Understanding Adolescent Risk Behaviors: Insights from a School-Based Health Student Survey

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Abstract. Adolescence is a critical phase for establishing lifelong health behaviors; however, its often marked by risky practices that face significant health problems. This study explored the prevalence of risky health behaviors among 252 high school students aged 15–18 years using the Global School-Based Student Health Survey (GSHS). This survey assesses reproductive health awareness, smoking habits, HIV/AIDS knowledge, and physical activity. The results revealed that over half (53%) of the students lacked basic awareness of reproductive health, including safe practices and risk identification. Smoking behavior was reported by 19% of students, with some initiating as early as age 10 years old, influenced significantly by peer pressure. Less than 40% of students understanding about HIV/AIDS transmission and prevention. Furthermore, physical inactivity was prevalent, with more than 60% of students engaging in less than the recommended 60 minutes of daily physical activity. These results highlight critical deficiencies in adolescent health knowledge and behaviors, emphasizing the need for targeted, school-based health education programs. Comprehensive initiatives focusing on reproductive health, smoking prevention, HIV/AIDS awareness, and physical activity promotion are essential to empower students to make informed choices and adopt healthier lifestyles, reducing their long-term health risks.

1 Introduction

Adolescents often face unique challenges that place them at heightened risk for various health-related behaviours, including reproductive health issues, substance use, and physical inactivity. Adolescent risky behaviour is influenced by a number of factors, including peer group influence, parent-adolescent relationships, socio-demographic factors, single-parent families and adolescents with parents who abuse drugs or alcohol, and other unexplained factors [1–4].

Globally, the data of Health Behavior in School-aged Children Study (HBSC) survey covering 43 European countries revealed that approximately 16.6% of male and 14.3% of female adolescents exhibit moderate to high-risk behavior patterns, including alcohol use,

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smoking, and aggressive acts [5]. Similarly, a study in Korea found that 6.4% of male and 3.8% of female adolescents engaged in multiple risk behaviors simultaneously, with factors such as poor mental health, older age, and social environment influencing these behaviors [4]. In Indonesia, although detailed data on adolescent risk behavior prevalence is limited, trends in substance use, early marriage, and low physical activity reflect similar concerns. Socio-demographic factors, such as education levels, socioeconomic status, and access to health information, contribute to these risks [6]. These risk behaviors not only have immediate impacts but also set the stage for long-term health outcomes. School-based health surveys provide critical insights into these behaviors, offering valuable data to inform interventions and policies aimed at improving adolescent health.

Reproductive health remains a priority, with adolescents experiencing barriers to sexual education and healthcare services. A lack of knowledge and access has been linked to increased rates of unintended pregnancies and sexually transmitted infections (STIs), including HIV/AIDS [7]. Smoking, despite declining trends, continues to pose a significant threat due to the rising prevalence of alternative nicotine products, such as e-cigarettes [8]. Physical inactivity among adolescents, influenced by social and environmental factors, is another area of concern, as it contributes to a range of health risks, including obesity and cardiovascular disease [8].

In Indonesia, cultural and systemic barriers further exacerbate these issues. Limited access to sexual education and entrenched stigmas around reproductive health create significant gaps in knowledge among adolescents [9]. Smoking initiation, often beginning as early as age 10, is heavily influenced by peer pressure and societal norms [10]. Similarly, physical inactivity reflects broader societal shifts toward sedentary lifestyles and limited access to structured physical education programs. Therefore, this study assesses the prevalence of risky health behaviors among adolescents and contextualizes the findings within local and global frameworks to inform culturally relevant interventions.

2 Methods and materials

2.1 Study Design

A cross-sectional descriptive study was conducted to evaluate the prevalence of risk behaviors among high school students aged 15–18 years. The Global School-Based Student Health Survey (GSHS) guidelines was used to validated core and expanded question modules to ensure data quality and comparability.

2.2 Setting and Participants

The study was conducted in one of high school in Pekalongan, Central Java, Indonesia. A stratified random sampling technique was employed to ensure proportional representation across grades and gender. A total of 252 students were selected, representing the broader adolescent population in similar school settings.

2.3 Instruments

The GSHS 2021 core-expanded question modules were adapted to suit the local context, focusing on four domains: 1) Reproductive health awareness; the questions assessed knowledge of safe practices, understanding of sexually transmitted infections, and access to reproductive health resources; 2) Tobacco use; the questions captured smoking prevalence, age of initiation, and exposure to second-hand smoke; 3) HIV/AIDS knowledge; the

questions focused on modes of transmission, prevention strategies, and stigma; 4) Physical activity; the questions evaluated levels of physical activity, sedentary behaviors, and barriers to exercise.

