dermatovenereologists, through the Delphi method, highlighted the significance of explaining physical changes during adolescence, advocating for the use of non-judgmental terminology and incorporating the concept of the iceberg phenomenon. Collectively, these perspectives provide a comprehensive roadmap for developing culturally sensitive and effective reproductive health and STI education modules in Indonesia.

A study that categorized CSE content into four domains revealed its effectiveness[21] and positive outcomes. Category A content focused on educating children and adolescents about their sexual rights, including sexuality, sex-related health, and respecting others' rights, showed significant positive outcomes. Similarly, category D demonstrated effectiveness in promoting positive sexuality and respectful relationships. However, the study noted that CSE content is fragmented, indicating the need for a systematic and comprehensive training program. United Nations Educational, Scientific and Cultural Organization emphasizes the importance of CSE for healthy and safe social and sexual relationships, supported by statistical evidence of its effectiveness in enhancing cognition, knowledge, intention, and self-efficacy.[22] These findings highlight CSE's contribution to enhancing adolescents' quality of life and sexual health and emphasize the need for policymakers, educators, parents, and health experts to recognize and prioritize the implementation of CSE.

The development of an online reproductive health module focused on STIs for Indonesian adolescents has several benefits. By providing comprehensive knowledge, the module enables adolescents to make informed decisions, foster healthier behaviors, and reduce the risk of STIs and unwanted pregnancies. A study involving 138 ninth-grade classrooms from 69 public schools across 21 cities in urban Colombia demonstrated the effectiveness of online sexual education modules, showing a notable 0.38 standard deviation increase in overall sexual health knowledge among participants 6 months after the intervention.[23] A comparable study in China assessed the efficacy of an online sex education module in enhancing SRH knowledge and attitudes among tenth-grade vocational high school students. The results indicated significant improvements in SRH knowledge scores for both genders, with the intervention group showing more progressive attitudes towards SRH than the control group.[24]

Online modules provide the advantage of accessibility anytime and anywhere through an internet connection, which is essential for reaching Indonesian adolescents, especially those in remote areas with limited access to healthcare and education. They also offer scalability, enabling the simultaneous dissemination of STI information to a broad audience, which is particularly significant in populous countries such as Indonesia. A culturally tailored online program called "Native IYG," designed to deliver HIV, STIs, and pregnancy prevention education to tribal middle schools in Alaska, Arizona, and the Pacific Northwest, demonstrated significant positive impacts and efficacy in a randomized controlled trial for high-risk youth. The program enhanced knowledge about HIV and STIs, improved self-efficacy regarding condom use and availability, and strengthened reasons for abstaining from sex.[25]

One limitation of this study is the potential influence of cultural norms and values on participants' responses to sex education. Participants might lean towards selecting answers that align with socially accepted views, introducing bias and potentially skewing the KAB survey results. In conclusion, there is a clear need for an interactive, comprehensive, accessible, and culturally sensitive online-based youth reproductive health and STI module in Indonesia. Such a module should reinforce adolescents' self-concept while aligning with societal values and cultural norms. Overall, adolescents from various schools in Jakarta positively accepted the presented sex education module, effectively meeting their needs. These insights provide a blueprint for the development of a practical educational module for youth reproductive health and STI prevention.

Conflict of Interest

The authors affirm no conflict of interest in this study.

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