

Edutainment as a Preventive Tool for Adolescent Risk Behavior: A Systematic Analysis of HIV/AIDS Education Strategies

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ABSTRACT

Background: Adolescent engagement in risky sexual behaviors, such as early sexual initiation, presents a pressing global public health concern that impacts adolescents' physical and mental health and may influence their prospects. These behaviors increase risks of HIV/AIDS, other sexually transmitted infections, and unintended pregnancies, which can limit opportunities and affect life trajectories. According to the World Health Organization (WHO), adolescents represent around 20% of the global population, with the majority living in developing nations where resources for education and prevention are often limited. Data from Indonesia's National Population and Family Planning Board (BKKBN) highlights this challenge, with 60% of adolescents aged 16-17, 20% aged 14-15, and 20% aged 19-20 reporting sexual activity. **Objectives:** This systematic review investigates the effectiveness of edutainment—a strategy combining education with entertainment—in reducing risky sexual behaviors among adolescents by preventing HIV/AIDS and promoting informed decision-making. **Methods:** Literature from 2014-2024 was gathered using Proquest, Google Scholar, PubMed, Elsevier, and Web of Science, with keywords including "edutainment," "prevention of casual sex," "adolescent sex education," and "sex education programs. **Results:** Findings indicate that edutainment approaches—utilizing interactive play and educational activities—effectively enhance adolescent and parental awareness of the risks associated with free sex and strengthen adolescent skills in self-protection and resisting inappropriate advances. **Conclusion:** The edutainment-based intervention model is a promising strategy for preventing risky sexual behaviors among adolescents, promoting health-conscious decision-making, and fostering protective skills.

Keywords: Adolescent, Edutainment, Free sex, HIV/AIDS, Sex education

INTRODUCTION

The third goal of the Sustainable Development Goals (SDGs) focuses on health and well-being, ensuring healthy lives and promoting well-being for all ages (United Nations, 2015). Therefore, ensuring adolescents have access to adequate reproductive health information and services is crucial. Thorough sexual education can help adolescents understand the risks of unsafe sexual behavior, such as promiscuous sex. The current phenomenon of promiscuous sex among adolescents is important to note. Sexual activity outside of marriage is now increasingly common among adolescents and adults, including in Indonesia. According to the National Population and

Family Planning Agency (Badan Pusat Statistik (BPS), 2017), the rate of sexual intercourse outside marriage is increasing among adolescents aged 15 to 19 years. The incidence rate is 59% among females aged 15 to 19 and 74% among males. B.K.K.B.N. states that although the rate of early marriage is declining, the trend of sexual relations among teenagers is increasing. Free sex is starting to be considered "usual and commonplace" among urban communities due to an increasingly open lifestyle, so the behavior of today's teenagers is no longer a surprise to society (Shabrina et al., 2023). This condition raises various questions regarding the impact of casual sex on adolescents' health, social relationships, and mental development.

The World Health Organization (2018) states that in 2018, the worldwide adolescent population reached 1.5 billion, indicating that one in five people in the world is between 10 and 24 years old. The results of the 2017 Indonesian Health Demographic Survey stated that out of 23,770 adolescents aged 15-24 years had had premarital sex as much as 7.7%. The causes of free sex include sex education on premarital sex, including lack of knowledge about sex education, which causes adolescents to engage in premarital sexual behaviour, imperfect socialization, misunderstanding of the concept of sex education in the context of premarital sex, intense curiosity, and the views of some people who consider taboo the concept of sex education (Sejati & Mufida, 2021). Research conducted by (Syafitriani *et al.*, 2022) shows that dating increases the risk of premarital sexual behaviour up to 20 times.

Health Promotion and Behavioral Science plays a critical role in designing and implementing mental health promotion strategies and addressing the mental health challenges faced by adolescents and young people. Health promotion and behavioural science education provide insight into the cognitive, social, and environmental factors influencing mental health behaviours. By understanding these factors, interventions can be tailored to change behaviour and improve mental health effectively. One form of effective health promotion and behavioural science education is edutainment (Patel *et al.*, 2016). Free sex and HIV/AIDS can be prevented by various methods, one of which is by using edutainment. Edutainment has the potential to influence adolescents' attitudes and behaviours related to casual sex. Programs that use game elements, videos, or engaging stories can help convey important messages about empathy, tolerance, and the negative impacts of casual sex in a way that is easier to understand. Edutainment is defined as a theory-based communication strategy to intentionally insert educational and social issues in the process of creating, producing, processing, and disseminating entertainment programs, to achieve desired changes in individuals, communities, institutions, and society

among the intended population of media users (Wang, 2009)

The results of previous research by Orozco-Olvera *et al.*, (2019) stated that narrative edutainment had a small but significant effect on three sexual behaviours, namely reducing the number of sexual partners, reducing unprotected sex, and improving the management of sexually transmitted infections. Edutainment is usually also found in media such as web series, movies, and Netflix services, providing teaching on themes such as HIV, family planning, pregnancy and child health, violence against women, and other topics. As a result, research has found that entertainment education influences young couples' choices about sex in their relationships (Gambhir & Panwar, 2024). Excellent and comprehensive sex education can help adolescents understand the risks and consequences of sexual behaviour, potentially reducing the incidence of casual sex among them.

