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# THE EFFECT OF USING VIRASAT MEDIA (VIRTUAL REALITY–BASED SEXUAL EDUCATION) ON ADOLESCENT BEHAVIORS LEADING TOWARD FREE SEX

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**ABSTRACT**
Currently, it is estimated that there are 39.9 million people living with HIV worldwide. In the Asia-Pacific region, there are approximately 6.7 million people living with HIV. In Indonesia, it is estimated that there are around 564,000 people living with HIV. Data from the National Commission for Child Protection shows that 93.7% of adolescents in Indonesia have engaged in kissing, petting, and oral sex. Adolescents' knowledge regarding sexuality is still relatively low. Sexual education is a way to reduce the spread of sexually transmitted diseases. This study aims to determine the influence of VIRASAT (Virtual Reality Sexual Education) media on adolescent behavior leading to free sex. This study used a pre-experimental one-group pretest–posttest design involving 80 students from SMAN 14 Ambon selected through stratified random sampling. Data on knowledge, attitudes, and behaviors related to free sex were collected using a structured questionnaire administered before and after a virtual reality–based sexual education (VIRASAT) intervention under researcher supervision. The effect of the intervention was analyzed using a paired t-test. The results showed that after the intervention, the majority of respondents had high knowledge (63.8%) with a p-value of 0.013. After the intervention, the majority of respondents had a positive attitude (67.5%) with a p-value of 0.005. After the intervention, the majority of respondents exhibited non-risky behavior (68.8%) with a p-value of 0.004. Thus, it can be interpreted that there is a significant influence between the use of VIRASAT (virtual reality sexual education) media on adolescent behavior leading to free sex at SMAN 14 Ambon. The use of VIRASAT (Virtual Reality Sexual Education) media had a significant effect on adolescents' knowledge, attitudes, and behaviors related to free sex at SMAN 14 Ambon. After the intervention, most respondents demonstrated high knowledge, positive attitudes, and non-risky sexual behaviors, indicating that VIRASAT is an effective educational medium for preventing risky sexual behavior among adolescents.

Keywords: adolescent behavior; free sex; sexual education; VR

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## INTRODUCTION

Risky sexual behavior among adolescents remains a major public health concern, particularly due to inadequate knowledge and limited access to effective reproductive health education. Adolescents often engage in sexual activities without sufficient awareness of the associated physical, psychological, and social risks, contributing to increased vulnerability to sexually transmitted infections (STIs) and other adverse outcomes (Anggraini et al., 2022). According to the World Health Organization (2024), a declining trend in condom use among adolescents has heightened the risk of STIs, including HIV/AIDS, gonorrhea, syphilis, and herpes (WHO, 2024). Globally, the HIV epidemic remains critical, with an estimated 39.9 million people living with HIV and approximately 9.3 million individuals lacking access to life-saving treatment. In the Asia-Pacific region, which accounts for 23% of new global HIV infections, treatment coverage remains suboptimal, including

in Indonesia, one of the countries with the highest HIV burden in the region (Kemenkes RI, 2025; UNAIDS, 2024).

Adolescence is a developmental phase characterized by rapid biological and psychosocial changes, often accompanied by curiosity, risk-taking tendencies, and emerging sexual desire. When these factors are not balanced by adequate knowledge, parental guidance, and structured sexual education, adolescents are more likely to engage in risky sexual behaviors ((Nazarlin et al., 2024; Ningsih et al., 2024; Miswanto, 2019; Wahani et al., 2021). Despite evidence supporting the protective role of sexual education, discussions surrounding sexuality remain controversial in many settings, including Indonesia, limiting adolescents' access to accurate and comprehensive information (Febriagivary, 2021).

Schools play a strategic role in providing structured sexuality education. Previous studies have demonstrated that school-based sexual education contributes to improved psychological resilience and delayed sexual initiation among adolescents (Gerda et al., 2022). However, conventional teaching methods are often perceived as unengaging and insufficient to influence behavior change, highlighting the need for innovative educational approaches (Kustandi et al., 2021).

Virtual reality (VR) has emerged as an interactive learning medium capable of providing immersive and realistic educational experiences. Evidence suggests that VR-based learning enhances cognitive engagement, motivation, and comprehension, making it particularly suitable for adolescent learners (Abror et al., 2018; Supriadi & Hignasari, 2019). Interactive educational media have also been shown to be more effective than traditional methods in increasing adolescents' awareness of reproductive health risks (Vidayanti et al., 2020).

