Why Preadolescent Smoke? Intention and Smoking behavior of elementary students in a Rural Area in Central Java

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Abstract. The prevalence of child smokers (10-18 years) increased by 26% from 7.2% (2013) to 9.1% (2018). The GYTS 2019 reported that 39.6% of students aged 13-15 years had smoked (boys 67.7% and girls 12.8%). The school-based health survey in 2015 found that male students started smoking for the first time before age 13. In Grobogan Regency, the age started smoking under 19 years was 69.64%, and even those who began smoking under 15 years was 12.8%. This research aims to determine the causes of smoking intention and behavior in preadolescents (9-12 years old) in the Penadaran Village area, Grobogan District, Central Java. This study used an observational design with a cross-sectional approach. The population is all 5th-grade elementary school students in Penadaran Village. The respondents were students in three public elementary schools in the research area and were permitted by parents to participate in the research, which included a total of 83 students. Data were collected using self-administered questionnaires guided by researchers. Data analysis with Chi-Square ($\alpha = 0.05$). The respondents who had the intention to smoke and ever smoked were 37.3%. The percentage of current smokers was 8.4%. Variables related to smoking intention were Tobacco Advertising Promotion and Sponsorship (TAPS) exposures, attitude, expectation, enforcement from friends, and availability of cigarette sellers around the school. Factors related to the smoking trial were gender and friend's reinforcement. Furthermore, only the intention to smoke was correlated to current smoking. Environmental influences such as TAPS exposure, peers, and availability of cigarettes should be controlled to prevent smoking in children.

Keywords: intention, smoking behavior, preadolescent, rural area

A. Khoironi et al. (eds.), *Proceedings of the International Seminar and Workshop Public Health (ISWHOPHA 2023)*, Advances in Health Sciences Research 75,
https://doi.org/10.2991/978-94-6463-421-1_26

1 Introduction

Indonesia is the three third greatest country in the world, with an absolute increase in the number of deaths attributable to tobacco smoking between 1990 and 2019 (from 112,800 deaths in 1990 to 246,400 deaths in 2019, a 118% increase). (1) The Global Adults Tobacco Survey in Indonesia (15 years old and older) reported that the current tobacco use and current tobacco smoking prevalences did not significantly change from 2011 to 2021. The current tobacco use in 2011 and 2021 were 36.1% and 34.5% (65,5% of men and 3.3% of women), respectively, and the prevalences of current tobacco smoking in 2011 and 2021 were 34.8% and 33.5% (64.7% of men, and 2,3% of women), respectively. (2–4)

However, the prevalence of children (10-18 years old) smokers increased significantly from 7.2% in 2013 to 9.1% in 2018, which is double the national target to reduce it to 5.4% (5,6). The National School-based Health Survey found that 21.47% of the students were smokers, while 17.32% of all students and 32.82% of male students started smoking for the first time when they were less than 13 years old. The 2019 Global Youth Tobacco Survey (GYTS) on students aged 13-15 in Indonesia showed that 39.6% of students (67.7% of males and 12.8% of females) had ever smoked. The current tobacco smokers among students were 18.8% (35.5% males and 2.9% females). (7)

There are many factors related to smoking behaviors among adolescents. The comprehensive discussion that includes factors related to intention and smoking behavior is The Theory of Triadic Influence (TTI)(8–11), which integrates many variables from various sociological and psychological theories in behavior change. TTI explains smoking behavior and intention to smoke are influenced by three groups or streams: the personal stream, the social stream, and the environmental stream. Each stream leads to self-efficacy (12–14), social normative belief (10,15–18), and attitudes (12,15,18,19), respectively, which influence the intention to smoke. (20–22) Social normative belief is formed by social or interpersonal variables, such as friends (23,24) and parents' smoking behavior. (17,23,25,26) The attitude is shaped by expectation (14,27) and opportunities, for example, availability and affordability of cigarettes (26), and Tobacco Advertising Promotion and Sponsorship (TAPS) exposures. (19,25,26,28)

Regarding the TAPS exposures, media literacy is one variable that influences intention and smoking behavior. TAPS may be more decisive in encouraging adolescents to initiate smoking than exposure to peer or family smokers or socio-demographic variables. (28) Non-smoker adolescents who are exposed to cigarette advertisements or accept them are more likely to try cigarettes and become smokers in the future. (29) The perception that cigarette advertising targets adolescents, attitudes towards TAPS, and the possibility of smoking are consistently associated with smoking status. (19) Exposure to smoking-related media correlated with smoking behavior, likelihood, and intention to smoke in the future. (30–32)

