



## Determinants of the Use of Conventional Cigarettes in School Children in Yogyakarta City

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### Abstract

**Background:** The prevalence of child smokers in Indonesia continues to increase. The number of child smokers in Yogyakarta City also continues to increase. This study aims to describe the determinants of conventional cigarette use in school children in Yogyakarta City.

**Methods:** The study used a quantitative method with a cross-sectional design. Data was collected through a direct survey of schools using the Kobo toolbox application. The sampling technique was proportional stratified random sampling. There were 582 samples from 3 State Junior High Schools and 4 Private Junior High Schools.

**Results:** There was a correlation between knowledge and the use of conventional cigarettes (PR=4.22; CI=2.726-6.534;  $p < 0.001$ ), the affordability of cigarettes (PR=2.72; CI 95%=1.793-4.122;  $p < 0.001$ ), the availability of cigarettes (PR=2.60; CI 95%=1.738-3.893;  $p < 0.001$ ), family members' smoking behavior (PR=2.39; CI 95%=1.565-3.642;  $p < 0.001$ ) and peer smoking behavior (PR=7.79; CI 95%=4.707-12.920;  $p < 0.001$ ). The multivariate test results showed that the determinants most related to the use of conventional cigarettes in adolescents were peers (PR=9.36; CI 95%=5.138-17.038;  $p < 0.001$ ).

**Conclusion:** The determinants of conventional cigarette use in children are peer smoking behavior, lack of knowledge related to conventional cigarettes and their impacts, smoking behavior of family members, cigarette addiction, and the availability of cigarettes. Suggestion: The results of research related to the determinants of smoking behavior can be used as advocacy material for policy-makers to control cigarette consumption in school children.

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## INTRODUCTION

WHO data (World Health Organization) shows that cigarettes cause more than 7 million deaths per year, and this figure is expected to increase by 2030 to more than 10 million deaths per year (World Health Organization, 2017). Currently, smoking habits are not only a problem for adults but also for children and adolescents. Based on data from Basic Health Research in Indonesia, there was an increase in the prevalence of smoking in the population aged 10-18 years, namely from 2013 (7.2%) to 2018 (9.1%), an increase of 1.9% (Ministry of Health of the Republic of Indonesia, 2018)

Based on the Basic Health Research in 2013, the Special Region of Yogyakarta (DIY) is among the top 15 and has the highest % smokers in Indonesia, 31.6%. Daily smokers aged 10-19 years old are 15.6%. Yogyakarta City is the second highest contributor to the level of smokers in the province, at 26.2 percent. (Ministry of Health of the Republic of Indonesia, 2013). Basic Health Research data in 2018 showed that the proportion of smoking in the population aged  $\geq 10$  years is 19.5%. The proportion of first-time smokers in the population aged 10-14 years is 30.6%. The latest data from the Global Youth Tobacco Survey (GYTS) in 2019 shows that 40.6% of students in Indonesia (aged 13-15 years) have used tobacco products, and the number of students who currently smoke is 19.2% (WHO Indonesia, 2020).

Many factors affect the use of conventional cigarettes in children and adolescents. Among them are the factors of knowledge, attitude, and ease of accessing cigarettes after being controlled by family support. Ease of access to cigarettes is the most dominant factor related to adolescent smoking behavior. Students who quickly access cigarettes are 4.49 times more likely to smoke than those who do not have easy access to cigarettes after being controlled by knowledge, attitudes, and family support (Jannah & Yamin, 2021). Other researchers found that as part of the role model, it is expected that students will not smoke in the school environment, and teachers will be more active in providing information about the impact of smoking through teaching and learning activities. (Andi, 2021). Based on research conducted by Urrohmah (2021) found

that the determinants of adolescent smoking behavior include knowledge, attitudes, cigarette regulations at school, parental influence, and peer influence. This study aims to determine the determinants of using conventional cigarettes in school children in Yogyakarta City.

## METHODS

The type of research was a cross-sectional survey. The locations used as this research site are State Junior High Schools (SMPN) and Private Junior High Schools in Yogyakarta City. The population in this study was all students in grades 1-3 in State Junior High Schools and Private Junior High Schools in Yogyakarta City, including seven junior high schools. This was determined based on the 2014 Global Youth Tobacco Survey results, which state that the age of first smoking is between 12 and 13 years old or equivalent to junior high school age. The inclusion criteria for the sample in this study are as follows: junior high school students in the public and private sectors who were still active and between 13 and 15 years old. Exclusion criteria were criteria for population members that cannot be sampled. The exclusion criteria in this study were absent when data collection is carried out, and the data needs to be completed. The minimum sample size (582 respondents) was determined using a hypothesis testing formula for the proportion of two populations, a significance level of 5%, and a strength level of 90% (Lemeshow et al. Determination of schools using probability sampling/random. There were 3 State Junior High Schools and 4 Private Junior High Schools. School groupings were differentiated based on strata, namely public and private schools, with stratified random sampling. Independent variable: predisposing factor (Level of knowledge about conventional cigarettes and their impact on health), supporters (the availability of cigarettes, that is, the presence or absence of cigarettes in and around the school environment, the affordability of cigarettes, namely how to get conventional cigarettes in an easy or not easy way to obtain cigarettes, including in terms of the maximum price and sales at school, and reinforcement (smoking behavior of family members that is whether or not there is a family that uses conventional cigarettes, the smoking

behavior of peers is the presence or absence of friends who use conventional cigarettes. Bound variable: use of conventional cigarettes. Data collection used a questionnaire method using a structured questionnaire—instruments adopted from research (Trisnowati, 2012) (Kurniasih, 2008). The data was analyzed using SPSS version 20. Univariate data analysis to obtain an overview of the frequency distribution of each variable, bivariate using the chi-square to determine the relationship with the use of conventional cigarettes, then the independent variable with p-value <0.25 in the bivariate

test is included in the multivariate analysis using the logistic regression. This research had received permission from the Research Ethics Commission of Respati University of Yogyakarta with No. 134.3/FIKES/PL/IX/2022.