In the context of sexual education, VR offers a promising approach to delivering sensitive content in an engaging and impactful manner. VR-based interventions have demonstrated potential in improving adolescents' knowledge, attitudes, and decision-making related to sexual health (Doyle et al., 2020). Nevertheless, empirical evidence on the effectiveness of VR in reducing behaviors associated with free sex among adolescents remains limited. Therefore, this study aims to examine the effect of VIRASAT (Virtual Reality Sexual Education) media on adolescent behaviors related to free sex, providing evidence to support the development of innovative, technology-based sexual education strategies tailored to adolescents' needs.

## METHOD

This study employed a quantitative pre-experimental design using a one-group pretest–posttest approach to examine the effect of VIRASAT (Virtual Reality Sexual Education) on adolescents' knowledge, attitudes, and behaviors related to free sex, with direct researcher involvement in the intervention process (Sugiyono, 2018). The study was conducted at SMAN 14 Ambon in August 2025. The population consisted of 163 students, from which 80 participants were selected using purposive sampling to ensure alignment with the research objectives. Data were collected using a structured questionnaire administered to students in grades XI and XII after obtaining informed consent.

The questionnaire was developed based on relevant literature and previous studies related to adolescent sexual behavior. Content validity was assessed through expert judgment involving three public health and nursing education experts, and all items were declared valid after revision. Construct validity was tested using item–total correlation, with all items showing correlation coefficients above the acceptable threshold ($r > 0.30$). Reliability testing was conducted using Cronbach's alpha, yielding values of 0.82 for the knowledge scale, 0.85 for the attitude scale, and 0.80 for the behavior scale, indicating good internal consistency. A pretest was conducted to assess baseline knowledge, attitudes, and behaviors, followed by a VR-based health education intervention

consisting of a 10-minute VR session and a 5-minute demonstration, delivered over a 30-day period with 20 days of VR exposure. After a nine-day interval, a posttest was administered using the same instrument to evaluate changes in outcomes. Data analysis included univariate analysis using frequency distributions and percentages, and bivariate analysis using a paired t-test to assess the effect of the intervention on adolescents' knowledge, attitudes, and behaviors related to free sex.

## RESULT

Table 1.
Adolescent Knowledge That Leads to Free Sex Before and After Being Given Sex Education Through VR a

| Knowledge | Pretest | | Posttest | |
|---|---|---|---|---|
| | f | % | f | % |
| Low | 49 | 61.2 | 29 | 36.2 |
| Height | 31 | 38.8 | 51 | 63.8 |

Table 1, the pretest results show the level of adolescents' knowledge at SMAN 14 Ambon before receiving sexual education on free-sex behavior. The data indicate that the majority of respondents had a low level of knowledge, with 49 respondents (61.2%), while 31 respondents (38.8%) had a high level of knowledge. The posttest results illustrate adolescents' knowledge levels at SMAN 14 Ambon after receiving sexual education on free-sex behavior. The findings reveal that most respondents demonstrated a high level of knowledge, totaling 51 respondents (63.8%), while 29 respondents (36.2%) remained in the low knowledge category.

Table 2.
Adolescent Attitudes That Lead to Free Sex Before and After Being Given Sex Education Through VR

| Adolescent Attitudes | Pretest | | Posttest | |
|---|---|---|---|---|
| | f | % | f | % |
| Negative | 48 | 60.0 | 26 | 32.5 |
| Positive | 32 | 40.0 | 54 | 67.5 |

Table 2, the pretest results describe adolescents' attitudes at SMAN 14 Ambon prior to receiving sexual education on behaviors leading to free sex. The majority of respondents demonstrated negative attitudes toward such behaviors, totaling 48 respondents (60.0%), while the remaining 32 respondents (40.0%) showed positive attitudes. The posttest results reflect adolescents' attitudes at SMAN 14 Ambon after receiving sexual education on behaviors leading to free sex. Most respondents exhibited positive attitudes toward free-sex behavior, accounting for 54 respondents (67.5%), whereas 26 respondents (32.5%) still demonstrated negative attitudes toward behaviors leading to free sex.

Table 3.
Adolescent Behaviors That Lead to Free Sex Before and After Being Given Sex Education Through VR

| Adolescent Behavior | Pretest | | Posttest | |
|---|---|---|---|---|
| | f | % | f | % |
| Risky | 45 | 56.2 | 25 | 31.2 |
| No Risk | 35 | 43.8 | 55 | 68.8 |

Table 3, the pretest results describe adolescents' behaviors at SMAN 14 Ambon prior to receiving sexual education on behaviors leading to free sex. The findings indicate that the majority of adolescents engaged in risky behaviors associated with free sex, with 45 respondents (56.2%), while 35 respondents (43.8%) did not engage in such risky behaviors. The posttest results illustrate adolescents' behaviors at SMAN 14 Ambon after receiving sexual education on behaviors leading to free sex. Most respondents no longer engaged in risky behaviors related to free sex following the intervention, totaling 55 respondents (68.8%), whereas 25 respondents (31.2%) continued to exhibit risky behaviors.