Based on the problems that have been described, the purpose of this study is to conduct an in-depth study of the effectiveness of edutainment as an effort to prevent free sex among adolescents. It is expected that the results of this literature review can be a reference in further efforts to prevent the phenomenon of free sex among adolescents.

METHODS

After determining the research objectives, the authors conducted a literature review by searching for data from related articles in databases such as Google Scholar, PubMed, ProQuest, ScienceDirect, and Web of Scopus. The literature search used boolean operation with the keywords used were ("Education" OR "Play" OR "Game" OR "Technology") AND ("Prevent*") AND ("Sexual*" OR "Sex Education" OR "Reproductive Health" OR "Sexual Health" OR "Sexual Behavior" OR "Free Sex") AND ("Teenager*" OR "Youth" OR "Adolescent" OR "Students").

Papers that fit the criteria of this study regarding the effectiveness of edutainment as a prevention measure for promiscuous sex and HIV/AIDS among adolescents should be articles published within the last 10 years. The selected articles should discuss prevention efforts

made by various schools or researchers in relation to the prevention of free sex and HIV/AIDS in adolescents. The efforts made can be in the form of edutainment conducted for adolescents aged 10-19 years. The following factors were used to ensure that only high-quality and relevant research was selected. Articles that fit the criteria must also be in English. This may mean that languages other than English are excluded.

A systematic review was used to obtain the data. From each selected article, relevant information was extracted, such as study characteristics, methods, sample size, details about the edutainment methods used, and conclusions. The data collection process aimed to provide a comprehensive picture of the various edutainment programs implemented in efforts to prevent promiscuous sex and HIV/AIDS

among adolescents. Four reviewers assessed the scientific quality of each study separately. Any disagreement in assessing quality was resolved by discussing it and reaching an agreement. This review only looked at moderate to high-quality studies. A detailed method was used to look at the data. A summary of free sex and HIV/AIDS prevention efforts conducted through edutainment was made from the selected studies. The study mainly looked at essential things such as edutainment methods, results achieved, suggestions, recommendations, and policy implications for the prevention of promiscuous sex and HIV/AIDS in adolescents. This study did not include literature review articles and focused on articles that had articles that have results of prevention efforts that have been carried out.