## RESULTS AND DISCUSSIONS

### Characteristics Respondent

The characteristics of the respondents in this study include school origin, age, class, and gender. The characteristics of the respondents can be seen in Table 1.

Table 1. Characteristics of Respondents

Variable	Number (n)	Percentage (%)
<b>Asal Sekolah</b>		
Junior High School A	17	2.9
Junior High School B	52	8.9
Junior High School C	181	31.1
Junior High School D	92	15.8
Junior High School E	156	26.8
Junior High School F	43	7.4
Junior High School G	41	7.1
<b>Age</b>		
12	25	4.2
13	153	26.2
14	280	48.2
15	111	19.1
16	12	2.1
17	1	0.2
<b>Class</b>		
7	59	10.1
8	277	47.6
9	246	42.3
<b>Gender</b>		
Boys	259	44.5
Girls	323	55.5

Table 1 shows that the school category's origin is private, with as many as 153 students (26.3%), and public, with as many as 429 students (73.7%). Most of them were 14 years old (48.1%), in grade 8 (47.6%), and primarily women (55.5%).

### Univariate Analysis

The variables that were studied were predisposition factors (level of knowledge about conventional cigarettes and their impact on health), supporting factors (cigarette availability, cigarette affordability), and reinforcing factors (smoking behavior of family

members and smoking behavior of peers) with the use of conventional cigarettes in school children in Yogyakarta City. The result of the analysis can be seen in Table 2.

Table 2 showed that most students' knowledge was good (98.6%). In schools, there were mostly no cigarette sellers (93.3%), and most were cigarette sellers around the school (55%). The daily allowance for students is mostly Rp11,000 – Rp15,000 (39.5%). Most of them have family members who smoke (59.5%), and the number of close people who smoke or peers who smoke > 4 people (17%).

Table 2. Univariable Analysis

Variable	Number (n)	Percentage (%)
<b>Knowledge</b>		
Less	8	1.4
Good	574	98.6
<b>There are cigarette sellers in schools.</b>		
Available	39	6.7
No	543	93.3
<b>There are cigarette sellers around the school.</b>		
Available	320	55
No	262	45
<b>Pocket Money Per Day</b>		
IDR 1,000 – IDR 5,000	50	8.6
IDR 6,000 – IDR 10,000	176	30.2
IDR 11,000 – IDR 15,000	230	39.5
>Rp16.000,-	126	21.7
<b>There are Family Members Who Smoke</b>		
Ya	346	59.5
No	236	40.5
<b>Number of Peers Who Smoke</b>		
No one	335	57.5
One person	44	7.6
Two people	40	6.9
Three people	38	6.5
Four people	26	4.5
>4 people	99	17.0

Table 3. Results of Bivariate Analysis of Conventional Cigarettes

Variable	Conventional Smoking Behavior				<i>p</i> value	PR	CI 95%	
	Ever tried smoking	%	Never Smoke	%			Lower	Upper
<b>Knowledge</b>								
Less	6	75	2	25	<b>0,001</b>	4,22	2.726	6.534
Good	102	17.8	472	82.2				
<b>Cigarette Affordability</b>								
Available	83	25.9	237	74.1	<b>0,000</b>	2,72	1.793	4.122
None	25	9.5	237	90.5				
<b>Cigarette Availability</b>								
Available	17	43.6	22	56.4	<b>0,000</b>	2,60	1.738	3.893
None	91	16.8	452	83.2				
<b>Family Members' Smoking Behavior</b>								
Exist	84	24.3	262	75.7	<b>0,000</b>	2,39	1.565	3.642
None	24	10.2	212	89.8				
<b>Peer Smoking Behavior</b>								
Exist	92	37.2	155	62.8	<b>0,000</b>	7,79	4.707	12.920
None	16	4.8	319	95.2				

The pattern of using conventional cigarettes is that there are 108 people (18.6%) who have tried conventional smoking; the number of conventional cigarettes that have been smoked is mostly only one cigarette, as many as 48 (8.2%). The duration of conventional smoking mainly was less than one year, as many as 73 (12.5%). The age of starting smoking is mostly more than ten years old, as many as 76 (13.1%). Current smoking habits are mostly < 1 in a month, as many as 44 (7.5%). Smoking vulnerability is 133 (22.9%). The reason for conventional smoking was primarily curiosity/ wanting to try as many as 43 (7.4%).

**Bivariate Analysis**

The data analysis used in this study was the chi-square test, which was used to determine the statistical significance. The strength of the relationship was seen using the Prevalence Ratio (PR) with a confidence interval (CI) of 95%. The results of the bivariate analysis can be

seen in Table 3:

Based on Table 3, variables that had a significant correlation with conventional smoking behavior were knowledge (PR=4.22; CI=2,726-6,534; p-value<0.001), cigarette affordability (PR=2.72; CI 95%=1.793-4.122; p-value <0.001), cigarette availability (PR=2.60; CI 95%=1.738-3.893; p-value <0.001), smoking behavior of family members (PR=2.39; CI 95%=1.565-3.642; p-value <0.001) and peer smoking behavior (PR=7.79; CI 95%=4.707-12.920; p-value <0.001).

