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Knowledge and Smoking Behavior Among High School Students : A Cross-Sectional Study

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INTRODUCTION

Smoking is commonly understood as the habit of using tobacco cigarettes wrapped in paper or natural leaves, which are lit and then inhaled.

This behavior is frequently encountered in everyday life, both in public spaces and within home environments. The effects of smoking are not limited to the individual who smokes; people nearby may also be affected through exposure to

secondhand smoke. From a behavioral perspective, smoking involves burning a cigarette, drawing the smoke into the lungs, and releasing it back into the air, allowing others in the surrounding area to inhale it unintentionally, as noted by Elon and Malinti (1)

Smoking behavior has gradually become embedded in everyday social life in Indonesia. Individuals of different age groups, including adolescents, adults, and even children, are no longer unfamiliar with cigarettes, despite their well-recognized health risks (2). Among adolescents in particular, smoking is frequently observed in many settings, such as small shops near schools, during the commute to school, at bus stops, inside private vehicles, on public transportation, and within the home environment. Over time, this behavior has come to be viewed as ordinary and often goes unnoticed by the broader community. This normalization occurs even though smoking poses serious health threats, not only to adolescents themselves but also to those around them who are exposed to cigarette smoke (3)

Efforts to prevent smoking behavior among adolescents can be directed toward improving their knowledge and awareness of the health risks associated with tobacco use and the harmful consequences that may arise from this habit (4). Enhancing access to accurate information is an important strategy and can be achieved through educational activities or counseling programs that clearly explain the adverse effects of smoking on health. Such approaches are considered effective in shaping adolescents' attitudes and supporting healthier behavioral choices, as described by Smp and Matutina (5)

Data from the World Health Organization (2020) indicate that tobacco use affects 22.3% of the global population, with a substantially higher proportion among men (36.7%) compared to women (7.8%). More than 80% of tobacco users live in low- and middle-income countries (6). In Indonesia, the prevalence of smoking among adult men reached 62.9%, placing the country third worldwide after India and China. Smoking among adolescents aged 10–18 years also showed an upward trend, increasing from 7.2% in 2013 to 9.1% in 2018 (7). The ASEAN Tobacco Report Card (2018) reported that Indonesia has approximately 65 million adult smokers, representing 36.3% of the population, the highest proportion in Southeast Asia. Furthermore, data from the National Socioeconomic Survey

(Susenas, 2020) revealed that West Java recorded the highest smoking prevalence among individuals aged 1–24 years, at 23.6%. In Bekasi Regency, 21.2% of adolescents and young people in the 1–24 year age group were identified as active smokers, with 24.9% reporting daily smoking and 7% smoking occasionally. In addition, a survey conducted using a Google Form distributed on January 31, 2025, at SMA Negeri 3 Tambun Selatan found that 242 students were smokers, corresponding to a prevalence of 53.8% (8).

Cigarettes contain nicotine, even in relatively small amounts, which can interfere with respiratory function and increase the likelihood of developing serious health conditions (9). Prolonged exposure to nicotine and other harmful substances in cigarettes has been associated with a higher risk of cardiovascular disease, including heart attacks and strokes, as well as cancer and reproductive disorders such as impotence (10). Knowledge develops through an individual's desire to understand their surroundings and is shaped by experiences gained from observing or perceiving objects and events. This process of knowing involves the use of the five sensory modalities vision, hearing, smell, taste, and touch—which together enable a person to interpret and make sense of information from the environment (11)

The purpose of this research is to gain a comprehensive understanding of smoking behavior among adolescents and the factors that contribute to its persistence in everyday life. Specifically, the study aims to examine how individual habits, levels of knowledge, attitudes toward smoking, and environmental influences interact in shaping adolescents' smoking behavior. By identifying these factors, the research seeks to provide a clearer picture of why smoking remains common among young people despite widespread information about its health risks. In addition, this study aims to assess the extent to which adolescents' awareness of the dangers of smoking influences their attitudes and behaviors. Another important objective is to explore the role of social and environmental support such as family, peers, and community norms in either encouraging smoking or supporting smoking prevention efforts. Ultimately, the findings of this research are expected to serve as a basis for developing more effective health education, counseling, and intervention programs aimed at preventing

smoking initiation and promoting healthier lifestyles among adolescents (12).

METHODS

Study Design

This study employed a quantitative research approach using a descriptive cross-sectional design. The cross-sectional method was selected to capture data on students' smoking behavior and knowledge at a single point in time, allowing the researcher to describe the current situation without manipulating variables. This design is appropriate for identifying the prevalence of smoking behavior and associated knowledge levels among adolescents within a defined population.

