

Development of PRASASTI Application as Educational Media to Improve Adolescents' Knowledge on Reproductive Health and Prevention of Risky Sexual Behavior

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ABSTRACT

Adolescence is a crucial transition phase vulnerable to risky behaviors such as free sex, which can lead to Sexually Transmitted Infections (STIs) and Unwanted Pregnancies (KTD). A lack of reproductive health literacy is one of the main factors that increases adolescents' vulnerability to these risks. This study aims to develop the PRASASTI application and evaluate adolescents' understanding of reproductive health, STIs, and prevention of risky sexual behavior. This study contributes by developing PRASASTI, a digital educational application designed to improve adolescents' literacy regarding reproductive health and the prevention of risky sexual behavior. The research method used was Research and Development (R&D) through the stages of need analysis, design, development, validation, and limited trial, involving 24 IPPNU adolescent respondents in Bogelan Village, Wonosobo. Data were collected using a structured true-false questionnaire and analyzed descriptively using percentage distribution. The results showed that most respondents had a very high level of knowledge: 100% correctly identified STI types, PMS symptoms, and the psychological impact of free sex, while understanding of puberty, HIV transmission, and the physical impact of STIs reached above 85%. In conclusion, PRASASTI is useful as adolescent-friendly educational media that can support reproductive health literacy, strengthen prevention of risky sexual behavior, and encourage healthier decision-making among adolescents.

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INTRODUCTION

Adolescence is a crucial transition from childhood to adulthood because rapid biological, cognitive, emotional, and social changes occur in a relatively short period. At this stage, adolescents begin to build identity, expand peer relationships, and develop independence in making decisions. These developmental changes are accompanied by maturation of reproductive organs, puberty, and increased curiosity about sexuality. When adolescents do not receive accurate information, their curiosity can be shaped by peers, social media, or other unreliable sources. This situation makes reproductive health literacy an important protective factor for adolescents. Adequate literacy helps adolescents recognize normal body changes, respect personal boundaries,

and understand the consequences of risky behavior. Therefore, adolescent reproductive health education needs to be delivered in a way that is clear, accessible, and appropriate to adolescents' developmental needs ([Hanifah et Al., 2022](#); [Santroek, 2018](#))

Risky sexual behavior among adolescents has serious consequences for physical, psychological, and social well-being. Casual sex, especially when it occurs without adequate knowledge and protection, increases the risk of sexually transmitted infections (STIs), HIV transmission, and unwanted pregnancy. The World Health Organization states that more than one million curable STIs are acquired every day worldwide, while STIs can cause infertility, pregnancy complications, cancers, and increased risk of HIV infection ([World Health Organization, 2024a](#)). Adolescent pregnancy also remains a global public health concern because girls aged 15-19 years in low- and middle-income countries experience around 21 million pregnancies each year, and approximately half of these pregnancies are unintended ([World Health Organization, 2024a](#)) These risks show that adolescent reproductive health problems are not only individual issues but also family, educational, and community concerns. For this reason, prevention must combine correct information, supportive communication, and media that adolescents are willing to use. Education that is merely informative is not sufficient if it does not reach adolescents in their daily learning environment.

In Indonesia, discussion of sexuality and reproductive health is often still considered sensitive, even though adolescents need guidance before they face risky situations. Lack of open communication can make adolescents seek answers from friends or digital content whose accuracy is difficult to verify. This condition may create misconceptions about puberty, menstruation, STIs, HIV transmission, consent, and the prevention of unwanted pregnancy. Family, school, health workers, and community organizations have an important role in providing safe and responsible information. However, conventional education is sometimes limited by time, place, and adolescents' reluctance to ask questions directly. Digital media can help reduce these barriers because adolescents are familiar with smartphones and online learning formats. Thus, reproductive health education should move toward interactive, youth-friendly, and evidence-based media without abandoning ethical and cultural values.

Previous studies have shown that counseling, lectures, and community education can increase adolescents' knowledge about reproductive health and the prevention of free sex. For example, counseling about the dangers of free sex has been associated with improved adolescent knowledge ([Bachruddin et Al., 2017](#)). Education on preventing promiscuity also emphasizes the importance of family communication, self-control, social ethics, and wise use of social media ([Amira et al., 2023](#)) Reproductive health education for adolescents is also relevant for preventing unwanted pregnancy because adolescents need to understand risks before making decisions ([Rukmasari, 2024](#)) These studies provide an important basis that structured health promotion is needed in adolescent communities. Nevertheless, many interventions still rely on one-way delivery and printed or lecture-based materials. Such approaches may be less attractive for adolescents who are accustomed to interactive digital information.

