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Adapting the Theory of Planned Behavior to Analyze Smoking Intentions Among Adolescents in Urban School

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ABSTRACT

Introduction: The prevalence of smoking among adolescents continues to increase each year. The Theory of Planned Behavior states that behavior is preceded by intention.

Objective: This study aims to identify the factors associated with and most dominant in influencing smoking intentions among adolescents.

Method: This research is quantitative with a cross-sectional study design. The study was conducted at State Junior High School 3 in South Tangerang City, which is located in an urban area. The research sample consisted of 276 adolescents who were non-active smokers, selected using a proportional stratified sampling technique, and data collection was carried out through a questionnaire. Data analysis included univariate analysis, bivariate analysis using the chi-square test, and multivariate analysis using multiple logistic regression.

Result: The results showed that most adolescents had strong smoking intentions (56.5%), supportive attitudes toward smoking (52.2%), negative subjective norms (54.7%), and weak perceived control over smoking behavior (55.8%). There was a significant relationship between smoking attitudes (PR=2.658; 95% CI=2.028-3.485; P<0.05), subjective norms (PR=3.338; 95% CI=2.439-4.568; P<0.05), and perceived control over smoking behavior (PR=2.739; 95% CI=2.046-3.666; P<0.05) with smoking intention. Subjective norms were identified as the dominant variable influencing the intention.

Conclusion: There is a relationship between attitude, subjective norm, and perceived behavioral control with respect to smoking intention, with subjective norm being the dominant variable influencing intention. Therefore, it is essential to intensify peer education programs to influence peers to avoid smoking, as well as to conduct a deeper analysis of the factors shaping subjective norms and design school-based interventions specifically targeting changes in these norms.

Keywords: Smoking Intention; Theory of Planned Behavior; Adolescents

INTRODUCTION

The Basic Health Research (RISKESDAS) data shows an increase in the prevalence of smoking among adolescents aged 10-18 years, from 7.20% in 2013 to 9.10% in 2018 (1). Predictions indicate that without intervention, this figure could reach 45% by 2025 (2). Furthermore, National Development Planning Agency of the Republic of Indonesia (BAPPENAS) estimates that the prevalence of smokers aged 10-18 years will reach 16% by 2030 (3). Banten Province has the highest percentage of daily smokers in Indonesia, at 26.8%, with South Tangerang City showing an increase in the percentage of adolescents starting to smoke at ages 10-14, or early adolescence, from 11.8% in 2013 to 29.37% in 2018 (4). This phenomenon is supported by research indicating that adolescents start smoking as early as elementary and junior high school (5).

Smoking behavior among adolescents is a social issue that is often overlooked. Social environmental factors, particularly peer influence, are significant triggers for smoking behavior (6). Additionally, the more friends who smoke, the more likely an adolescent is to smoke (7). The increasing prevalence of smoking among early adolescents is due to significant transformations occurring during this age, both biologically and psychologically, such as the development of primary and secondary attributes and changes in attitudes and fluctuating emotions (8,9). Therefore, adolescents are vulnerable to external values that can encourage deviant behaviors, such as smoking (10). Adolescents who smoke are more susceptible to addiction and long-term health risks, such as heart disease, high blood pressure, and lung cancer (11).

Smoking behavior can start with intention, and this intention becomes a primary driver for action (12). Research also shows that the stronger the intention to smoke, the greater the tendency for adolescents to smoke (13). The Theory of Planned Behavior (TPB) explains that attitudes, subjective norms, and perceived behavioral control influence smoking intentions. When attitudes toward smoking are positive, subjective norms are supportive, and perceived behavioral control is low, the intention to smoke becomes stronger (14). Several studies based on TPB have revealed a strong correlation between smoking intentions and smoking behavior among adolescents. These findings suggest that smoking intentions are a key indicator that can predict the likelihood of adolescents smoking in the future (15).

Research conducted at State Junior High School 3 in South Tangerang City showed that 64 students (22.22%) smoked, with environmental factors around the school contributing to this behavior (16). The study also found that family factors, friends, the desire to appear cool, and peer pressure influence smoking behavior among students (17). Preliminary research in February 2024 showed that 9 out of 15 students (60%) at State Junior High School 3 South Tangerang City had the intention to try smoking. Although preventive measures, such as school regulations and counseling services, have been implemented, they have not been effective in reducing students' smoking intentions. Therefore, this study aims to further investigate the factors influencing adolescents' intentions to smoke.

METHOD

This type of research is a quantitative study with a cross-sectional approach. This approach captures the relationship between variables at a certain point in time. Additionally, this approach can explain the relationship between the health phenomena studied and the accompanying factors, particularly persistent properties (18).

The sampling technique used is proportional stratified random sampling, which is a sampling method within the probability sampling group. If there are different strata within the population and each stratum is proportionally represented in the sample, this strategy is used (19). Therefore, the number of samples in each class was calculated proportionally from grades VII to IX. The minimum sample size was determined using Lemeshow's formula for a two-proportion hypothesis test with a 5% significance level (20). The resulting sample size was 276 adolescents, with the sample selection done by lottery using the Number Picker Wheel website, with the criteria being adolescents who were not active smokers.