**Multivariable Analysis**

The variables included in the multivariate analysis were knowledge level, cigarette availability, cigarette affordability, smoking behavior of family members, and smoking behavior of peers because the p-value was <0.25 during the bivariate analysis. The results of the multivariate analysis can be seen in the Table 4.

Table 4. Results of Multivariable Analysis of Conventional Cigarette Use

Variable	Model 1 OR CI 95% <i>p-value</i>	Model 2 OR CI 95% <i>p-value</i>
<b>Level of Knowledge</b>		
Less	17.62 (2.631-117.989) 0,003**	23.47 (3.346-164.617) 0.001**
<b>Availability of cigarettes</b>		
Exist	1.94 (0.891-4.223) 0.095	
<b>Affordability of cigarettes</b>		
Exist	1.73 (0.997-2.996) 0.051	1.89 (1.101-3.235) 0.021*
<b>Family members' smoking behavior</b>		
Exist	1.88 (1.089-3.236) 0.023*	1.91 (1.112-3.286) 0.019*
<b>Peer smoking behavior</b>		
Exist	9.36 (5.138-17.038) 0.000***	9.44 (5.194-17.152) 0.000***

\*= significant

Description: OR = *Odd Ratio*, CI = *Confident Interval*, 1: Reference; Significance Value

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Based on Table 4, there are two models in the multivariate analysis, namely model 1, which includes all variables, and model 2, which eliminates the variable of cigarette availability because of p-value until it was removed from the model. After conducting a multivariate analysis and obtaining two models, the comparison of the quality of model 1 and model 2 was continued. The selection of the

model depends on the statistically determined quality. The quality of the model depends on the calibration and discrimination values. In a prediction model with a categorical output, the calibration value is tested by Hosmer and Lemeshow, while the value of discrimination with the Area Under the Curve (AUC) (Dahlan, 2011).

Table 5. Comparison of Model 1 and Model 2

Model	Variable	Statistics	
		Calibration (Hosmer-Lemeshow Test)	AUC Discrimination (IK95%)
Model 1	1. Level of Knowledge	Good (p>0.05) (0.611)	Strong= 0.824 (0.786-0.862)
	2. Availability of cigarettes		
	3. Affordability of cigarettes		
	4. Family members' smoking behavior		
	5. Peer smoking behavior		
Model 2	1. Level of Knowledge	Good (p>0.05) (0.640)	Strong= 0.816 (0.777-0.855)
	2. Affordability of cigarettes		
	3. Family members' smoking behavior		
	4. Peer smoking behavior		

Calibration is said to be good if the p-value on the test Hosmer and Lemeshow is more significant than 0.05, which means there is no difference between the observation value and the expectation (expected). The value of discrimination is said to be good if the AUC value is greater than or equal to the minimum expected AUC value. Generally, the AUC value is said to be strong if it is greater than 80% (Dahlan, 2011).

Based on Table 5, all models have good calibration because the p-value in the Hosmer and Lemeshow test is more significant than 0.05. Based on discrimination, the best model is model 1, followed by model 2. It can be concluded that statistically, the logistic regression equation model 1 is suitable for predicting the incidence of conventional cigarette use. The equation contains variables such as knowledge level, cigarette availability, cigarette affordability, family members' smoking behavior, and peers' smoking behavior. Model 1 shows that people who have peers who smoke are 9.36 times more likely to use conventional cigarettes compared to people who do not have peers who smoke.

This research was conducted in State Junior High Schools and Private Junior High Schools in Yogyakarta City, based on research

the number of schools bigger in State Junior High Schools (73.7%) because the number of students in Private Junior High Schools is fewer than State Junior High Schools. Based on gender, most of them are women (55.5%), and the results of the study found that women have also tried smoking. The results of previous research stated that adolescent boys still dominate smoking behavior in adolescents, but some adolescent girls smoke but only a small number (4.3% of all subjects who smoke) (Astuti, 2012).

The study results showed that most of the knowledge was good (89.3%). Education affects the level of knowledge because education affects the learning process; the higher a person's education, the easier it is for a person to receive information so that knowledge improves (Notoatmodjo, 2014). Results from research conducted by Hermin & Kurnia (2019) showed that most adolescents had high knowledge about smoking, namely 15 people (33.3%) respondents.

The study results showed the supporting factors for the availability of cigarette sellers around the school (55%). The student's daily allowance is IDR 11,000 – IDR 15,000 (39.5%). The availability of facilities and infrastructure,



which are factors supporting adolescent smoking behavior, is caused by the characteristics of lifestyles in urban environments that tend to be lavish so that shops or stalls can be easily found in every neighborhood, one of which is the school environment. In addition, if you look at the pocket money of junior high school students, this study shows that most junior high school students are given pocket money of more than ten thousand rupiahs daily, allowing children to use pocket money to buy cigarettes (Sulistiyawan, 2012).