The state of the art in adolescent reproductive health education increasingly points to mobile health and digital interventions. Systematic and scoping reviews show that mHealth interventions can improve adolescents' sexual and reproductive health knowledge, attitudes, information seeking, and access to services, although long-term behavioral outcomes still require

stronger evidence ([Isaacs et al., 2024](#); [Onukwugha et al., 2022](#)) Digital school-based interventions have also been tested through rigorous designs and show that technology can be integrated into adolescent family planning and reproductive health education ([Hémono et al., 2024](#)). Online sexuality education modules can promote knowledge and attitude change when the material is structured and appropriate to adolescents' needs ([Chen et al., 2023](#)) These findings indicate that digital media is not merely a technological trend but a potential educational strategy. However, digital media must still be developed through a systematic process so that its content is accurate, readable, and relevant. Therefore, application-based education needs to be designed with attention to content validity, adolescent language, and ease of use.

Previous studies mostly focused on conventional reproductive health counseling and health promotion through lectures or printed media. Research examining interactive digital applications specifically designed to prevent risky sexual behavior among adolescents remains limited, especially in small community-based adolescent organizations. Therefore, the development of PRASASTI offers novelty through mobile-based educational intervention emphasizing STI prevention, unwanted pregnancy prevention, and reproductive health literacy. PRASASTI is positioned not only as a digital source of information but also as a learning medium that presents key concepts in a concise, structured, and adolescent-friendly manner. The application is expected to help adolescents learn privately, repeat material when needed, and evaluate their understanding through simple questions. This novelty is important because adolescents need educational media that can bridge formal health messages and their daily digital habits. In this context, PRASASTI becomes an alternative innovation to strengthen reproductive health promotion at the community level.

The PRASASTI application contains educational material related to adolescence, puberty, menstruation, premenstrual symptoms, STIs, HIV transmission, psychological consequences of casual sexual behavior, and efforts to prevent risky sexual behavior. The material is arranged to help adolescents move from basic concepts toward preventive attitudes and responsible decision-making. The application also supports learning through concise explanations and evaluation questions that are easy to understand. This design is relevant for IPPNU adolescents in Bogelan Village because community-based youth groups need media that can be used collectively during education sessions and individually after the activity. By using digital educational media, the learning process becomes more flexible and attractive than a single lecture session. The expected benefit is not only increased knowledge but also stronger awareness of personal boundaries, healthy relationships, and future orientation. Therefore, PRASASTI is developed as an innovation that connects reproductive health literacy with practical prevention of risky behavior.

Based on this background, the problem addressed in this study is how PRASASTI can be developed as educational media and how adolescents understand reproductive health, STIs, and prevention of risky sexual behavior after using the media. This study is urgent because adolescents require accurate and accessible education before misinformation leads to harmful choices. The important value of this study lies in its attempt to create a digital educational product that can be used in adolescent health promotion activities. The findings are expected to benefit adolescents, youth organizations, educators, and health workers by providing practical media for reproductive health education. This study also contributes to creativity and innovation in health education because it combines community needs with digital learning. Therefore, this study aims to develop

and evaluate the effectiveness of PRASASTI application in improving adolescents' understanding regarding reproductive health, sexually transmitted infections, and prevention of risky sexual behavior. The results are expected to become a basis for further development and broader testing of PRASASTI in larger adolescent populations.

METHODS

This study used a Research and Development (R&D) approach because the main purpose was to produce and test educational media in the form of the PRASASTI application. R&D was selected because this approach allows researchers to identify learning needs, design a product, develop media, validate content, and conduct a limited trial before wider implementation. The product developed in this study is an adolescent reproductive health educational application focusing on puberty, menstruation, STIs, HIV transmission, unwanted pregnancy, and prevention of risky sexual behavior. This approach is suitable for creativity and innovation research because the output is not only knowledge description but also a practical educational product that can be used by adolescents and facilitators ([Sugiyono, 2019](#)).