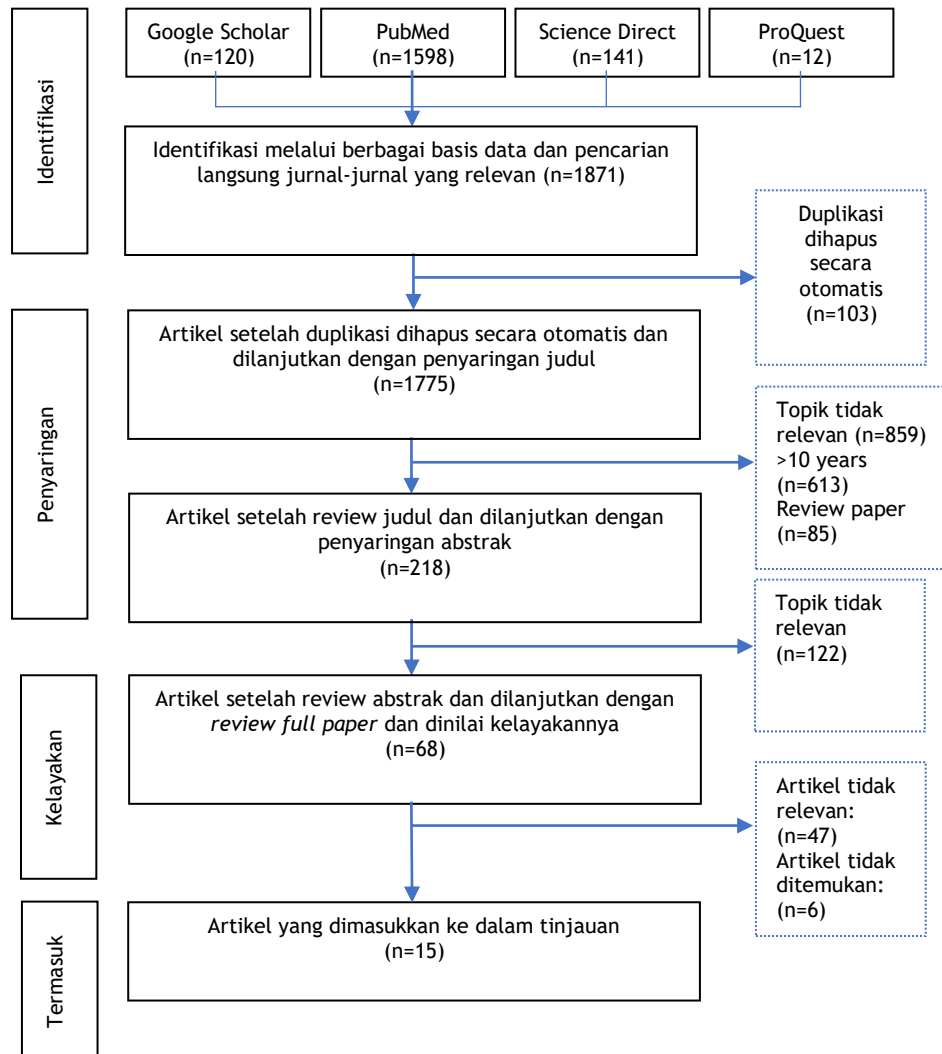


Figure 1. Study Selection Flow Chart

RESULTS AND DISCUSSION

The findings of this study clearly show that there are several edutainment methods in an effort to prevent free sex and HIV/AIDS-related education for adolescents. The study selection resulted in 15 articles that met the study criteria. The selected articles can be seen in Table 1. This study reviewed various edutainment-based interventions aimed at preventing promiscuous sex and HIV/AIDS in adolescents. Edutainment is a communication strategy to influence attitudes and behaviours through the use of media (Aswadi *et al.*, 2022). The studies analyzed used a variety of research designs, including randomized controlled trials, quasi-experimental designs, and participatory approaches. Interventions applied included smartphone games, web-based games, simulations, and computer-based sexual health education programs.

This research shows that edutainment, through the use of smartphone, web and computer-based games, has significant potential in the prevention of promiscuous sex and HIV/AIDS among adolescents. One example is the smartphone game "Tumaini", which was shown to be effective in improving sexual health knowledge and risk-avoidance skills among adolescents in Africa. Children are highly motivated to play, making learning more engaging than traditional methods. In addition, the game also helps them set personal goals and plan for the future, which encourages them to avoid risky behaviours (Winskell *et al.*, 2018). In addition to smartphone games, there are also web-based games such as "The Secret of Seven Stones" (SSS), which is designed to improve communication between parents and teenagers. The game is designed to prevent unintended pregnancies and sexually transmitted infections (STIs) among adolescents by providing notification features for parents as well as providing skills training for them. Test results showed that the game was easy to use at home and had positive ratings (Shegog *et al.*, 2021). Furthermore, a prototype game, "Campus Craft", was developed to prevent sexual violence on campus. The results showed that after playing the game, participants experienced an increased understanding

of the concept of sexual consent and a decrease in attitudes that support rape. Participants also gave positive ratings to aspects of the game, confirming that the game-based approach was exciting and engaging (Jozkowski & Ekbia, 2015).

The study also compared the effectiveness of a web-based HIV prevention intervention (TES) with an educator-delivered intervention. Both groups showed significant improvements in knowledge of HIV, hepatitis, and STIs, as well as in condom use skills. While there was no significant change in the frequency of unprotected sexual activity, participants in the TES group reported that the materials were more accessible to understand compared to the educator-delivered intervention. The HIV/STI prevention program "It's Your Game: Keep It Real" (YIG) program implemented in a junior high school in Los Angeles showed that students who participated in the program were less likely to initiate sexual activity than those who did not. The program was successful in increasing students' knowledge about HIV/STIs and changing their attitudes towards sex and condom use. However, more recent programs such as It is Your Game-Tech (YIG-Tech) did not show significant differences in sexual behaviour, although participants showed increased knowledge about STIs and condoms (Peskin *et al.*, 2019).

Gamified instruction and gamification-based interventions were found to be more effective than traditional teaching methods in improving sexual health knowledge among adolescents. Both methods increase students' motivation, positive attitude, and participation in learning, making them more aware of the importance of healthy sexual practices. Research conducted by (Muthmainnah *et al.*, 2021) in Indonesia shows that there is a difference in the level of reproductive health knowledge between students in public schools and faith-based schools, where students in public schools have better knowledge. Although students' attitudes towards reproductive health programs are overall positive, environmental factors and influence from others greatly affect their attitudes. The use of electronic media, such as the mobile application "Remaja Sehat", is proven to be more effective than printed

modules in improving adolescents' knowledge and self-efficacy related to sexual and reproductive health.

The Native It's Your Game (Native IYG) curriculum also shows significant potential in HIV/STI and pregnancy prevention among American Indian/Alaska Native (AI/AN) adolescents. Preliminary results show that adolescents gave high ratings to usability parameters and felt that these lessons helped them make better health choices. However, while these results are promising, further

research is needed to test the long-term effectiveness of all the programs mentioned. Overall, the use of digital technology and game-based approaches in sexual health education shows great potential to prevent risky sexual behavior and the spread of HIV/AIDS among adolescents. This study emphasizes the importance of collaboration between game designers, sexual health experts, and behavior change experts to develop effective games (Shegog et al., 2017).