The students participating in GYTS noticed tobacco advertisements or promotions at points of sale (65.2%), while 56.8% noticed someone using tobacco on television, videos, or movies. A school-based survey of 2820 students (13-18 years old) in seven cities in Indonesia found that children exposed to high online TAPS on Instagram (29.6%) and high offline TAPS via television (74.0%), billboards (54.4%), and live music events (46.2%). (33) In Semarang City, where this research was conducted, children were highly exposed to outdoor tobacco advertising. The mapping of 3,453 tobacco advertisements in Semarang City found that as many as 2,556 (74%) were within 300 m of schools, and a total of 378 schools (39%) were in the high density of tobacco advertising. (34) Another study revealed that students at schools with a medium and high density of outdoor tobacco advertising were up to 2.16 times more likely to smoke compared to those with low density. (35) Several studies have shown that the higher the Smoking Media Literacy (SML), the lower the smoking behavior and the possibility of becoming a smoker in the future, which is also low. (36–39)

This research was located in the Grobogan District, Central Java Province, since the proportion of smokers in the age group ≥10 years was 23.78%, smokers who started smoking before 19 years old were 69.64%, even 12.8% started smoking at the age of under 15 years. The proportion of children who first tried smoking was 10-14 years old (14.26%), while 15-19 years old was (54.08%). The average cigarette consumption by each smoker is 11.68 cigarettes/day. The proportion of indoor smoking behavior among smokers is very high (89.21%) and causes 68.72% of Grobogan residents to be exposed to cigarette smoke, including children. (40) Penadaran Village represented the rural area in the Grobogan district, located 30 km from the Grobogan district center. The Penadaran Village intended the Child-Friendly Village Program, which should have tobacco control and smoking prevention programs for children.

This research aims to determine the causes of smoking intention and behavior in preadolescents in the Penadaran Village area, Grobogan District, Central Java. The fifth grade (9-12 years old) was selected as respondents to represent the preadolescent population.

2 Methods

This study used an observational design with a cross-sectional approach. The population is all 5th-grade elementary school students in Penadaran Village. The respondents were students in three public elementary schools in the research area and were permitted by parents to participate in the research, including 83 students. Data were collected using self-administered questionnaires guided by researchers.

The questionnaires contained thirteen variables. The demography characteristics (gender and age), TAPS exposures (12 questions), media literacy (9 questions) (41), attitude (7 questions) (41), subjective norm (3 questions) (41), self-efficacy (4 questions)(12), expectation (6 questions) (14), smoking parent (Yes-No question),

smoking friend (Yes-No question), availability of cigarettes around school and home(Yes-No question), smoking intention (3 questions), and smoking behavior. The total scores of perceptual variables, such as attitude, media literacy, subjective norm, self-efficacy, and expectation, were categorized as Low and High with the median cut of point. The intention to smoke was categorized as "No" if all the questions answered absolutely No. If there were one or more questions answered, "Yes", "Maybe Yes," or "Maybe N,o," the intention was coded as "Yes." Data analysis with Chi-Square and Fisher Exact test ($\alpha = 0.05$).

3 Results

Table 1. The relationship between TAPS exposure, media literacy, Attitude, subjective norm, self-efficacy, Expectation, smoking parents, friend reinforcement to smoke, intention, and smoking behavior.

Independent variable	Category	f	%
Gender	Male	38	45.8
	Female	45	54.2
Age	9-10	72	86.7
	11-12	11	13.3
TAPS exposures	Television	72	86.7
	Radio	8	9.6
	Internet	47	56.6
	Social media	34	41.0
	Billboard	76	91.6
	Banner	77	92.8
	Neonbox	61	73.5
	Flags	35	42.2
	Poster/sticker	78	94.0
	Point of Sales	80	96.4
	Merchandise	13	15.7
	Event sponsored by cigarette	33	39.8
Have smoker parent	Yes	66	79.5
	No	17	20.5
Friend	Yes	26	31.3
	No	57	68.7
There are cigarette sellers	Yes	27	32.5
around the school	No	56	67.5
There are cigarette sellers around	Yes	70	84.3
the home	No	13	15.7
Intention to smoke	Yes	31	37.3
	No	52	62.7
Ever smoke	Yes	31	37.3
	No	52	62.7