The development design adapted the R&D stages into five practical steps: need analysis, design, development, validation, and trial. The need analysis stage identified adolescents' learning needs regarding reproductive health and risky sexual behavior. The design stage arranged the learning objectives, material sequence, display flow, and evaluation items. The development stage produced the PRASASTI application as digital educational media. The validation stage involved expert judgement to review content relevance, clarity of language, and suitability for adolescent users. The trial stage was conducted with all IPPNU adolescents in Bogelan Village, Mojotengah District, Wonosobo Regency, on December 13, 2025, involving 24 respondents.

The research instrument was a structured questionnaire consisting of 10 true-false items that represented the main indicators in the PRASASTI material. The questionnaire used a Guttman scale, where a correct answer was scored 1 and an incorrect answer was scored 0. The items covered adolescents' understanding of adolescence, puberty, menstruation, premenstrual symptoms, STIs, gender vulnerability to STIs, STI types, psychological impact of casual sex, prevention of free sex, and HIV transmission. Content validity was reviewed through expert judgement by considering item relevance, clarity, and consistency with the application material. Readability and reliability of item interpretation were checked during the limited trial to ensure that respondents understood each statement as intended. A questionnaire was used because it allows respondents to answer a set of written statements systematically and makes the results easier to summarize ([Ulfah & Arifudin, 2021](#)).

The data collected in this study were respondents' answers to the questionnaire after using the PRASASTI application. Data were analyzed descriptively using percentage distribution. The percentage of correct and incorrect answers was calculated for each item to describe the level of adolescent understanding of the material. The results were then presented in figures and interpreted by comparing the percentage of respondents' answers with the concepts discussed in previous studies. This analysis was used to determine which materials were well understood and which aspects still required further strengthening in future educational activities.

RESULTS AND DISCUSSION

Before presenting the knowledge results, the developed media needs to be explained. PRASASTI is a digital educational application designed as adolescent-friendly learning media on reproductive health and prevention of risky sexual behavior. The application contains concise material on adolescence, puberty, menstruation, premenstrual symptoms, STIs, HIV transmission, psychological impact of casual sex, and strategies to prevent free sex and unwanted pregnancy. The media was designed so that adolescents can learn through short explanations and then reflect on their understanding through true-false questions. This structure makes PRASASTI different from conventional lecture-based education because the material can be accessed repeatedly and supports independent learning. In this study, PRASASTI was used as the main learning tool, and adolescents' understanding was assessed to describe how far the media could support reproductive health literacy and healthy decision-making.

Adolescence as an Important Transition Phase to Adulthood

Humans experience stages of development from infancy, childhood, adolescence, to adulthood, and adolescence is an important phase because it is a transition period toward adulthood. Adolescence can be understood as a period marked by biological, cognitive, and social-emotional changes, accompanied by increasingly visible physical development. In this phase, puberty and sexual development occur due to physiological changes, so adolescents begin to leave childish behavior patterns and form more mature attitudes. Understanding adolescence as a transition phase is important because it helps adolescents recognize that physical and emotional changes are normal parts of development. This understanding also becomes the foundation for learning reproductive health, personal boundaries, and prevention of risky behavior ([Hanifah et Al., 2022](#); [Santrock, 2018](#)).

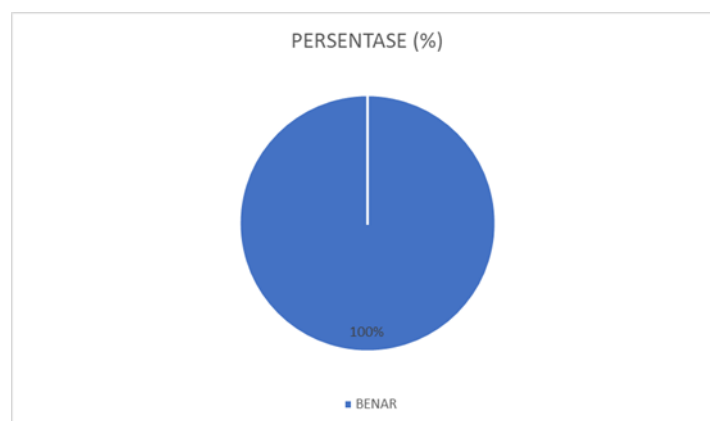


Figure 1. Percentage of Respondents' Answers regarding Understanding Adolescence as a Transition Phase

Based on the result data in Figure 1, all respondents gave correct answers. This shows that the level of teenagers' understanding of the basic concepts of adolescence is very good and relatively even. When teenagers understand that adolescence is a period of change and adjustment toward adulthood, they will be better prepared to accept further material, such as physical and psychological changes, reproductive health, and various behavioral risks, including casual sex and

unwanted pregnancy. This result supports the view that basic developmental knowledge should be introduced before more sensitive reproductive health topics are discussed.