Table 1. Summary of Finding from 15 studies.

No	Title	Study Design, Sample, and Variables	Intervention	Research Finding	Recommendation
1.	<i>A smartphone game to prevent HIV among young Kenyans: local perceptions of mechanisms of effect (Winskell et al., 2018)</i>	A randomized pilot trial, 60 participants aged 11-14 in Western Kenya. Independent: Use of the 'Tumaini' game. Dependent: Sexual health-related knowledge, self-efficacy, behavioral intentions, and risk communication.	Game: "Tumaini" is an interactive, narrative-based smartphone game designed to prevent HIV by increasing age and condom use at first sex among young African adolescents.	The game showed promising effects on behavioral mediators of sexual debut, with significant gains in sexual health-related knowledge, self-efficacy, and behavioral intentions.	The study suggests that interactive mobile technologies like "Tumaini" can effectively engage youth in culturally relevant HIV prevention interventions, promoting safer sexual behaviors and long-term health outcomes.
2.	<i>A Web-Based Game for Young Adolescents to Improve Parental Communication and Prevent Unintended Pregnancy and Sexually Transmitted Infections (The Secret of Seven Stones): Development and Feasibility Study (Shegog et al., 2021)</i>	Intervention mapping (IM) approach to develop a web-based game, included parents and young adolescents (aged 11-14 years). Independent: Participation in the game. Dependent: Sexual health communication, skills, and behaviors.	Game: The intervention was a web-based game called "The Secret of Seven Stones" (SSS), designed to facilitate sexual health skills training and parent-child communication.	The game demonstrated feasibility for in-home use and received positive usability ratings from participants.	The study recommends using intergenerational games as a strategy to enhance parental involvement and reduce adolescent sexual risk behaviors.
3.	<i>"Campus Craft": A Game for Sexual Assault Prevention in Universities (Jozkowski & Ekbia, 2015)</i>	Participatory design process involving students, educators, and experts. Sample: 141 college students. Variables: Usability, game mechanics,	Game: "Campus Craft," a simulation game addressing sexual assault prevention through interactive scenarios and learning objectives.	Participants rated the game positively. and Improved understanding of sexual consent and rape culture.	Computer-based gaming is a promising approach for sexual assault prevention education. And needed to corroborate findings and explore feasibility

No	Title	Study Design, Sample, and Variables	Intervention	Research Finding	Recommendation
		attitudes, and learning outcomes			with larger samples.
4.	<i>Comparative Effectiveness of Web-Based vs. Educator-Delivered HIV Prevention for Adolescent Substance Users: A Randomized, Controlled Trial</i> (Marsch <i>et al.</i> , 2015)	Randomized, controlled trial, adolescents (ages 12-18) in outpatient substance abuse treatment in New York City. Independent: Type of intervention (web-based TES vs. educator-delivered). Dependent: HIV/disease-related knowledge, intentions to engage in safer sex, sex-related risk behavior, self-efficacy to use condoms, and condom use skills.	Web-Based Intervention: Therapeutic Education System (TES) with 26 modules on HIV, hepatitis, and STI prevention. Educator-Delivered Intervention by small group sessions with a trained prevention specialist.	Interventions were effective in increasing HIV-related knowledge, condom use self-efficacy, and reducing HIV risk behaviors. Participants found the web-based TES easier to understand.	Web-based interventions like TES can effectively replace traditional methods, offering a scalable, cost-effective solution for HIV prevention in youth substance abuse treatment programs.
5.	<i>Effectiveness Evaluation of It's Your Game: Keep It Real, a Middle School HIV/Sexually Transmitted Infection/Pregnancy Prevention Program</i> (Rohrbach <i>et al.</i> , 2019a)	Quasi-experimental design, ninth-grade students from 24 urban middle schools in Los Angeles County. Independent: Participation in the IYG program. Dependent: Initiation of sexual activity, presexual behaviors, and psychosocial mediators.	Role plays, group discussions, and computer-based activities: "It's Your Game: Keep It Real" (IYG), a 24-lesson HIV/STI/teen pregnancy prevention curriculum. Implemented by trained classroom teachers over two years (seventh and eighth grades).	Behavioral Outcomes: IYG group showed lower initiation of sexual activity and presexual behaviors. Psychosocial Outcomes: Improved knowledge, beliefs about abstinence, and self-efficacy among IYG students.	Suggests broader dissemination and additional replications of the IYG program in urban public schools.
6.	<i>Efficacy of It's Your Game-Tech: A Computer-Based Sexual Health Education Program for Middle School Youth</i> (Rohrbach <i>et al.</i> , 2019b)	Randomized, two-arm nested design, 1,374 eighth-grade students from 19 schools in southeast Texas. Independent: Participation in IYG-Tech. Dependent: Delay in sexual initiation, sexual	Computer-based sexual health education program: IYG-Tech a 13-lesson, computer-based sexual health education program	No significant difference in delaying sexual initiation between intervention and control groups. Positive impacts on psychosocial factors like STI and condom knowledge, attitudes about abstinence, and	Further evaluation needed with full intervention exposure to determine efficacy in changing sexual behavior.