The results of the previous study stated that of all respondents, students who had easy access to cigarettes were 46.5%. Access to cigarettes among students is strengthened by the influence of the environment that is still pro on cigarettes, as evidenced by the many cigarette advertisements, music events with sponsorship from cigarettes, and support from the student's parents, such as parents who know that their children smoke are only allowed not to buy cigarettes (Fadli, 2015). Opinions related to the price of conventional cigarettes mostly answered mediocre. The price of cigarettes that are not expensive and can buy cigarettes makes teenagers tend to be tempted and feel addicted to cigarettes. The factor of ease of smoking, both in terms of price and the availability of cigarettes, has led to an increase in the number of smokers. One cigarette at a reasonably low price can be found in stalls near the school so that teenagers can quickly get cigarettes according to the amount of pocket money from their parents, then cigarettes in addition to the affordable price, they can buy one or two cigarettes and cigarettes can be bought easily because every shop always sells cigarettes (Nababan, 2019).

Based on the study results, most of the family members who smoke (59.5%) and most of the family members who smoke were fathers. The family is the first place of learning for a teenager and plays a role in shaping the attitude of adolescents. Parents are role models for children and models for a child (teenager). Parents or siblings who smoke are behaviors that can be imitated. If no one in the family smokes, the parents' attitude positively influences smoking behavior. Moreover, vice versa, if a family member becomes a smoker,

the parent's behavior brings a negative influence that the child will imitate. The results of previous research showed that as many as 22 (73%) respondents stated that their fathers were family members who smoked at home. In comparison, 3% of respondents stated that their older brothers were family members who smoked at home. As many as 3 (11%) respondents stated that their fathers and older brothers were family members who smoked at home. (Mirnawati et al., 2018). Results (Rachmat et al., 2013) showed that around 60.7% of respondents admitted that they had been told to buy cigarettes, and 56.7% of respondents had been invited to smoke by their families.

The number of close people who smoke or peers who smoke >4 people (17%). People who smoke were primarily friends. Previous research stated that the factors that cause students to smoke are due to the influence of friends and a desire to experiment, parents who smoke, the environment, to look more mature and manly, and to eliminate boredom and boredom. The influence of friends and experimentation is the main reason why students have smoking behavior because so far, they have been hanging out with smokers, both playmates at school and playmates at home; even most of the friends who hang out at home are classified as adult teenagers who smoke cigarettes every day. This makes them influenced to smoke cigarettes because there is satisfaction after smoking (Muslimin et al., 2013).

Situations that make smoking mostly when relaxed/whimsical (7.2%). Previous research stated that the reason for smoking for the first time for most respondents was prank as many as 22 people (43.1%) (Ardiyanti et al., 2020). Students smoke when they get together with their friends after they finish eating or when they have problems with either their girlfriends or family. They usually smoke outside school, such as in coffee shops, roadsides, and parking lots. Even if there are people at school, they usually smoke in toilets, canteens, and behind the school (Muslimin et al., 2013)

The pattern of conventional cigarette use was divided into three categories, namely, never smoking (81.6%), having tried conventional

smoking (18.6%), and smoking susceptibility (22.9%). Results (Trisnowati, 2012) explain The number of adolescents who have tried smoking is 39.5%, current smokers (current smokers) 58.9%, and prone to smoking 11.6%. The behavior of trying to smoke can develop into regular use because cigarettes contain nicotine, which is addictive. Nicotine is a psychoactive substance that stimulates and motivates smokers to always smoke. (Astuti, 2012)

The number of conventional cigarettes that had been smoked is mostly only 1 (8.2%), and the duration of conventional smoking was mostly less than one year (12.5%). Results Almeida et al., 2020) show that the number of cigarettes consumed by adolescents per day is relatively low, namely 1-5 cigarettes per day (68.7%), and 30 respondents (36.1%) have smoked in less than one year. This shows that teenagers are light smokers because teenagers have just started smoking. The age of starting smoking is mostly more than ten years old (13.1%). Results (Astuti, 2012) showed that most adolescents started smoking at the age of 11-14 years, which was as many as 141 students (75%). From this age range, the age at which smoking started was the most at 12 years old, then 11 years old, and 13 years old. Smoking behavior in adolescence is inseparable from adolescents' typical characteristics, namely adolescents' tendency to seek sensations, like to try new things, and are easily influenced by the surrounding environment.

Current smoking habits were mostly <1 in a month (7.5%). The reason for conventional smoking was mostly curiosity/wanting to try (7.4%). Results (Mirnawati et al., 2018) As many as 14 (46%) respondents had smoked; the reason teenagers smoke is due to the influence of friends and the desire to try. Teenage smokers start with a vast curiosity, then try and eventually become a cultural habit. The curiosity of adolescents to smoke will lead to the habit of becoming active smokers (Nugroho, 2017).

### **The Relationship Between Knowledge and Conventional Smoking Behavior**

The study results show that knowledge had a significant relationship with conventional smoking behavior (RP=4.22; CI=2.726-6.534; p-value <0.001). The results of the analysis