Puberty as a Process of Reproductive Maturation and Physical-Emotional Change

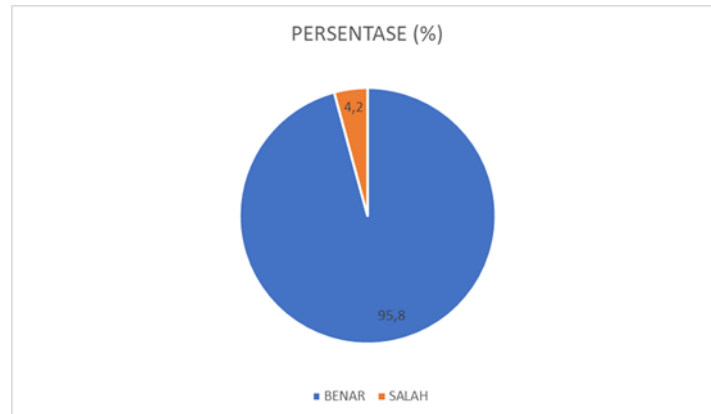


Figure 2. Percentage of Respondents' Answers regarding Understanding of Puberty

Based on the data in Figure 2, the majority of respondents answered correctly, namely 23 out of 24 teenagers (95.8%), and only 1 respondent (4.2%) answered incorrectly. This shows that the participants' understanding of puberty as a process of bodily maturation and reproductive function accompanied by physical and emotional changes is very good. Puberty is a developmental phase when children begin to enter sexual maturity, marked by active reproductive function and the emergence of sexual interest. Puberty can be called a special period because it brings about developmental changes that are not found at other stages of life. The physical changes that occur are comprehensive, both to the external body and internal organs, so they also influence the psychological and emotional conditions of adolescents ([Safira & Yarni, 2024](#)). This finding aligns with research by ([Febriany et Al., 2024](#)). Indicating adolescents with adequate reproductive literacy tend to demonstrate better awareness regarding puberty changes.

Adolescents' Understanding of Menstruation as a Sign of Female Puberty

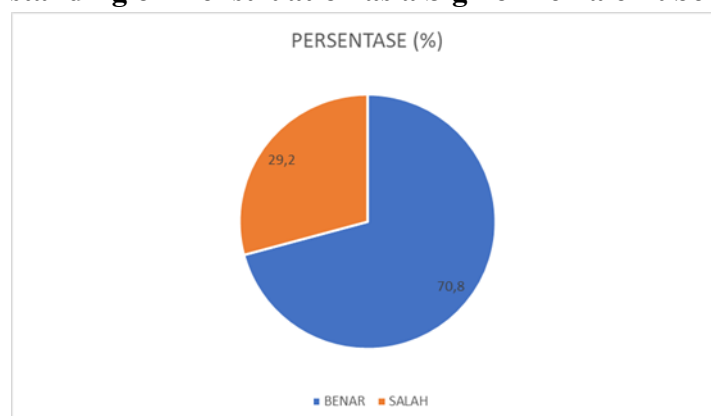


Figure 3. Percentage of Respondents' Answers regarding Menstruation as a Sign of Female Puberty

Based on Figure 3, out of a total of 24 respondents, 17 respondents (70.8%) gave the answer "False", while 7 respondents (29.2%) answered "True" to the statement "Menstruation is not a sign

that women are entering puberty". These results indicate that the majority of respondents have a good level of knowledge regarding the signs of puberty, especially regarding biological changes in adolescent girls. Adolescence is a developmental phase marked by significant changes in physical, psychological and emotional aspects, as part of the transition process from childhood to adulthood. In this phase, the maturation of the reproductive organs occurs, known as puberty. One of the clearest biological signs in adolescent girls is menstruation, which indicates that the reproductive system has begun to function. Understanding the puberty process, including menstruation, is useful for adolescents in recognizing body changes and forming healthy attitudes and behavior in maintaining reproductive health and preventing risky behavior ([Febriany et Al., 2024](#)).