Population and Sample

The study population consisted of adolescent students enrolled at State Senior High School 3 Tambun Selatan. From this population, 440 students participated in the study. The sample size was determined based on predefined inclusion and exclusion criteria established by the researcher to ensure that participants met the characteristics relevant to the study objectives. All eligible students who agreed to participate during the data collection period were included in the analysis.

Research Instrument

Data were collected using a structured questionnaire administered online through Google Forms. The questionnaire was developed to obtain information relevant to the study variables and consisted of three sections:

- Knowledge questionnaire, comprising 10 questions, designed to measure students' understanding of smoking and its health risks.
- Smoking behavior questionnaire, consisting of one question to identify whether respondents engaged in smoking-related behaviors.
- Smoking incidence questionnaire, consisting of one question aimed at determining students' smoking experience or status.
- The online format was chosen to enhance efficiency, facilitate access, and ensure ease of data management.

Data Collection Procedure

Data collection was conducted over a three-month period, from November 31, 2024, to

January 31, 2025. During this period, the Google Form questionnaire was distributed to students who met the study criteria. Participants completed the questionnaire independently and voluntarily. Responses were recorded automatically in the Google Forms system, minimizing data entry errors and ensuring data completeness.

Data Analysis

The collected data were analyzed using descriptive statistical methods. The analysis focused on calculating frequencies and percentages to describe students' levels of knowledge, smoking behavior, and smoking incidence. The results were presented in tabular and narrative forms to provide a clear overview of the distribution of variables within the study population.

Ethical Considerations

This research adhered to established ethical principles in human subject research. Ethical approval was obtained from the Research Ethics Committee of Muhammadiyah University of Purwokerto, with registration number KEPK/UMP/213/I/2025. Prior to participation, students were informed about the purpose of the study, and their participation was voluntary. Confidentiality and anonymity of all respondents were strictly maintained throughout the research process.

RESULTS

Table 1 shows the age distribution of the respondents. Most participants were 16 years old, totaling 160 students (36.4%). This was followed by students aged 17 years with 127 respondents (28.9%) and those aged 18 years with 115 respondents (26.1%). The smallest proportion was found among students aged 15 years, accounting for 38 respondents (8.6%).

As presented in Table 2, more than half of the respondents were enrolled in grade 12, with 231 students (52.5%). Grade 11 students represented 138 respondents (31.4%), while grade 10 students accounted for the smallest proportion at 71 respondents (16.1%).

Table 3 indicates that the majority of respondents had a poor level of knowledge regarding smoking, with 258 students (58.6%). Meanwhile, 182 respondents (41.4%) demonstrated a moderate level of knowledge.

Table 4 shows that more than half of the respondents reported smoking behavior. A total of 245 students (55.7%) indicated that they smoked, while 195 students (44.3%) stated that they did not engage in smoking.

Table 5 illustrates that 236 respondents (53.6%) had experienced smoking, whereas 204 respondents (46.4%) reported no history of smoking.

Table 6 demonstrates a statistically significant association between knowledge level and smoking incidence among students ($p = 0.000$).

The majority of respondents with poor knowledge reported smoking (83.3%). In contrast, most respondents with a moderate level of knowledge did not smoke (88.5%).

As shown in Table 7, smoking behavior was significantly associated with smoking incidence ($p = 0.000$). The majority of respondents who did not smoke also reported no smoking incidence (90.8%). Conversely, most respondents who reported smoking behavior had experienced smoking incidence (89.0%).

Table 1. Distribution of Respondents by Age at State Senior High School 3 Tambun Selatan

Age (Years)	Frequency (f)	Percentage (%)
15	38	8.6
16	160	36.4
17	127	28.9
18	115	26.1
Total	440	100.0

Table 2. Distribution of Respondents by Class Level

Class Level	Frequency (f)	Percentage (%)
Grade 10	71	16.1
Grade 11	138	31.4
Grade 12	231	52.5
Total	440	100.0

Table 3. Distribution of Respondents by Level of Knowledge

Level of Knowledge	Frequency (f)	Percentage (%)
Poor	258	58.6
Moderate	182	41.4
Total	440	100.0

Table 4. Distribution of Respondents by Smoking Behavior

Smoking Behavior	Frequency (f)	Percentage (%)
Do not smoke	195	44.3
Smoke	245	55.7
Total	440	100.0