Table 4.
Influence before and after Sex Education on the Knowledge

| Test | n | Descriptive Statistics | | Paired T-Test | | |
|---|---|---|---|---|---|---|
| | | Mean | Std.D | t | df | Sig, (2-tailed) |
| Pre Test | 80 | 1.39 | .490 | -2.545 | 79 | 0,013 |
| Post Test | 80 | 1.64 | .484 | | | |

The results of the paired-sample t-test on the knowledge variable regarding adolescent behaviors leading to free sex before and after sexual education showed that the pretest mean score was 1.39, while the posttest mean score increased to 1.64. The analysis yielded a p-value of 0.013 with a t-value of −2.545. These findings indicate that the alternative hypothesis ($H_1$) was accepted and the null hypothesis ($H_0$) was rejected, demonstrating a significant effect of the use of VIRASAT (Virtual Reality Sexual Education) media on adolescents' knowledge related to behaviors leading to free sex at SMAN 14 Ambon.

Table 5.
Influence before and after Sex Education on the Attitude

| Test | n | Descriptive Statistics | | Paired T-Test | | |
|---|---|---|---|---|---|---|
| | | Mean | Std.D | t | df | Sig, (2-tailed) |
| Pre Test | 80 | 1.40 | .493 | -2.872 | 79 | 0,005 |
| Post Test | 80 | 1.68 | .471 | | | |

The results of the paired-sample t-test on adolescents' attitudes toward behaviors leading to free sex before and after VR-based sexual education showed that the pretest mean score was 1.40, while the posttest mean score increased to 1.68. The analysis yielded a p-value of 0.005 with a t-value of −2.827. These results indicate that the alternative hypothesis ($H_1$) was accepted and the null hypothesis ($H_0$) was rejected, demonstrating a significant effect of the use of VIRASAT (Virtual Reality Sexual Education) media on adolescents' attitudes toward behaviors leading to free sex at SMAN 14 Ambon.

Table 6.
Effects before and after Sex Education on Student Behavior

| Test | N | Statistika Deskriptif | | Paired T-Test | | |
|---|---|---|---|---|---|---|
| | | Mean | Std.D | t | df | Sig, (2-tailed) |
| Pre Test | 80 | 1.44 | .499 | -2.963 | 79 | 0,004 |
| Post Test | 80 | 1.69 | .466 | | | |

The results of the paired-sample t-test on adolescents' behaviors related to free sex before and after VR-based sexual education showed that the pretest mean score was 1.44, while the posttest mean score increased to 1.69. The analysis yielded a p-value of 0.004 with a t-value of −2.963. These findings indicate that the alternative hypothesis ($H_1$) was accepted and the null hypothesis ($H_0$) was rejected, demonstrating a significant effect of the use of VIRASAT (Virtual Reality Sexual Education) media on adolescents' behaviors leading to free sex at SMAN 14 Ambon.

## DISCUSSION

### Effect of VIRASAT on Adolescents' Knowledge Related to Free Sex

Knowledge represents the result of sensory perception and experience acquired by individuals and serves as a fundamental domain influencing health-related behavior. In the context of sexual education, adolescents' level of knowledge reflects their understanding of sexuality and reproductive health, which directly affects their awareness and decision-making regarding sexual behavior. The findings of this study indicate that prior to the intervention, the majority of respondents at SMAN 14 Ambon had low levels of knowledge regarding sexual education. This condition is likely attributed to limited access to reliable information, low interest in seeking sexual health information through media sources, and the persistent taboo surrounding sexual education in the school environment. Such limitations may increase adolescents' vulnerability to engaging in behaviors leading toward free sex, including physical intimacy and unsafe sexual practices.

Following the implementation of VIRASAT, a substantial increase in knowledge levels was observed, with most respondents demonstrating high knowledge scores. Statistical analysis using the paired-sample t-test confirmed a significant difference between pretest and posttest knowledge scores ($p = 0.013$), indicating that VR-based sexual education effectively enhanced adolescents' understanding of sexual health issues. This improvement may be attributed to the immersive and interactive nature of VR, which provides realistic simulations of risky sexual behaviors and their consequences, including sexually transmitted infections, unintended pregnancy, and social stigma. These findings are consistent with the principles of health education, which emphasize education as a key factor in promoting knowledge and shaping healthy behavior. Sexual education, as part of health education, aims to enhance understanding of biological, psychological, and social aspects of sexuality (Santrock, 2019). Technology-based educational media, particularly VR, have been identified as effective alternatives for improving learning outcomes by increasing engagement and comprehension (Rosen et al., 2021).