The GSHS is a globally recognized instrument developed collaboratively by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC). It is designed to provide reliable and comparable data on health behaviors and protective factors among adolescents. The instrument underwent rigorous expert review during its development to ensure its relevance and appropriateness for assessing adolescent health behaviors across different cultures and settings. For this study, minor cultural and language adaptations were made, followed by a back-translation process to maintain the integrity of the items. The survey modules have been validated in multiple international studies, demonstrating their ability to measure the intended constructs effectively. Items were grouped under specific behavioral domains based on theoretical frameworks and previous empirical studies. The GSHS has demonstrated high reliability across diverse populations, with Cronbach's alpha values exceeding 0.7 in most domains. For this study, a pilot test was conducted with 30 students outside the study sample. The reliability of the adapted instrument was assessed, yielding acceptable Cronbach's alpha values for each domain; reproductive health awareness (0.81), tobacco use (0.78), HIV/AIDS knowledge (0.83), and physical activity (0.75).

2.4 Data Collection Procedures

Data were collected using self-administered questionnaires during scheduled sessions within the school premises. Students were briefed about the study's objectives and provided with instructions to ensure accurate responses. Trained researchers were present to clarify any doubts without influencing the participants' answers.

2.5 Ethical Considerations

Ethical approval was obtained from the Faculty of Health Sciences Ethics Committee at Universitas Pekalongan. Written informed consent was secured from students and their guardians before participation. Anonymity and confidentiality were strictly maintained throughout the research process.

2.6 Data Analysis

Descriptive statistics, including frequencies and percentages, were computed to summarize participant characteristics and prevalence rates for each behavioral domain. The analysis aimed to identify patterns and gaps in health knowledge and practices among adolescents.

3 Results and discussion

3.1 Result

The findings of this study provide insights into the demographic characteristics of respondents and their behaviors related to reproductive health, smoking, HIV/AIDS knowledge, and physical activity.

Table 1. Summary of Respondents' Characteristics and Health Behaviors

Variable	Category	Frequency	Percentage (%)
Age (years)	15	80	31.7
	16	90	35.7
	17	70	27.8
	18	12	4.8
Gender	Male	100	39.7
	Female	152	60.3
Reproductive Health Awareness	Basic awareness	119	47.2
	Lack of awareness	133	52.8
Smoking Behavior	Non-smokers	203	80.6
	Smokers	49	19.4
HIV/AIDS Knowledge	Good awareness	100	39.7
	Limited awareness	152	60.3
Physical Activity	Active (≥60 mins/day)	101	40.1
	Inactive (<60 mins/day)	151	59.9

Table 1 showed that the most respondents were aged 15 (31.7%) and 16 years (35.7%), with smaller proportions aged 17 (27.8%) and 18 years (4.8%). Female students comprised 60.3% of the sample, while males accounted for 39.7%. In terms of reproductive health awareness, 47.2% of students demonstrated basic awareness, while 52.8% lacked adequate knowledge.

For smoking behavior, 19.4% of respondents reported being smokers, whereas 80.6% identified as non-smokers. Regarding HIV/AIDS knowledge, 39.7% of students displayed good awareness, while 60.3% had limited knowledge. Physical activity data revealed that 40.1% of students were physically active (engaging in ≥60 minutes per day), whereas 59.9% were classified as inactive.

3.2 Discussion

The findings from school-based health surveys underscore the complex interplay of social, behavioral, and environmental factors shaping adolescent health. These results align with global evidence emphasizing the importance of integrated approaches that address multiple risk factors simultaneously.

3.2.1 Reproductive Health

Over half of the adolescents in this study lacked basic reproductive health awareness. This finding consistent with other studies that highlight the barriers posed by inadequate education and healthcare access. Tailored educational programs addressing misconceptions and reducing stigma around sexual health are essential. Peer education programs have demonstrated promise in improving knowledge and attitudes, though their impact on behavior change remains mixed [7].

One of the main factors contributing to low awareness is the limited availability of comprehensive sexual education. According to the World Health Organization (WHO), comprehensive sexual education plays a pivotal role in promoting healthy behaviors, preventing sexually transmitted infections (STIs), and reducing unintended pregnancies among adolescents (WHO, 2018). In many settings, however, sex education is either insufficient or not provided at all, leading to misconceptions and inadequate understanding of reproductive health [11].

Furthermore, cultural taboos and societal stigma surrounding discussions of sexuality and reproductive health often prevent adolescents from seeking information. In some cultures, discussions about sex are considered inappropriate, which makes it difficult for

young people to learn about their bodies and sexual health in an open, supportive environment [12]. This lack of open communication exacerbates the gap in reproductive health knowledge, as adolescents may rely on peers or unreliable sources for information.