No	Title	Study Design, Sample, and Variables	Intervention	Research Finding	Recommendation
		behaviors, and psychosocial factors.		condom use self-efficacy.	
7.	<i>Gamifying Sexual Education for Adolescents in a Low-Tech Setting: Quasi-Experimental Design Study (Haruna et al., 2021)</i>	A quasi-experimental design, 120 secondary school students aged 11-15. Independent: Teaching methods (serious games, gamification, traditional teaching). Dependent: Sexual health knowledge, motivation, attitude, and engagement.	Games: The interventions included serious games (SG) and gamification (GM) approaches, compared to traditional teaching methods. The SG group used a game called "My Future Begins Today," while the GM group used game-like elements in learning activities.	The SG and GM approaches were significantly more effective than traditional methods. Students in the SG and GM groups showed higher posttest scores, increased motivation, better attitudes, and greater engagement in learning.	The study recommends using digital health technologies, particularly gamified instruction and serious games, to improve sexual health education. These methods are effective in increasing knowledge and engagement among adolescents, especially in low-tech settings.
8.	<i>Implementation of adolescent health programs at public schools and religion-based schools in Indonesia (Muthmainnah et al., 2021)</i>	An analytic observational quantitative study using a cross-sectional design, 100 students selected through simple random sampling. Independent: Type of school (public vs. religion-based). Dependent: Knowledge and attitudes about adolescent reproductive health.	YCHS Programs: The intervention involves the implementation of Youth Care Health Services (YCHS) in schools, focusing on providing quality adolescent health services and increasing knowledge and prevention of various adolescent health issues.	There are differences in knowledge and attitudes about adolescent reproductive health between public and religion-based schools. Public school students generally have better knowledge and more positive attitudes towards reproductive health.	The study recommends regular monitoring and evaluation of standardized adolescent health programs in all types of schools to ensure equal access to health information and services for all adolescents.
9.	<i>Improving Sexual Health Education Programs for Adolescent Students through Game-Based Learning and Gamification (Haruna et al., 2018)</i>	Randomized controlled trial, 120 secondary school students in Dar es Salaam, Tanzania. Independent: Teaching methods (game-based learning, gamification, traditional teaching). Dependent: Motivation, Attitude,	GBL: Digital games designed for sexual health education. Use of game mechanics like points, badges, and leaderboards in a non-game context.	GBL and gamification groups scored significantly higher in post-tests compared to traditional teaching. Both methods improved motivation, attitude, knowledge, and engagement.	Implement GBL and gamification in sexual health education to enhance learning outcomes. Tailor content to fit the socio-cultural context of the target population.

No	Title	Study Design, Sample, and Variables	Intervention	Research Finding	Recommendation
		Knowledge, and Engagement (MAKE framework).			
10.	<i>NATIVE-It's Your Game: Adapting a Technology-Based Sexual Health Curriculum for American Indian and Alaska Native youth (Shegog et al., 2017)</i>	A systematic instructional design approach called Mapping, middle school youth from various regions. Independent: The adapted curriculum "Native It's Your Game." Dependent: Usability, cultural appropriateness, and perceived impact on health choices.	Curriculum: 13-lesson Internet-based curriculum adapted from "It's Your Game-Tech" to be culturally relevant for AI/AN youth. It includes interactive activities, videos, and fact sheets.	The adapted curriculum was rated highly by youth and stakeholders for usability, cultural appropriateness, and helpfulness in making better health choices.	Further efficacy testing is recommended to confirm the curriculum's effectiveness in delivering HIV/STI and pregnancy prevention education to AI/AN middle school youth
11.	<i>School-Based Interactive Reproductive Health Education to Improve Adolescent Understanding of HIV/AIDS (Priwardani et al., 2023)</i>	Pre-experimental one-group pre-post design, 44 adolescents from MTs 2 Jember, aged 14-15 years. Independent: Interactive reproductive health education. Dependent: Adolescents' understanding of HIV/AIDS56.	Interactive Education: Conducted by KOMPLIDS, involving pre-tests, interactive sessions, and post-tests to educate about HIV/AIDS.	Significant improvement in adolescents' understanding of HIV/AIDS post-intervention, with a statistical significance value of 0.0005.	Continued and school-supported interactive reproductive health education to sustain and enhance adolescents' understanding of HIV/AIDS.
12.	<i>Serious Games for Sexual Health (Shegog et al., 2015)</i>	A roundtable discussion involving experts in sexual health and serious games. Independent: serious games. Dependent: sexual health behaviors and outcomes.	Games: Serious games designed to educate and influence sexual health behaviors among adolescents. These games are interactive and tailored to be engaging for young people.	Serious games are found to be more engaging for adolescents compared to traditional methods. These games can effectively deliver consistent interventions and potentially lead to positive behavior changes in sexual health.	Successful development of serious games requires collaboration among experts in game design, sexual health, and behavior change. Rigorous evaluation through randomized controlled trials is necessary to establish the efficacy of these interventions.