could be concluded that people who have less knowledge are 4.22 times more likely to try smoking compared to people who have good knowledge. The results of this study are in line with previous research, which stated that there was a significant relationship between knowledge and smoking behavior in junior high school students, and students with poor knowledge were 4.76 times more likely to smoke than students with sound knowledge (Sarino & Ahyanti, 2012). One of the factors that determines a person's behavior is the predisposition factor, including knowledge. Respondents who have good knowledge about cigarettes tend not to smoke; on the contrary, respondents who have less knowledge about cigarettes tend to smoke behavior. Knowledge can be influenced by several factors, namely education, information, and the environment. Education can increase a person's insight or knowledge; a person with higher education will have a broader knowledge base than someone with a lower education. Information obtained from various sources will affect a person's level of knowledge. Information can be obtained from reading various sources of books, magazines, or newspapers; it can also be obtained by listening to the radio and watching television shows to provide learning to increase knowledge. Another factor that can affect the level of knowledge is the environment, such as the school environment. School is a very appropriate place in terms of increasing knowledge and straightening out every piece of information by revealing the truth by conveying the good and bad of smoking behavior and the significant impact that smoking behavior will have (Notoatmodjo, 2014)(Sarino & Ahyanti, 2012). The results of this study are in line with the research (Andika et al., 2016) The results of the study on 228 people were obtained by respondents with a good knowledge level of 60% and a smoking incidence of 1%, and there was a relationship between the level of knowledge about cigarettes and the incidence of smoking in state junior high school 1 Pariaman students. Another study also showed a significant relationship between knowledge about the dangers of smoking and smoking behavior (p-value =0.003 <  $\alpha$  0.05) in students of SMP Negeri 2 Lubuk Alung. (Nur et al., 2022).



### **The Relationship between Cigarette Affordability and Conventional Smoking Behavior**

The results of the study showed that affordable cigarettes had a significant relationship with conventional smoking behavior (RP=2.72; CI 95%=1.793-4.122; p-value <0.001). The results of the analysis can be concluded that the affordability of cigarettes is 2.72 times more likely to try smoking compared to the absence of affordability of cigarettes. The results of this study are in line with the research. (Oktaviani et al., 2019) This showed an OR of 4.76, meaning that respondents who stated that cigarettes were affordable had a 4.76 times greater chance of smoking behavior compared to respondents who stated that cigarettes were unaffordable. The statistical test results were obtained with the result p-value=0.009, which means there was a significant relationship between the affordability of cigarettes and smoking behavior. Another study also stated that there was a significant relationship between the affordability of cigarettes and the smoking behavior of respondents and respondents who were 4.98 times more likely to become smokers (Simarmata, 2012)

Cigarette prices in Indonesia can cause the affordability of cigarettes to be cheap when compared to cigarette prices in neighboring countries. The price of cigarettes is low because the excise duty charged by the government is deficient, so cigarette consumption increases. Cigarettes have become affordable for teenagers' pocket money at school, especially cigarette sellers sometimes sell cigarettes at retail per cigarette, this is what makes it easy for teenagers to get a cigarette. Another thing that makes cigarettes affordable is the school's location, which is adjacent to several stalls that sell cigarettes. This facility essentially supports or enables teenagers to freely become smokers and become smokers (Simarmata, 2012).

### **The Relationship between Cigarette Availability and Conventional Smoking Behavior**

The study results show that the availability of cigarettes had a significant relationship with conventional smoking behavior (RP=2.60; CI 95%=1.738-3.893; p-value <0.001). The results of the analysis could be concluded that the availability of cigarettes has a 2.60 times greater

chance of trying to smoke compared to the absence of cigarette availability. The results of this study are supported by research. (Larasati, 2014) This shows that the availability of cigarettes is closely related to students' smoking actions (p=0.001). The availability of cigarettes has an OR value of 11.56 (CI: 4.55- 29.39). This shows that the existence of the right time, the availability of money to buy cigarettes, the availability of cigarettes, and the existence of a comfortable and safe place to smoke will increase students' desire to smoke.

The ease of accessing cigarettes is one of the supporting factors related to a person's smoking behavior. Results (Jannah & Yamin, 2021) shows that there is a relationship between ease of access to cigarettes and adolescent smoking behavior. Students who easily accessed cigarettes were 4.49 times at risk (OR: 4.49; 95% CI: 1.677-12.037) to smoke compared to students who did not have easy access to cigarettes. Results (Jannah & Yamin, 2021) It is proven that the ease of access to cigarettes is the most dominant factor related to adolescent smoking behavior. Most students can quickly get cigarettes if they want to. This is supported by the availability of shops or stalls selling cigarettes near schools and residential neighborhoods. Small stalls in the neighborhood around the school can make it easier for someone to get cigarettes from the stall owner, regardless of whether the buyer is an adult or a teenager. This is what makes the number of young smokers, especially teenagers, increase from year to year and is a problem that the Government must immediately overcome. Moreover, it is necessary to make a policy regarding the restriction of cigarettes, especially for teenagers.

### **The Relationship Between Family Members' Smoking Behavior and Conventional Smoking Behavior**

The results of the study showed that the smoking behavior of family members had a significant relationship with conventional smoking behavior (RP=2.39; CI 95%=1.565-3.642; p-value <0.001). The results of the analysis can be concluded that the presence of family members who smoke was 2.39 times more likely to try smoking compared to the

absence of family members who smoke. The results of this study are supported by research (Simarmata, 2012) The results of the study obtained a value of  $p=0.000$  with a value of  $OR = 3.17$ , which means that there was a significant difference between the smoking behavior of family members and the smoking behavior of the respondents so that respondents who have family members who smoke tend to be smokers three times more likely to become smokers than respondents who do not have family members who smoke. Teenagers often try to imitate what their parents do. A child born into a family of smokers is more likely to imitate the smoking habits of their parents; this can begin with them as passive smokers who are always in the smoker's family environment, so they also inhale cigarette smoke. Results (Sulistiyawan, 2012) showed that there was a significant relationship between parents who smoked and the smoking behavior of students of state junior high school 3 South Tangerang ( $p=0.000$ ), with an  $OR$  value of 4.97, which means that students who have parents who smoke have almost five times the opportunity to smoke compared to students who do not have parents who smoke

Family is the closest and inseparable part, teenagers who have parents and siblings who smoke the majority will become smokers. Adolescents are curious about the sensations and flavors emitted from cigarettes, so they imitate these habits. Even though this behavior is a negative behavior imitated by a child from his parents, hostile behaviors such as the behavior of parents smoking in the house and having family members smoke are things that should not be imitated. Parents must set a good example for their children and provide support or encouragement not to smoke (Jannah & Yamin, 2021).