Adolescents' Knowledge about Premenstrual Symptoms

Premenstrual Syndrome (PMS) is a disorder commonly experienced by women from adolescence to adulthood, which is related to the menstrual cycle. This condition is characterized by the appearance of various physical and emotional symptoms that are relatively consistent, especially in the luteal phase of the menstrual cycle. A person is said to be experiencing PMS if complaints begin to be felt about a week to a few days before menstruation, then gradually disappear after menstruation begins, although in some cases the symptoms can last until menstruation ends. Complaints that appear generally include emotional disorders such as irritability and anxiety, as well as physical symptoms such as headaches, flatulence, nausea, enlargement and pain in the breasts ([Italia & Ramona, 2021](#)).

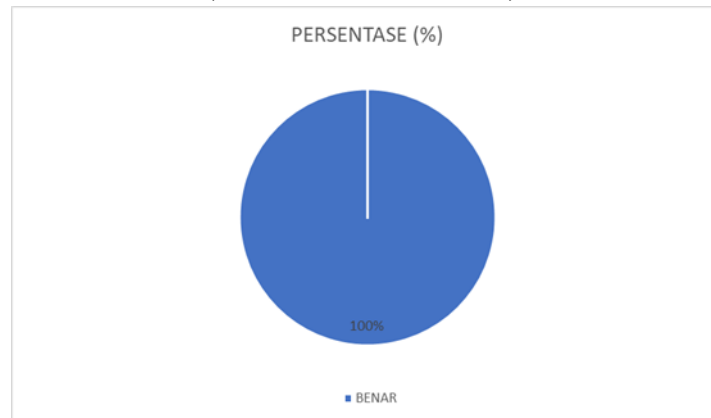


Figure 4. Percentage of Respondents' Answers regarding Premenstrual Symptom Statements

Based on Figure 4, all 24 respondents (100%) answered "True" to the statement "Headaches, breast pain, acne, flatulence and mood swings are premenstrual symptoms." This answer is scientifically appropriate because the symptoms mentioned are part of premenstrual syndrome (PMS), which is commonly experienced by women before menstruation. This result is consistent with ([Italia & Ramona, 2021](#)), who explain that PMS involves physical and emotional complaints that appear before menstruation and gradually decrease after menstruation begins.

Adolescents' Knowledge about the Understanding and Impact of Sexually Transmitted Infections (STIs)

Sexually Transmitted Infections (STIs) are diseases or infections whose transmission occurs mainly through sexual intercourse, whether genitally, orally, or anally ([Puspita, 2017](#)). STIs can be caused by various infectious agents, such as bacteria, viruses, parasites, and fungi, and have the potential to seriously affect sexual and reproductive health, including infertility, pregnancy complications, and increased risk of HIV transmission if not treated appropriately. The World Health Organization reports that STIs have a profound impact on reproductive health and that more than one million curable STIs are acquired every day worldwide ([World Health Organization, 2024b](#)). Adolescents are a vulnerable group because curiosity, limited knowledge, peer influence, and low access to youth-friendly information can increase exposure to risky sexual behavior. Therefore, strengthening STI education through PRASASTI is relevant to help adolescents understand both transmission and prevention.

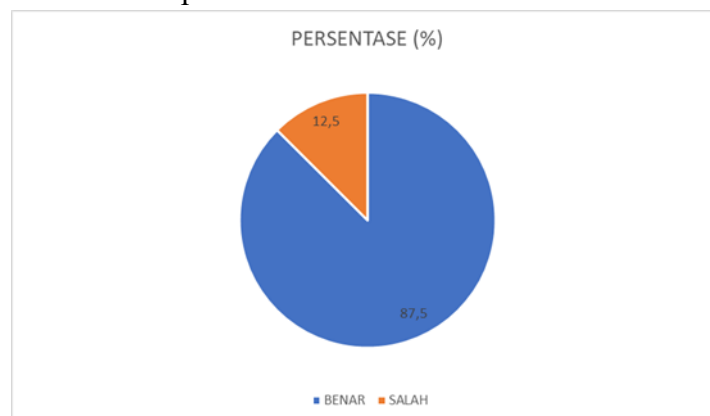


Figure 5. Percentage of Respondents' Answers regarding Statements on the Understanding and Impact of Sexually Transmitted Infections (STIs)

The results obtained in Figure 5 show that the majority of respondents have a good understanding of the basic concepts of Sexually Transmitted Infections (STIs), where 21 out of 24 respondents (87.5%) gave the correct answer to statements regarding the transmission and impact of STIs. This illustrates that the majority of teenagers are aware that STIs are closely related to unsafe sexual behavior and have the potential to have serious consequences, not only for individual health but also for public health. However, there are still a small number of respondents who have not answered correctly, and this shows that strengthening reproductive health education has not been optimal. This result is in line with the need for repeated and accessible health education because STI prevention requires both knowledge and responsible behavior.