No	Title	Study Design, Sample, and Variables	Intervention	Research Finding	Recommendation
					Addressing ethical issues such as consent and privacy is crucial when developing and implementing these games.
13.	<i>Video Game Intervention for Sexual Risk Reduction in Minority Adolescents: Randomized Controlled Trial (Fiellin et al., 2017)</i>	Randomized controlled trial, 333 adolescents aged 11 to 14 years, predominantly racial/ethnic minorities. Independent: Type of video game played (intervention vs. control). Dependent: Delay of initiation of intercourse, sexual health attitudes, knowledge, and intentions.	Game: PlayForward: A theory-driven, interactive video game aimed at improving sexual health knowledge and attitudes, and delaying the initiation of sexual intercourse.	No significant difference in delaying initiation of intercourse between intervention and control groups. Improved sexual health attitudes and knowledge in the intervention group, especially among boys and younger participants.	Assess the efficacy of the intervention in populations with higher rates of sexual initiation and explore its comparative effectiveness and implementation.
14.	<i>Yathu Yathu ("For us, by us"): Design of a cluster-randomised trial of the impact of community-based, peer-led comprehensive sexual and reproductive health services for adolescents and young people aged 15 to 24 in Lusaka, Zambia (Hensen, 2024)</i>	Cluster-randomized trial (CRT) with embedded process and economic evaluation, adolescents and young people aged 15 to 24 in two large peri-urban communities in Lusaka, Zambia. Independent: Community-based, peer-led SRH services with a loyalty card system. Dependent: Knowledge of HIV status and coverage of SRH services.	Videos: Community-based, peer-led hubs providing comprehensive SRH services. Prevention points cards (PPC) to incentivize service use. Community engagement activities to inform and involve adolescents and the broader community.	The study aims to evaluate the impact of the intervention on increasing knowledge of HIV status and coverage of SRH services among adolescents and young people.	The study will provide evidence on the effectiveness of community-based, peer-led SRH services and the use of loyalty cards to improve access to SRH services for adolescents and young people. If effective, this strategy could be replicated and scaled up in similar settings.
15.	<i>Effectiveness of Adolescent Reproductive Health Media in HEY (Health Educator for Youth) Activities for High</i>	Quantitative study with a quasi-experimental design, 60 high school students from 10 schools in Surabaya,	Mobile App: Remaja Sehat Mobile Application	The mobile application was more effective than the print module in improving self-efficacy, particularly in	Recommended for peer educator activities to improve adolescent health. Suggests revising health education

No	Title	Study Design, Sample, and Variables	Intervention	Research Finding	Recommendation
	<i>School Students in Indonesia (Harris et al., 2024)</i>	Indonesia. Independent: Type of media (print module vs. mobile application). Dependent: Knowledge, attitudes, and self-efficacy regarding reproductive health.		drug abuse prevention. Found in self-efficacy measurements between the two media types.	curricula to include more interactive and engaging media like mobile applications.

Policy Implications

It is important to integrate edutainment programs into the sexual health education curriculum in schools. These programs can be interactive games or mobile applications designed to improve students' knowledge and skills in sexual health. In addition, training for teachers to implement these methods effectively is essential. Schools also need to provide adequate technology facilities to support this program. Periodic evaluations should be conducted to ensure the effectiveness of the program and make adjustments if needed. Furthermore, policymakers should support the development and implementation of edutainment programs through adequate funding and regulations.

Policies that support collaboration between schools, communities, and health organizations are critical to the success of this program. In addition, policymakers should ensure that the program is accessible to all adolescents, including those in remote areas. Further research should be encouraged to evaluate and improve the effectiveness of edutainment programs continuously. Policies should also include training for educators and health care providers. In addition, health workers should be involved in the development and implementation of edutainment programs to ensure that the information is accurate and relevant. They should also play a role in providing sexual health education directly to adolescents, both in schools and in the community. Specialized training on the use of edutainment technologies and methods should be provided to health workers. In addition, they should collaborate with schools and policymakers to ensure the program runs

well. Evaluation and feedback from health workers are essential for program improvement.

Finally, the community should support and participate in edutainment programs for the prevention of promiscuous sex and HIV/AIDS. Parents and other community members should be involved in these programs to provide moral support and additional education at home. Awareness campaigns at the community level can increase acceptance and participation in these programs. In addition, the community should work with schools and health workers to create a supportive environment for adolescent sexual health. Active participation from the community will increase the effectiveness and sustainability of the edutainment program.

CONCLUSION

Overall, the results of these studies suggest that interactive technologies and digital games can be effective tools in sexual health education and HIV/AIDS prevention. The edutainment approach not only improves adolescents' knowledge and attitudes towards sexual health, but also increases their engagement and motivation in learning. Therefore, it is recommended to integrate digital technology and games in the sexual health education curriculum in schools to achieve better results in the prevention of promiscuous sex and HIV/AIDS in adolescents.