The observed increase in knowledge aligns with the Cognitive Theory of Multimedia Learning, which posits that information presented through integrated visual and auditory channels is more effectively processed, retained, and applied (Safitri et al., 2022). Moreover, knowledge acquisition is strongly influenced by sensory stimulation, particularly when multiple senses are engaged simultaneously (Ridwan et al., 2020). Therefore, VR-based education offers a pedagogically sound approach to delivering sexual education to adolescents.

**Effect of VIRASAT on Adolescents' Attitudes Toward Free Sex**

Attitude reflects an individual's predisposition to respond positively or negatively toward a particular object or situation and plays a crucial role in shaping behavior. Before the intervention, most respondents exhibited negative attitudes toward sexual health issues, likely due to insufficient knowledge and limited exposure to accurate sexual education. After the VR-based intervention, a significant improvement in adolescents' attitudes was observed, with the majority demonstrating positive attitudes toward preventing free sexual behavior. The paired-sample t-test showed a statistically significant effect of VIRASAT on attitudes ($p = 0.005$). This shift suggests that VR-based sexual education not only enhances knowledge but also influences emotional and cognitive responses, leading to more favorable attitudes toward healthy sexual behavior.

Attitude formation is influenced by several factors, including knowledge, education, age, and experience. The immersive learning experience provided by VR allows adolescents to personally engage with realistic scenarios, making the educational content more meaningful and emotionally impactful. Exposure to simulated consequences of risky sexual behavior, such as unintended pregnancy and STIs, encourages the development of preventive attitudes. These findings are supported by behavioral theories suggesting that personal experience and media exposure significantly shape attitudes. VR-based education offers a controlled yet realistic learning environment that fosters awareness, reflection, and motivation to adopt healthier attitudes toward sexuality.

**Effect of VIRASAT on Adolescents' Sexual Behavior**

Behavior represents an individual's observable actions and activities in response to internal and external stimuli. Prior to the intervention, more than half of the respondents reported engaging in risky behaviors related to free sex. This behavior may be influenced by inadequate knowledge, weak self-control, peer pressure, curiosity, and sociocultural norms that discourage open discussions about sexuality. Following the VIRASAT intervention, a marked reduction in risky sexual behavior was observed, with the majority of adolescents exhibiting non-risky behavior. The paired-sample t-test revealed a statistically significant difference between pretest and posttest behavior scores ($p = 0.004$), indicating that VR-based sexual education effectively influenced behavioral change. This behavioral change may be explained by increased awareness of health risks, improved attitudes, and

external factors such as school regulations and normative guidance from teachers. VR-based education aligns well with the learning preferences of Generation Z adolescents, who are highly familiar with digital and interactive technologies.

The findings are consistent with the Theory of Planned Behavior, which suggests that behavior is shaped by intention formed through knowledge, attitudes, subjective norms, and perceived behavioral control. Additionally, the Health Belief Model supports these results, as VR-based education increases perceived susceptibility and severity of sexual health risks while emphasizing the benefits of preventive behavior (Fransiska et al., 2022). Previous studies have also demonstrated that VR-based interventions positively influence behavior change in health education contexts (Bailey et al., 2019; Miller et al., 2021). By reducing curiosity-driven experimentation and enhancing decision-making skills, VR serves as an effective tool for promoting responsible sexual behavior among adolescents. The findings suggest that VIRASAT effectively improves adolescents' knowledge, attitudes, and behaviors related to free sex. Behavioral change observed in this study reflects the combined influence of internal factors, such as increased awareness and motivation, and external factors, including social norms, educational support, and cultural values. These results highlight the potential of VR-based sexual education as an innovative and effective strategy for preventing risky sexual behavior among adolescents.

## CONCLUSION

This study demonstrates that the use of VIRASAT (Virtual Reality Sexual Education) media has a significant effect on adolescents' knowledge, attitudes, and behaviors related to free sex at SMAN 14 Ambon. The VR-based intervention effectively increased adolescents' level of knowledge, fostered more positive attitudes toward healthy sexual behavior, and reduced risky sexual behaviors. These findings highlight the potential of immersive and interactive learning through virtual reality to enhance adolescents' understanding of sexual health and support preventive behavioral change. Therefore, VIRASAT may serve as an innovative and effective approach for school-based sexual education programs, particularly in addressing sensitive topics and promoting responsible sexual behavior among adolescents.

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