Adolescents' Understanding of STIs in Boys and Girls

Epidemiologically, STIs can be experienced by both women and men. Although women are often considered to bear a greater biological burden of reproductive health complications, men have the same vulnerability to exposure to bacterial and viral pathogens and can play a central role in the chain of disease transmission. WHO also states that more than 30 different bacteria, viruses, and parasites are known to be transmitted through sexual contact, and this transmission is not limited to one gender ([World Health Organization, 2024b](#)). Therefore, adolescents of all genders need to receive the same reproductive health information so that prevention is not understood as the responsibility of girls only.

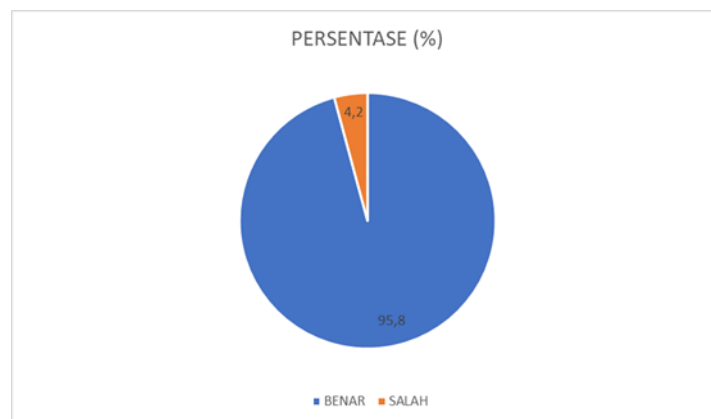


Figure 6. Percentage of Respondents' Answers regarding the Statement that STIs Are Not Limited to Female Gender

The results from Figure 6 show that the majority of respondents understand that sexually transmitted infections (STIs) are not only experienced by women. Of the total 24 respondents, 23 respondents (95.8%) gave the answer "False", which is in accordance with the concept of reproductive health, while 1 respondent (4.2%) still answered "True". This finding indicates that most respondents have understood gender vulnerability in STI transmission, although one respondent still needs reinforcement. The result also supports the importance of presenting STI prevention as a shared responsibility between boys and girls.

Adolescents' Knowledge about Types of Sexually Transmitted Infections

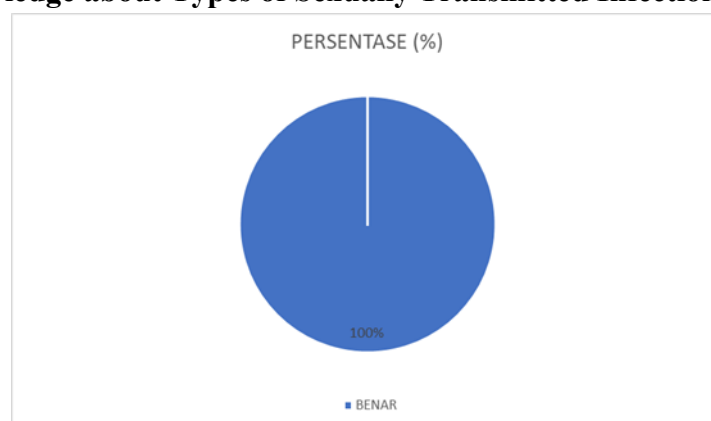


Figure 7. Percentage of Respondents' Answers regarding Statements on Types of Sexually Transmitted Infections