REFERENCES

Aswadi, A., Suriah, S., Stang, S., Jafar, N., Ibrahim, E., Amiruddin, R., & Syahrir, S. (2022). Edutainment as A

- Strategy of Child Sexual Abuse Prevention: Literatur Review. *Open Access Macedonian Journal of Medical Sciences*, 10(F), 141-145. <https://doi.org/10.3889/oamjms.2022.7670>
- Badan Pusat Statistik (BPS). (2017). *Badan Kependudukan dan Keluarga Berencana Nasional (BKKBN). 2017. Kementerian Kesehatan (Kemenkes). Dan ICF internasional. Survei Demografi Dan Kesehatan: Kesehatan Reproduksi Remaja 2017*. Badan Pusat Statistik (BPS). <https://www.bps.go.id/id/statistics-table/1/MjExMSMx/laporan-survei-demografi-dan-kesehatan-indonesia.html>
- Fiellin, L. E., Hieftje, K. D., Pendergrass, T. M., Kyriakides, T. C., Duncan, L. R., Dziura, J. D., Sawyer, B. G., Mayes, L., Crusto, C. A., Forsyth, B. W., & Fiellin, D. A. (2017). Video Game Intervention for Sexual Risk Reduction in Minority Adolescents: Randomized Controlled Trial. *Journal of Medical Internet Research*, 19(9), Article 9. <https://doi.org/10.2196/jmir.8148>
- Gambhir, S., & Panwar, N. (2024). Sexual Relationship Decision Making Based on Entertainment Media: A Qualitative Perspective Among Young Couples. *Human Arenas*, 1-33.
- Harris, N., Wiseman, N., Roche, E., Rachmayanti, R. D., Devi, Y. P., NA, K. D., & Fitriani, H. U. (2024). *Effectiveness of Adolescent Reproductive Health Media in HEY (Health Educator for Youth) Activities for High School Students in Indonesia*. https://ijicc.net/images/vol11iss10/111006_Nurmala_2020_E_R.pdf
- Haruna, H., Hu, X., Chu, S. K. W., Mellecker, R. R., Gabriel, G., & Ndekao, P. S. (2018). Improving Sexual Health Education Programs for Adolescent Students through Game-Based Learning and Gamification. *International Journal of Environmental Research and Public Health*, 15(9), Article 9. <https://doi.org/10.3390/ijerph15092027>
- Haruna, H., Okoye, K., Zainuddin, Z., Hu, X., Chu, S., & Hosseini, S. (2021). Gamifying Sexual Education for Adolescents in a Low-Tech Setting: Quasi-Experimental Design Study. *JMIR Serious Games*, 9(4), Article 4. <https://doi.org/10.2196/19614>
- Hensen, B. (2024, October 5). *Yathu Yathu ("For us, by us"): Design of a cluster-randomised trial of the impact of community-based, peer-led comprehensive sexual and reproductive health services for adolescents and young people aged 15 to 24 in Lusaka, Zambia—ScienceDirect*. <https://www.sciencedirect.com/science/article/pii/S1551714421003049>
- Jozkowski, K. N., & Ekbia, H. R. (2015). "Campus Craft": A Game for Sexual Assault Prevention in Universities. *Games for Health Journal*, 4(2), Article 2. <https://doi.org/10.1089/g4h.2014.0056>
- Marsch, L. A., Guarino, H., Grabinski, M. J., Syckes, C., Dillingham, E. T., Xie, H., & Crosier, B. S. (2015). Comparative Effectiveness of Web-Based vs. Educator-Delivered HIV Prevention for Adolescent Substance Users: A Randomized, Controlled Trial. *Journal of Substance Abuse Treatment*, 59, 30-37. <https://doi.org/10.1016/j.jsat.2015.07.003>
- Muthmainnah, Nurmala, I., Siswantara, P., Rachmayanti, R. D., & Devi, Y. P. (2021). Implementation of Adolescent Health Programs at Public Schools and Religion-Based Schools in Indonesia. *Journal of Public Health Research*, 10(4), Article 4. <https://doi.org/10.4081/jphr.2021.1954>
- Orozco-Olvera, V., Shen, F., & Cluver, L. (2019). The effectiveness of using entertainment education narratives to promote safer sexual behaviors of youth: A meta-analysis, 1985-2017. *PLOS ONE*, 14(2), e0209969. <https://doi.org/10.1371/journal.pone.0209969>
- Patel, V. V., Masyukova, M., Sutton, D., & Horvath, K. J. (2016). Social Media Use and HIV-Related Risk Behaviors in Young Black and Latino Gay and Bi Men and Transgender Individuals in New York City: Implications for Online Interventions. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 93(2), Article 2. <https://doi.org/10.1007/s11524-016-0025-1>