### **The Relationship between Peer Smoking Behavior and Conventional Smoking Behavior**

The results of the study showed that the smoking behavior of peers had a significant relationship with conventional smoking behavior ( $RP=7.79$ ;  $CI$  95%=4.707-12.920;  $p$ -value  $<0.001$ ). The results of the analysis could be concluded that the presence of peers who smoke is 7.79 times more likely to try smoking compared to the absence of peers

who smoke. The results of this study are supported by research. (Novariana et al., 2022) This showed that there was a peer relationship with smoking behavior among State Junior High School Students in Way Kanan Regency ( $p$  value=0.012). At the same time, the  $OR$  results were obtained at 6.4 (95%  $CI$  1.6-26.01), meaning that respondents under the influence of peers were 6.4 times more likely to smoke than respondents whom peers did not influence. The results of another study also showed that there was a relationship between the smoker's peers and the smoking habits of the respondents, which was shown by a  $p < 0.01$ . Judging from the value of  $OR = 2.65$  (95%  $CI$  1.29 - 5.47), it means that adolescents who have smoking peers are 2.65 times more likely to have smoking habits than adolescents who do not have smoking peers (Yulviana, 2015).

Peers are children or adolescents of the same age or maturity level. One of the main functions of peers is to provide a variety of information about the world outside the family. Peers are friends with relatively the same psychological qualities as themselves in attitude, values, and personality. (Amira et al., 2019). The more teens smoke, the more likely their friends are smokers. At the age of 12-13, peer pressure and other influences are increasingly difficult to resist. If peers in school smoke, younger teens will be tempted to join friends who smoke (Yulviana, 2015). Teenagers tend to do things that their peer group does; for example, if their friend smokes, the teenager will automatically be influenced and imitate smoking behavior and consider anything as a form of loyalty. Teens are often outside the home and spending time with their peers. Adolescents tend to want to be accepted in their group, so they have the potential to imitate what their peers are doing. Adolescents are inseparable from the influence of peers, so adolescents are often associated with problematic behaviors, one of which is smoking behavior (Anggraeni et al., 2019).

### **Determinants of the Use of Conventional Cigarettes in School Children in Yogyakarta City**

The determinant most related to the use of conventional cigarettes in adolescents is peers. Multivariate test results for the use

of conventional cigarettes showed that people who had peers who smoked were 9.36 times more likely to use conventional cigarettes compared to people who did not have peers who smoked. The results of this study are in line with the research (Sari, 2019) Which states that the influence of peers is a considerable smoking behavior; it is statistically proven that most students have friends with poor behavior (smoking), and there is a significant relationship between the peer factor of smoking and smoking behavior in high school students in Padang City with a ten times greater risk. Research conducted by (Rachmat et al., 2013) also states that peers are the dominant factor in influencing adolescents to smoke and are an essential source of adolescents' first cigarettes. Cigarettes are used to improve boys' social status among their peers and increase their self-confidence, maturity, and richness from their peers. The peer environment has a significant meaning for teenagers. The need to be accepted and the effort to avoid rejection by peer groups is a critical need. Teenagers do not want to be rejected and avoid being called sissy or coward. Smoking for teenagers is also a symbolization, a symbol of power, masculinity, and maturity. (Soesyasmoro et al., 2016).

Prevention and control of tobacco use in adolescents is essential to breaking the chain of smoking behavior or the tobacco epidemic in Indonesia and the world (Trisnowati et al., 2020). Smoking prevention programs in adolescents with a macro-level approach have been proven to be effective in reducing the prevalence of tobacco use in adolescents. For example, blocking a campaign marketing cigarettes, increasing cigarette taxes, and strengthening tobacco control policies have been successful and proven strategies for the prevention and reduction of tobacco use. (Backinger et al., 2003). Comprehensive smoking prevention programs include smoke-free area policies, parental and community involvement, school-based programs, smoking cessation services, and media to discourage cigarette advertising. Research is also needed to empower adolescents and engage them as tools or means that contribute to social change. (Backinger et al., 2003; Trisnowati et al., 2021).

Meanwhile, according to (Golechha,

2016), health promotion for the prevention and cessation of smoking behavior includes three approaches, namely: 1) through mass public, such as social marketing and mass media interventions; 2) through individuals, such as motivational intervening peer education; and 3) through a community approach, namely community mobilization, and environmental change through media advocacy and intervention based on settings. Community approaches have proven to be the most effective in preventing and controlling behavior. Involving the community and various stakeholders is an effective way of development and ensures the sustainability of partnerships in health promotion. (Golechha, 2016; Trisnowati et al., 2020, 2021)

## CONCLUSION

The determinants of conventional cigarette use in children in Yogyakarta City, from the most incredible opportunity to the smallest, were peer smoking behavior, lack of knowledge related to conventional cigarettes and their impacts, smoking behavior of family members, cigarette addiction, and the availability of cigarettes. The results of research related to the determinants of smoking behavior could be used as advocacy material for policymakers to control cigarette consumption in school children. Strategies to control the use of conventional cigarettes in children need to be carried out in a multilevel and simultaneously starting from the individual, organizational, community, and government levels so that they can strengthen each other. Such include educational activities at the individual to family level, community empowerment to narrow children's access to cigarettes, and policies regulating cigarette advertising, promotion, and sponsorship, especially in school areas.