Data collection was carried out using a questionnaire, which was explained to the respondents before filling it out. Respondents took 10-15 minutes to answer the questionnaire, after which the questionnaire was collected and rechecked by the researcher for completeness. The research instrument was developed based on references from previous studies (21,22,23) then further developed and adapted. The variables focused on in this study included respondent characteristics (gender, age, and class), as well as variables aligned with the theory of planned behavior, consisting of the dependent variable (smoking intention) and independent variables (including attitudes, subjective norms, and behavioral control over smoking). Data analysis was conducted using univariate analysis, bivariate analysis with the chi-square test, and multivariate analysis using multiple logistic regression. This study received approval from the Research Ethics Committee at Muhammadiyah University Prof. DR. HAMKA with number 03/24.03/03172.

RESULTS

Overview of Respondent Characteristics

The description of respondent characteristics serves to provide an initial overview and summary of the respondents' demographic profile and basic characteristics. Based on the research that has been conducted, the following data was obtained:

Table 1. Respondent Characteristics (N=276)

Characteristics	n	%
Gender		
Male	143	51.8
Female	133	48.2
Age		
12 Years	27	9.8
13 Years	91	33.0
14 Years	107	38.8
15 Years	51	18.5
Grade		
VII	90	32.6
VIII	98	35.5
IX	88	31.9

Table 1 shows the characteristics of the respondents in this study. The results indicate that most of the respondents were male, with a total of 143 people (51.8%). In terms of age, the majority of respondents were 14 years old, totaling 107 people (38.8%). Additionally, most respondents were from grade VIII, with a total of 98 people (35.5%).

Factors Related to Smoking Intention

Based on this research, the factors related to smoking intentions among adolescents, identified through bivariate analysis with chi-square, are as follows:

Table 2. Bivariate Analysis (N=276)

Variables	Smoking Intention				p-value	PR	CI 95%	
	Strong	%	Weak	%			Lower	Upper
Attitude Toward Smoking								
Supportive	116	80.6	28	19.4	0.000	2.658	2.028	3.485
Non-Supportive	40	30.3	92	69.7				
Subjective Norm								
Negative	125	82.8	26	17.2	0.000	3.338	2.439	4.568
Positive	31	24.8	94	75.2				
Perceived Behavioral Control								
Weak	121	78.6	33	21.4	0.000	2.739	2.046	3.666
Strong	35	28.7	87	71.3				

Table 3 shows the factors associated with smoking intentions among adolescents. The results indicate that 116 respondents (80.6%) with a supportive attitude toward smoking have a strong intention to smoke. The bivariate analysis between attitude and smoking intention resulted in a PR value = 2.658, 95% confidence interval (CI) = 2.028–3.485, and a p-value = 0.000. The analysis shows that individuals with a supportive attitude toward smoking have a 2.658 times greater risk of having a strong intention to smoke compared to those with a non-supportive attitude. Attitude has a significant relationship with smoking intention (p-value<0.05).

Among respondents with a negative subjective norm toward smoking, 125 (82.8%) have a strong intention to smoke. The bivariate analysis between subjective norm and smoking intention showed a PR value = 3.338, 95% confidence interval (CI) = 2.439–4.568, and a p-value = 0.000. This indicates that individuals with a negative subjective norm have a 3.338 times higher risk of having a strong intention to smoke compared to those with a positive subjective norm. Subjective norm is significantly related to smoking intention (p-value<0.05).

For respondents with weak perceived behavioral control over smoking, 121 (78.6%) have a strong intention to smoke. The bivariate analysis between perceived behavioral control and smoking intention revealed a PR value = 2.739, 95% confidence interval (CI) = 2.046–3.666, and a p-value = 0.000. The analysis shows that individuals with

weak perceived behavioral control have a 2.739 times higher risk of having a strong intention to smoke compared to those with strong perceived behavioral control. Perceived behavioral control is significantly related to smoking intention (p -value < 0.05).

The Most Influential Smoking Intention Factor

To identify the dominant variables affecting smoking intentions among students using multiple logistic regression analysis, the researcher first conducted bivariate selection to obtain candidate variables, which are as follows:

Table 3. Variable Selection

Variables	P-value	Description
Attitude Toward Smoking	0.000	Candidate
Subjective Norm	0.000	Candidate
Perceived Behavioral Control	0.000	Candidate

Table 4 shows that after performing the analysis using a simple logistic regression model, all variables were included as candidate variables in the initial multivariate model (P -value < 0.25). The next step, after including all candidate variables in the initial multivariate model, is to present the results of the multiple logistic regression analysis in the initial model as follows:

Table 4. Multivariate Analysis (N=276)

Variables	P-value	OR	95% CI	
			Lower	Upper
Attitude Toward Smoking Supportive	0.001	3.232	1.638	6.376
Subjective Norm Negative	0.000	5.690	2.885	11.220
Perceived Behavioral Control Weak	0.000	4.259	9.084	9.084

Table 5 shows that all variables, including attitude toward smoking (P -value 0.001), subjective norms (P -value 0.000), and perceived behavioral control over smoking (P -value 0.000), were included in the initial model. No variables were excluded from the initial model as all variables had a P -value < 0.05 . This indicates that all variables included in the initial model have significant and relevant contributions to the dependent variable. Therefore, the initial model is considered valid and remains consistent without any confounding factors affecting the analysis results. Consequently, the analysis can be considered complete without the need for modifications or additional testing (initial model = final model).