- Peskin, M. F., Coyle, K. K., Anderson, P. M., Laris, B. A., Glassman, J. R., Franks, H. M., Thiel, M. A., Potter, S. C., Unti, T., Edwards, S., Johnson-Baker, K., Cuccaro, P. M., Diamond, P., Markham, C. M., Shegog, R., Baumler, E. R., Gabay, E. K., & Emery, S. T. (2019). Replication of It's Your Game...Keep It Real! In Southeast Texas. *The Journal of Primary Prevention*, 40(3), Article 3. <https://doi.org/10.1007/s10935-019-00549-0>
- Priwardani, E. D. I., Wulandari, O. C., Salsabila, S., Putri, A. A., Amaniyah, R., Ramdani, K. B., & Permatasari, E. (2023). *SCHOOL-BASED INTERACTIVE REPRODUCTIVE HEALTH EDUCATION TO IMPROVE ADOLESCENT UNDERSTANDING OF HIV/AIDS* (1). 5(1), Article 1.
- Rohrbach, L. A., Donatello, R. A., Moulton, B. D., Afifi, A. A., Meyer, K. I., & De Rosa, C. J. (2019a). Effectiveness Evaluation of It's Your Game: Keep It Real, a Middle School HIV/Sexually Transmitted Infection/Pregnancy Prevention Program. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 64(3), Article 3. <https://doi.org/10.1016/j.jadohealth.2018.09.021>
- Rohrbach, L. A., Donatello, R. A., Moulton, B. D., Afifi, A. A., Meyer, K. I., & De Rosa, C. J. (2019b). Effectiveness Evaluation of It's Your Game: Keep It Real, a Middle School HIV/Sexually Transmitted Infection/Pregnancy Prevention Program. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 64(3), Article 3. <https://doi.org/10.1016/j.jadohealth.2018.09.021>
- Sejati, P. E., & Mufida, R. T. (2021). The Effect of Sex Education on Premarital Sex Among Adolescents; Literature Review. *Journal for Quality in Public Health*, 5(1), 363-366. <https://doi.org/10.30994/jqph.v5i1.280>
- Shabrina, S. R. N., Handoyo, P. H., & Harianto, S. (2023). Meluasnya Anggapan "Lumrah" Terhadap Sex Bebas Di kalangan Remaja Wilayah Perkotaan. *BANTENESE: JURNAL PENGABDIAN MASYARAKAT*, 5(1), 198-211. <https://doi.org/10.30656/ps2pm.v5i1.6647>
- Shegog, R., Armistead, L., Markham, C., Dube, S., Song, H.-Y., Chaudhary, P., Spencer, A., Peskin, M., Santa Maria, D., Wilkerson, J. M., Addy, R., Tortolero Emery, S., & McLaughlin, J. (2021). A Web-Based Game for Young Adolescents to Improve Parental Communication and Prevent Unintended Pregnancy and Sexually Transmitted Infections (The Secret of Seven Stones): Development and Feasibility Study. *JMIR Serious Games*, 9(1), Article 1. <https://doi.org/10.2196/23088>
- Shegog, R., Brown, K., Bull, S., Christensen, J. L., Hieftje, K., Jozkowski, K. N., & Ybarra, M. L. (2015). Serious Games for Sexual Health. *Games for Health Journal*, 4(2), 69-77. <https://doi.org/10.1089/g4h.2014.0139>
- Shegog, R., Craig Rushing, S., Gorman, G., Jessen, C., Torres, J., Lane, T. L., Gaston, A., Revels, T. K., Williamson, J., Peskin, M. F., D'Cruz, J., Tortolero, S., & Markham, C. M. (2017). NATIVE-It's Your Game: Adapting a Technology-Based Sexual Health Curriculum for American Indian and Alaska Native youth. *The Journal of Primary Prevention*, 38(1-2), Article 1-2. <https://doi.org/10.1007/s10935-016-0440-9>
- Syafitriani, D., Trihandini, I., & Irfandi, J. (2022). Determinan Perilaku Seks Pranikah Pada Remaja (15-24 Tahun) Di Indonesia (Analisis SDKI 2017). *Jurnal Kesehatan Komunitas*, 8(2), 205-218. <https://doi.org/10.25311/keskom.Vol8.Iss2.1162>
- United Nations. (2015). *The 17 Goals SDG's. Sustainable development Department of Economic and Social Affairs*. United Nations (UN). <https://sdgs.un.org/goals>
- Wang, H. (2009). Serious Games—Entertainment Education through Digital-Games. In *Entertainment Education through Digital-Games* (p. Chapter 17).
- Winskell, K., Sabben, G., Akelo, V., Ondeng'e, K., Obong'o, C., Stephenson, R., Warhol, D., &

Mudhune, V. (2018). A Smartphone Game-Based Intervention (Tumaini) to Prevent HIV Among Young Africans: Pilot Randomized Controlled Trial. *JMIR mHealth and uHealth*, 6(8),

Article 8.
<https://doi.org/10.2196/10482>
World Health Organization. (2018). *Orientation Programme on Adolescent Health for Healthcare Provider Handout New Modules*.