Based on Figure 7, all 24 respondents (100%) answered "True" to the statement "Chlamydia, syphilis, gonorrhea, fungal infections (candida), genital warts, herpes simplex, hepatitis B, genital lice, and HIV/AIDS are types of sexually transmitted diseases." This answer shows that all respondents have a very good level of knowledge regarding various sexually transmitted infections (STIs). STIs include various diseases that are transmitted mainly through sexual contact, whether vaginal, oral, or anal. Chlamydia and gonorrhea are STIs caused by bacteria and often have no symptoms, but they can cause serious complications such as infertility if left untreated. Syphilis is also caused by bacteria and can develop into a dangerous systemic condition if not treated properly. Apart from that, STIs caused by viruses include herpes simplex, genital warts (Human Papillomavirus/HPV), hepatitis B, and HIV/AIDS, which require appropriate prevention and treatment. This finding is consistent with WHO's classification of

major STI pathogens and shows that the PRASASTI material was understandable for respondents ([Puspita, 2017](#); [World Health Organization, 2024b](#)).

Adolescents' Understanding of the Psychological Impact of Casual Sexual Behavior

Casual sexual behavior not only impacts physical aspects and reproductive health, but also has significant psychological consequences. Psychologically, individuals who engage in casual sex often experience feelings of guilt, regret, anxiety, and inner conflict, especially when this behavior conflicts with moral values, social norms, and personal beliefs. This condition can trigger emotional stress, decreased self-esteem, and even mental health disorders such as depression and anxiety. In adolescents, this psychological impact tends to be stronger because the emotional development phase is not yet stable and decision-making abilities are still developing ([Santrock, 2018](#)).

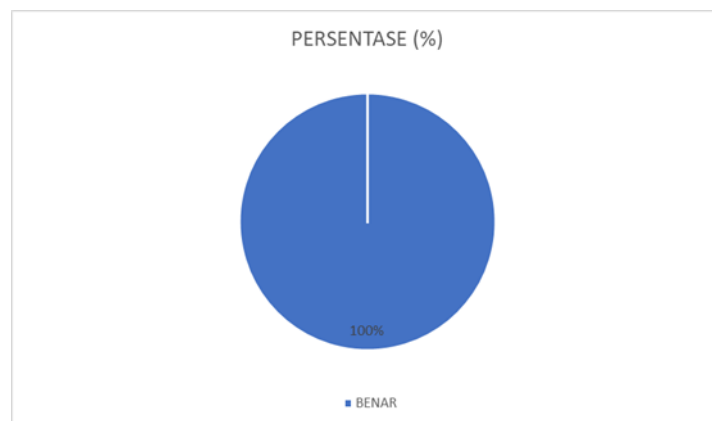


Figure 8. Percentage of Respondents' Answers regarding the Statement on the Psychological Impact of Casual Sex

Based on Figure 8, 100% of respondents answered "True" to the statement "Some casual sex offenders often feel regret and guilt because in their conscience this behavior is considered wrong and forbidden to do so." This answer shows that all respondents have a very good understanding of the psychological impact of casual sexual behavior. Feelings of regret and guilt are forms of emotional responses that often arise due to conflicts between the behavior carried out and moral values, social norms, or personal beliefs held by individuals. The high level of respondents' awareness of this psychological impact shows that teenagers not only understand the risks of casual sex from a physical and health perspective, but also from a psychological aspect, which has the potential to affect mental health, self-confidence and long-term emotional well-being ([Budiarto, 2019](#)).

Adolescents' Perceptions of Efforts to Prevent Casual Sex

Efforts to prevent free sex among teenagers need to be carried out by involving families, schools and the social environment. An important first step is to open communication about sexuality openly and responsibly, so that teenagers receive correct information and do not form perceptions from wrong sources. Teenagers also need to be given an understanding of the risks and impacts of promiscuity, both in terms of physical, psychological and social health. Supporting teenagers' involvement in positive activities such as education, sports and developing talent interests can help direct their energy and time to more constructive activities. In addition, the implementation of reasonable rules and supervision, including curfew restrictions, as well as the

habit of using social media wisely, plays a role in minimizing exposure to negative influences ([Amira et al., 2023](#)).