## REFERENCES

- Almaidah, F., Khairunnisa, S., Sari, I. P., Chrisna, C. D., Firdaus, A., Kamiliya, Z. H., Williantari, N. P., Akbar, A. N. M., Pratiwi, L. P. A., Nurhasanah, K., & Puspitasari, H. P. (2020). Survey of Factors Causing Adolescent Smokers to Maintain Smoking Behavior. *Journal of Community Pharmacy*, 8(1), 20. <https://doi.org/10.20473/jfk.v8i1.21931>
- Amira, I., Hendrawati, & Senjaya, S. (2019). Factors

- related to smoking behavior in students of SMAN 2 Garut. *BSI Journal of Nursing*, 7(1), 118–122.
- Andi, R. F. (2021). Determinants of Smoking Behavior in MTSS Alue Bilie Students, Darul Makmur District, Nagan Raya Regency. *SAGO: Nutrition and Health*, 3(1), 62–73.
- Andika, D., Khairsyaf, O., & Pertiwi, D. (2016). The Relationship of Knowledge with the Incidence of Smoking in SMPN 1 Pariaman Students. *Andalas Health Journal*, 5(2), 361–364. <https://doi.org/10.25077/jka.v5i2.522>
- Anggraeni, H. F., Ruliati, & Inayatur Rosyidah. (2019). Peer Relationship with Smoking Behavior in Early Adolescents (Study at SMP PGRI 1 Perak) [*STIKes Insan Cendekia Medika, Jombang*]. <https://www.ptonline.com/articles/how-to-get-better-mfi-results>
- Ardiyanti, P. D., Harzani, S., Rahmah, S. A., Putri, Z. M., Putri, Z. N. K., & Mustakim. (2020). Overview of Smoking Behavior Knowledge during the Covid-19 Pandemic in Adolescent Boys in the Greater Jakarta Region in 2020. *Indonesian Journal of Health Sciences (JIKSI)*, 1(2), 1–8.
- Astuti, K. (2012). Overview of Smoker Behavior in Adolescents in Bantul Regency. *Insight*, 10(1), 77–87. <http://fpsi.mercubuana-yogya.ac.id/wp-content/uploads/2012/06/6.Gambaran-Perilaku-Merokok-Pada-Remaja-Di-Kabupaten-Bantul.pdf>
- Backinger, C. L., Fagan, P., Matthews, E., & Grana, R. (2003). Adolescent and Young Adult Tobacco Prevention and Cessation: Current Status and Future Directions. *Tobacco Control*, 12 Suppl 4(Suppl 4), IV46-53. [https://doi.org/10.1136/tc.12.suppl\\_4.iv46](https://doi.org/10.1136/tc.12.suppl_4.iv46)
- Dahlan, M. S. (2011). *Prognosis Research and Scoring Systems: Accompanied by Practice with SPSS and Stata*. Alqaprint Jatinangor.
- Fadli, R. K. (2015). *Smoking behavior of junior high school students in Panongan District, Tangerang Regency*. University of Muhammadiyah Prof. DR Hamka.
- Golechha, M. (2016). Health Promotion Methods for Smoking Prevention and Cessation: A Comprehensive Review of Effectiveness and The Way Forward. *International Journal of Preventive Medicine*, 7:7, pp. 1–5. <https://doi.org/10.4103/2008-7802.173797>
- Hermin, H., & Kurnia, M. M. (2019). Knowledge of Adolescent Smoking Behavior. *Journal of Health Sciences*, 1(1), 1–7.
- Jannah, M., & Yamin, R. (2021). Determinants of Smoking Behavior in Senior High School (SMA) Adolescents in Palopo City. *Journal of Health*, 14(1), 6–12. <https://doi.org/10.32763/juke.v14i1.276>
- Ministry of Health of the Republic of Indonesia. (2013). Riskesdas in the Special Region of Yogyakarta in 2013. *Health Research and Development Agency of the Ministry of Health of the Republic of Indonesia*, 26(4), 1–37.
- Ministry of Health of the Republic of Indonesia. (2018). *Basic Health Research (Riskesdas)* (2018). [https://kesmas.kemkes.go.id/assets/upload/dir\\_519d41d8cd98f00/files/Hasil-riskesdas-2018\\_1274.pdf](https://kesmas.kemkes.go.id/assets/upload/dir_519d41d8cd98f00/files/Hasil-riskesdas-2018_1274.pdf)
- Kurniasih, A. (2008). Factors Related to Smoking Behavior of Junior High School Students in Bekasi in 2008. *Thesis*. University of Indonesia.
- Larasati, T. (2014). Analysis Of Smoking Behaviour In Children. *JUKE Unila*, 4(7), 120–124.
- Lemeshow, S., Hosmer, D. W., Klar, J., & Lwanga, S. (1997). *Sample size in health research* (D. Pramono & H. Kusnanto (eds.)). Gadjah Mada University Press.
- Mirnowati, Nurfitriani, Zulfiarini, F. ., & Cahyati, W. . (2018). Smoking behavior in adolescents aged 13-14 years. *Higeia*, 2(3), 396–405. <http://journal.unnes.ac.id/sju/index.php/higeia>
- Muslimin, Christiana, E., Muhari, & Pratiwi, T. I. (2013). Factors Causing Smoking Behavior of Students in State Junior High School, Babat District. *Journal of BK UNESA*, 1(2), 116–124. <http://ejournal.unesa.ac.id/article/4834/13/article>
- Nababan, D. (2019). Factors Related to Smoking Behavior in Students at Arjuna Laguboti Private Vocational School, Toba Samosir Regency in 2018. *Helvetia Health Institute, Medan*.
- Notoatmodjo, S. (2014). *Health Behavioral Science*. Jakarta: PT Rhineka Cipta.
- Novariana, N., Mega Rukmana, N., Supratman, A., Studies, P., & Society, K. (2022). Peer Relationship to Smoking Behavior in State Junior High School Students in Way Kanan Regency. *Indonesian Journal of Health Sciences (JIKSI) E-ISSN*, 3(1), 39.
- Nugroho, R. S. (2017). Adolescent Smoking Behavior (Smoking Behavior as Social Identity of Adolescents in Socializing in Surabaya). *In Scientific Journal*, Department of Sociology, FISIP, Airlangga University.
- Nur, Y. M., Husna, N., & Rosmanidar. (2022). The Relationship between Knowledge about the Dangers of Smoking and Smoking Behavior of State Junior High School Students 2 Lubuk Alung. *Journal of Baiturrahim Jambi*