The results show that among all independent variables, the smoking subjective norm has the most dominant influence on smoking intentions among adolescents, with a P -value of 0.000 and an OR value of 5.690 (95% CI 2.885-11.220). This means that the subjective norm of smoking increases the likelihood of adolescents having smoking intentions by 5.690 times. In other words, the stronger the social norms supporting smoking within the adolescent environment, the greater the likelihood that they will have intentions to smoke.

DISCUSSION

Research conducted in various regions has demonstrated a significant relationship between attitude and smoking intention among adolescents. Smoking attitude can be understood as the difference in perception between the benefits and risks of smoking. Individuals with a supportive attitude towards smoking tend to perceive the benefits as outweighing the risks (24). A study in Kulon Progo, Yogyakarta, found that attitude has a strong relationship with smoking intention, with a p -value of 0.001 (13). Similar results were found among junior high school students in Bandung, where a significance level of 0.000 indicated a strong correlation between attitude and smoking intention (25). Another study at X Hospital in Bandung also showed that attitude plays a significant role in smoking intention, with a p -value of 0.032 (26). However, these findings are not always consistent. Research in Palembang found no significant relationship between attitude towards smoking behavior and smoking intention, with a p -value of 0.190 (21). Based on the data from this study, adolescents generally have an attitude that tends to support smoking behavior. This supportive attitude is often based on the belief that smoking offers various benefits, such as increasing self-confidence, appearing cooler, facilitating social interactions, reducing stress, and serving as a symbol of maturity and masculinity (27). Therefore, a supportive attitude towards smoking behavior plays a significant role in driving smoking intention among adolescents.

Subjective norms play a crucial role in shaping smoking intentions among adolescents. Research conducted in Kulon Progo, Yogyakarta, demonstrates a significant influence between subjective norms and smoking intentions (P-value 0.001) (28). Similar results were found in a study in Bandung City, which revealed a strong correlation between subjective norms and smoking intentions among adolescents (25). Another study in Palembang also indicated a significant relationship between subjective norms and smoking intentions (P-value < 0.001) (21). However, these findings contradict research at Rumah Sakit X Hospital in Bandung, which found no significant relationship between subjective norms and smoking intentions (P-value 0.540) (26). Subjective norms are often influenced by individual beliefs and approval from social groups, including family and friends who smoke (29). Other research also emphasized that the social environment plays a significant role in shaping smoking intentions among adolescents (30).

Individuals with a low perception of behavioral control, who feel they lack control over themselves and their actions, are more likely to make impulsive decisions and be easily influenced by external factors, increasing their risk of engaging in negative behaviors such as smoking (31). Previous research at X Hospital in Bandung demonstrated a significant positive correlation between perceived behavioral control and smoking intentions (26). Research in Palembang also supports this finding with a P-value < 0.001, indicating a significant relationship between perceived behavioral control and smoking intentions (21). Similar results were found in a study of junior high school students in Bandung City, showing a coefficient of 0.673 and a significance level of 0.000 ($p < 0.05$), indicating a strong correlation between perceived behavioral control and smoking intentions (25). Another study in Kulon Progo, Yogyakarta, also found a significant effect between perceived control and smoking intentions (13). Based on these findings, it can be concluded that a weak perception of behavioral control among adolescents reflects their lack of confidence in managing smoking behavior. This strengthens their intention to smoke, especially when they feel that external factors such as cigarette advertising or lenient policies will not prevent them from smoking (25).

Among the three independent factors—attitudes, subjective norms, and perceived behavioral control regarding smoking—the results indicate that the dominant variable is subjective norms. Specifically, respondents with negative subjective norms are 5.690 times more likely to have a strong intention to smoke compared to those with positive subjective norms (95% CI 2.885-11.220). This finding reinforces previous research, which identified subjective norms as the most dominant factor influencing smoking intentions, with a risk range of 4.787 to 427.222 times among mid-adolescents in Palembang City (21).

CONCLUSION

The study results showed that most adolescents had strong smoking intentions, supportive attitudes towards smoking, negative subjective norms, and a weak perception of control over smoking behavior. Additionally, the study revealed a significant relationship between smoking attitudes, subjective norms, and perceived control with smoking intentions. Among these factors, subjective norms emerged as the most dominant variable influencing smoking intentions among adolescents.

SUGGESTION

The school can intensify its peer education program by involving students as change agents to influence their peers to avoid smoking. Additionally, it should conduct a deeper analysis of the factors shaping subjective norms and design school-based interventions specifically targeting changes in these norms.

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