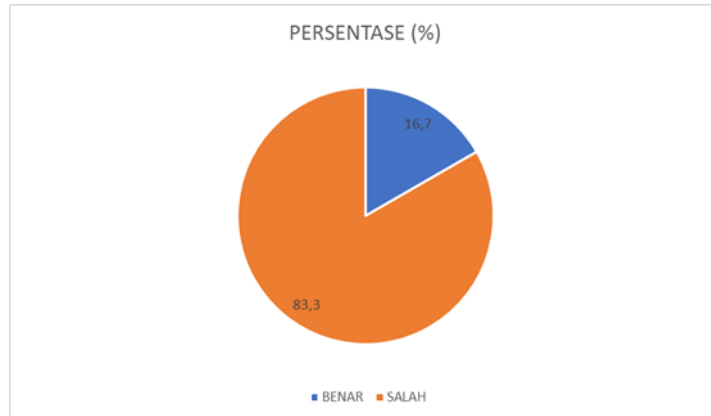


Figure 9. Percentage of Respondents' Answers regarding Statements on Efforts to Prevent Free Sex among Adolescents

The data results in Figure 9 show that of the 24 respondents, 20 respondents (83.3%) gave the answer "False", while 4 respondents (16.7%) chose "True" in the statement "Teenager social ethics, maintaining personal boundaries, building healthy relationships, being wise in using social media, and focusing on the future are not preventions of free sex." These results indicate that the majority of respondents have a fairly good understanding of the importance of values, self-control, and future orientation in forming responsible sexual behavior. This result is consistent with ([Amira et al., 2023](#)), who emphasize that prevention of promiscuity requires family involvement, positive activities, responsible communication, and wise use of social media. Nevertheless, the existence of incorrect answers shows that prevention messages should continue to be repeated in concrete examples that are close to adolescents' daily lives.

Adolescents' Knowledge about How HIV is Transmitted

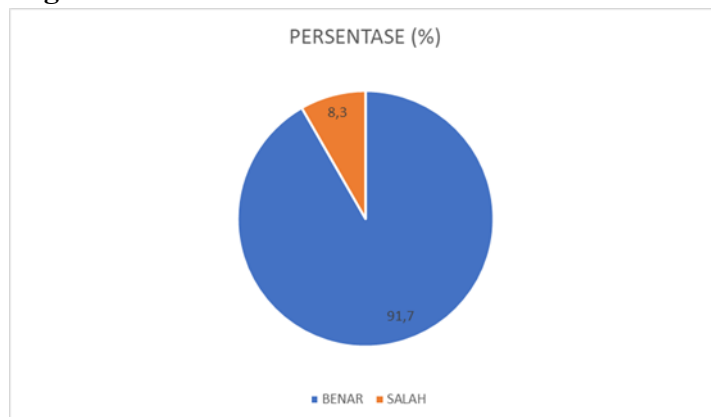


Figure 10. Percentage of Respondents' Answers regarding Statements on How HIV is Transmitted

Based on Figure 10, of the 24 respondents, 22 respondents (91.7%) answered "True", while 2 respondents (8.3%) answered "False" to the statement "HIV can be transmitted through direct contact between the inner layers of the skin or the bloodstream and fluids containing the HIV virus". The answer "True" is the correct answer because HIV transmission occurs through contact with bodily fluids containing the virus, such as blood, semen, vaginal fluids, and breast milk, which enter the body through open wounds, mucous membranes, or the bloodstream. Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) are still

public health issues because transmission is closely related to risky sexual behavior, contact with infected blood, and inadequate preventive knowledge. Transmission can also occur via the parenteral route, such as contact with infected blood, as well as in individuals with a history of sexually transmitted infections ([Riyatin et al., 2019](#)) This finding indicates that most respondents already understand basic HIV transmission, but a small proportion still need clearer explanation to prevent misconception and stigma.

CONCLUSION

This study developed PRASASTI as digital educational media and evaluated adolescents' understanding of reproductive health, STIs, and prevention of risky sexual behavior among IPPNU adolescents in Bogelan Village. The findings show that respondents generally had very good knowledge after using the media, as reflected in the high percentage of correct answers across the questionnaire indicators. All respondents (100%) correctly understood the basic concept of adolescence, PMS symptoms, STI types, and the psychological impact of casual sexual behavior, while understanding of puberty, STI impact, gender vulnerability to STIs, and HIV transmission reached more than 87%. Variations were still found in the understanding of menstruation as a sign of puberty and the ethics of preventing free sex, indicating that these topics require further reinforcement. The impact of this study is that PRASASTI can be used as practical and adolescent-friendly educational media to strengthen reproductive health literacy, prevent risky sexual behavior, and support healthier decision-making. Future studies are recommended to test PRASASTI application effectiveness using experimental design and larger populations.

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