- Academic (JABJ)*, 11(1), 116–125.
- Oktaviani, N., Avianty, I., & Mawati, E. D. (2019). Factors related to smoking behavior in male students at Pakuan University Bogor, West Java Province in 2018. *Promoter of the Public Health Student Journal*, 2(1), 44–53. <https://doi.org/10.32832/pro.v2i1.1788>
- Rachmat, M., Thaha, R. M., & Syafar, M. (2013). Smoking Behavior of Junior High School Adolescents. *Kesmas: National Public Health Journal*, 7(11), 502. <https://doi.org/10.21109/kesmas.v7i11.363>
- Sari, A. (2019). Smoking Behavior Among High School Students in Padang City. *Scientific Journal of Public Health*, 11(3), 238–244.
- Sarino, & Ahyanti, M. (2012). Smoking Behavior in Junior High School Students. *Journal of Nursing*, 8(2), 148–155. <https://ejournal.poltekkes-tjk.ac.id/index.php/JKEP/article/view/157/149>
- Simarmata, S. (2012). Smoking behavior in Madrasah Tsanawiyah Negeri Model Kuok students, West Bangkinang District, Kampar Regency, Riau Province in 2012. *Public Health Thesis*, University of Indonesia, 1–158.
- Soesyasmoro, R. A., Demartoto, A., & Adriani, R. B. (2016). Effect of Knowledge, Peer Group, Family, Cigarette Price, Stipend, Access to Cigarette, and Attitude on Smoking Behavior. *Journal of Health Promotion and Behavior*, 1(3), 201–210.
- Sulistiyawan, A. (2012). *Factors Related to Smoking Behavior of State Junior High School Students 3 South Tangerang City* [Syarif Hidayatullah State Islamic University, Jakarta]. <http://repository.uinjkt.ac.id/dspace/bitstream/123456789/25475/1/AdeSulistiyawan-FITK.pdf>
- Trisnowati, H. (2012). Exposure to cigarette advertisements and smoking behavior among junior high school adolescents in Bantul Regency, Special Region of Yogyakarta in 2011. *Thesis*. Gadjah Mada University, Yogyakarta.
- Trisnowati, H., Ismail, D., & Padmawati, R. S. (2021). Health promotion through youth empowerment to prevent and control smoking behavior: a conceptual paper. *Health Education*, 121(3), 275–294. <https://doi.org/10.1108/HE-09-2020-0092>
- Trisnowati, H., Ismail, D., Padmawati, R. S., & Utarini, A. (2020). We are developing a framework for youth empowerment to prevent smoking behavior in a rural setting: study protocol for participatory action research. *Health Education*, ahead-of-p(ahead-of-print). <https://doi.org/10.1108/HE-06-2020-0045>
- Urrohmah, N. (2021). *Determinants of Smoking Behavior as an Effort to Realize a Smoke-Free Young Generation at Al-Khairiyah 1 Cilegon High School in 2021* [Bhakti Kencana University]. <http://repository.bku.ac.id/xmlui/handle/123456789/2997>
- WHO Indonesia. (2020). *Statement: World No Tobacco Day 2020*. <https://www.who.int/indonesia/news/detail/30-05-2020-pernyataan-hari-tanpa-tembakau-sedunia-2020>
- World Health Organization. (2017). *WHO report on the global tobacco epidemic, 2017: Monitoring tobacco use and prevention policies*. In World Health Organization. <https://apps.who.int/iris/bitstream/handle/10665/255874/9789241512824-eng.pdf>
- Yulviana, R. (2015). Factors Related to Smoking Habits in Adolescent Boys in Grades X and XI at SMA Negeri 6 Pekanbaru. *Journal of Community Health*, 2(6), 278–282. <https://doi.org/10.25311/keskom.vol2.iss6.89>