The consequences of low awareness are significant. Adolescents with limited knowledge about reproductive health are more likely to engage in risky behaviors such as unprotected sex, increasing their susceptibility to sexually transmitted infections (STIs) and unintended pregnancies [13]. Additionally, inadequate knowledge about contraception and reproductive anatomy can lead to poor decision-making and long-term health complications [14].

Efforts to address these issues must include improving access to accurate, age-appropriate information. Schools, parents, and communities must work together to provide comprehensive and culturally sensitive sexual education that addresses the diverse needs of adolescents. Research suggests that when adolescents receive proper reproductive health education, they are better equipped to make informed decisions and protect their health [15]. In conclusion, the low awareness of reproductive health among adolescents, as evidenced by the 52.8% finding in this study, highlights the urgent need for targeted interventions. Increasing awareness through comprehensive education, open dialogue, and accessible resources is essential to empowering young people to make informed decisions about their sexual and reproductive health.

3.2.2 Smoking and Substance Use

Smoking prevalence among the surveyed adolescents mirrors broader regional trends, with early initiation influenced by peer dynamics and social acceptability [10]. Policies restricting marketing and access to nicotine products, combined with school-based awareness campaigns, are critical for addressing the rise in e-cigarette use [8].

The prevalence of smoking among Indonesian adolescents aligns with trends observed in other parts of the world. For example, a study conducted in the United States found that approximately 8.5% of high school students were smokers in 2021, indicating a slightly lower prevalence but still highlighting the need for interventions [16]. In Indonesia, the smoking rate among adolescents may be attributed to peer pressure, cultural acceptance of tobacco use, and targeted marketing by tobacco companies, as identified by a study in Southeast Asia [17]. Smoking prevention efforts should focus on educating adolescents about the health risks and implementing stricter regulations regarding tobacco sales and marketing to young people [18].

3.2.3 Knowledge of HIV/AIDS

A staggering 60.3% of students in this study were found to have limited knowledge about HIV/AIDS, which poses a serious public health concern. Comprehensive sexual education is critical in addressing knowledge gaps and preventing the spread of HIV [19]. Globally, young people are often the most vulnerable to HIV, with suboptimal levels of education and awareness contributing to high-risk behaviors [17]. For example, a study conducted in Kenya found that adolescents with limited knowledge of HIV/AIDS were more likely to engage in unprotected sex, leading to a higher risk of HIV transmission [20]. In Indonesia, similar gaps in knowledge may be exacerbated by cultural taboos surrounding sexual health and insufficient sexual education in schools [17]. Public health initiatives should prioritize educating students on HIV prevention, safe sexual practices, and the importance of early testing. School-based programs that incorporate peer education and community involvement may be particularly effective in increasing knowledge and reducing stigma.

3.2.4 Physical Inactivity

Physical inactivity, affecting more than 60% of respondents, highlights the urgent need for structured interventions promoting regular exercise. School-based and community initiatives can play a pivotal role in mitigating the health risks associated with sedentary behaviors, fostering lifelong healthy habits [8]. The high percentage of students (59.9%) classified as physically inactive is another alarming finding. Physical inactivity is a major risk factor for obesity, cardiovascular diseases, and mental health issues in adolescence [21]. Globally, the World Health Organization (WHO) has warned that physical inactivity is one of the leading causes of death and disability, contributing to the global burden of diseases [22]. In the Indonesian context, this sedentary behavior is likely influenced by a combination of factors, including the increasing use of digital devices, limited access to safe recreational spaces, and an educational system that prioritizes academic performance over physical activity [23]. To combat this trend, policies promoting regular physical activity in schools are essential. Schools should encourage daily physical education classes, outdoor activities, and sports programs that can motivate students to stay active and improve their overall health.

3.2.5 Contextual Factors in Indonesia

Local cultural and systemic challenges significantly shape adolescent behaviors. For instance, strong parental attachment has been shown to mediate risk behaviors effectively, as families remain primary influencers during adolescence. Similarly, media exposure-both a risk factor and a potential educational tool-requires careful regulation to ensure adolescents receive accurate and empowering information [9].

Efforts to address these issues must prioritize culturally sensitive, evidence-based practices. By leveraging insights from school-based health surveys, stakeholders can design targeted interventions that resonate with the unique needs of diverse adolescent populations.

4 Conclusions and suggestions

This study highlights critical deficiencies in adolescent health knowledge and behaviors within the Indonesian context. Comprehensive, culturally sensitive interventions that address reproductive health, smoking prevention, and physical inactivity are essential for fostering healthier adolescent populations. By integrating data from health surveys and local research, policymakers can develop targeted programs to mitigate risk behaviors and improve long-term health outcomes.

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