Table 5. Distribution of Respondents by Smoking Incidence

Smoking Incidence	Frequency (f)	Percentage (%)
No	204	46.4
Yes	236	53.6
Total	440	100.0

Table 6. Relationship Between Knowledge Level and Smoking Incidence

Knowledge Level	No Smoking n (%)	Smoking n (%)	Total	p-value
Poor	43 (16.7%)	215 (83.3%)	258	0.000
Moderate	161 (88.5%)	21 (11.5%)	182	
Total			440	

Table 7. Relationship Between Smoking Behavior and Smoking Incidence

Smoking Behavior	No Smoking n (%)	Smoking n (%)	Total	p-value
Do not smoke	177 (90.8%)	18 (9.2%)	195	0.000
Smoke	27 (11.0%)	218 (89.0%)	245	
Total			440	

DISCUSSION

Respondent Characteristics

The findings indicate that most respondents were between 16 and 18 years of age, with the largest proportion being 16 years old. This age range represents middle to late adolescence, a developmental stage characterized by increased curiosity, identity formation, and a higher tendency to experiment with risk-related behaviors, including smoking. The predominance of students from grade 12 further suggests that prolonged exposure to peer influence and social environments may increase opportunities for smoking behavior as students advance in their academic levels (13,14).

Knowledge Level Related to Smoking

A substantial proportion of respondents demonstrated a low level of knowledge regarding the risks associated with smoking. This finding suggests that health-related information about the harmful effects of tobacco may not be adequately understood or internalized by students. Limited knowledge can reduce adolescents' perception of risk, leading them to view smoking as a normal or acceptable behavior. Insufficient awareness may also impair their ability to make informed decisions related to their health (15).

Smoking Behavior and Smoking Incidence

The results revealed that more than half of the respondents reported smoking behavior and had experienced smoking. This indicates that smoking remains a prevalent issue among high school students. The normalization of smoking within adolescents' social environments, including school and community settings, may contribute to the high prevalence observed. In

addition, easy access to cigarettes and weak social control may further reinforce smoking initiation and continuation among adolescents (16).

Relationship Between Knowledge and Smoking Incidence

The analysis showed a statistically significant relationship between knowledge level and smoking incidence. Most respondents with low knowledge levels reported smoking, whereas the majority of students with moderate knowledge did not smoke. This finding highlights the important role of knowledge in shaping health-related behaviors. Adolescents who are more aware of the negative consequences of smoking are more likely to avoid or resist smoking behavior (17,18).

Relationship Between Smoking Behavior and Smoking Incidence

A significant association was also found between smoking behavior and smoking incidence. Students who reported non-smoking behavior were predominantly free from smoking incidence, while those who engaged in smoking behavior were highly likely to report having smoked. This result indicates that established behavioral patterns strongly influence smoking incidence. Such behaviors may be shaped by personal habits, peer influence, and environmental acceptance of smoking (19,20).

Research Implications

The results of this study emphasize the need for comprehensive health education programs focused on smoking prevention within school settings. Interventions that aim to improve adolescents' knowledge and awareness may help

reduce smoking prevalence. Moreover, collaboration between schools, families, and communities is essential to create supportive environments that discourage smoking behavior among adolescents.

CONCLUSION

This study demonstrates that smoking remains a common behavior among adolescents at State Senior High School 3 Tambun Selatan. More than half of the students reported smoking behavior and smoking incidence, indicating that tobacco use is still widely practiced among high school students. The findings also reveal that a large proportion of respondents have a low level of knowledge regarding the dangers of smoking.

Statistical analysis showed a significant relationship between knowledge level and smoking incidence, suggesting that insufficient understanding of smoking risks is associated with a higher likelihood of smoking. In addition, a strong association was found between smoking behavior and smoking incidence, indicating that established behavioral patterns play a crucial role in smoking initiation and continuation among adolescents.

Overall, the results highlight that limited knowledge and unfavorable behavioral patterns contribute substantially to smoking incidence in adolescents. These findings underscore the importance of preventive strategies that address both cognitive and behavioral aspects of smoking among young people.

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Author Contributions

All authors contributed to the study conception and design. Data collection and instrument preparation were conducted by the primary

author. Data analysis and interpretation were carried out collaboratively by all authors. The initial draft of the manuscript was written by the primary author, and all authors reviewed, revised, and approved the final version of the manuscript for publication.

Conflict of Interest

The authors declare that there are no conflicts of interest related to this study.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request, in accordance with ethical and privacy considerations.

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