Independent variable	Category	f	%
Current smoke	Yes	7	8.4
	No	76	91.6

The research results showed that more students were female (54.2%), aged 10-12 years. Children's exposure to cigarette advertising, promotions, and sponsorship massively. They knew of cigarette advertisements in many places, outdoors and online. The highest exposure of cigarette advertising to students was from point of sale (96.4%), followed by posters/stickers (94.0%), banners (91.8%), billboards (91.6%), television (86.7%), neon boxes (73, 5%), internet (56.6%), social media (41.0%), and attending cigarette sponsored events (39.8%).

The reinforcing factors around students who could influence students to smoke were smoking parents (79.5%) and friends (31.3%). In rural areas, many stalls or shops sell cigarettes. The cigarette sellers were more around their house (84.3%) than the school (32.5%).

The intention, smoking trial, and current smoking in the students were high. The intention to smoke was found in 37.3% of the students, as the same number of the ever-smoke (37.3%). Furthermore, the percentage of current smokers among students was 8.4%.

Table 2. The relationship between TAPS exposure, media literacy, Attitude, subjective norm, self-efficacy, Expectation, smoking parent, Friend reinforcement to smoke, intention, and smoking behavior.

Independent variable	Category	Intention to Smoke			Ever smoked			Current smoking		
		Yes f (%)	No f (%)	p-value	Yes f (%)	No f (%)	p-value	Yes f (%)	No	p-value f (%)
Gender	Male	18 (47.4)	20 (52.6)	0.083	27 (71.1)	11 (28.9)	0.000*	7 (25.9)	20 (74.1)	0.550
	Female	13 (28.9)	32 (71.1)		4 (8.9)	41 (91.1)		0 (0.0)	4 (100)	
Age (years)	9-10	26 (36.1)	46 (63.9)	0.551	27 (37.5)	45 (62.5)	0.942	5 (18.5)	22 (81.5)	0.212
	11-12	5 (45.5)	6 (54.5)		4 (36.4)	7 (63.6)		2 (50.0)	2 (50.0)	
TAPS Exposure	Low	14 (26.4)	39 (73.6)	0.006*	17 (32.1)	36 (67.9)	0.187	3 (17.6)	14 (82.4)	0.469
	High	17 (56.7)	13 (43.3)		14 (46.7)	16 (53.3)		4 (28.6)	10 (71.4)	
Media Literacy	Low	16 (32.0)	34 (68.0)	0.215	20 (40.0)	30 (60.0)	0.539	5 (25.0)	15 (75.0)	1.000
	High	15 (45.5)	18 (54.5)		11 (33.3)	22 (66.7)		2 (18.2)	9 (81.8)	

Independent variable	Category	Intention to Smoke			Ever smoked			Current smoking		
		Yes f (%)	No f (%)	p-value	Yes f (%)	No f (%)	p-value	Yes f (%)	No	p-value f (%)
Attitude	Low	14 (60.9)	9 (39.1)	0.006*	6 (26.1)	17 (73.9)	0.189	2 (33.3)	4 (66.7)	0.596
	High	17 (28.3)	43 (71.7)		25 (41.7)	35 (58.3)		5 (20.0)	20 (80.0)	
Subjective Norm	Low	12 (46.2)	14 (53.8)	0.263	6 (23.1)	20 (76.9)	0.069	2 (33.3)	4 (66.7)	0.596
	High	19 (33.3)	38 (66.7)		25 (43.9)	32 (56.1)		5 (20.0)	20 (80.0)	
Self-efficacy	Low	19 (38.0)	31 (62.0)	0.880	20 (40.0)	30 (60.0)	0.539	3 (15.0)	17 (85.0)	0.210
	High	12 (36.4)	21 (63.6)		11 (33.3)	22 (66.7)		4 (36.4)	7 (63.6)	
Expectation	Low	19 (50.0)	19 (50.0)	0.029*	12 (31.6)	26 (68.4)	0.318	1 (8.3)	11 (91.7)	0.201
	High	12 (26.7)	33 (73.3)		19 (42.2	26 (57.8)		6 (31.6)	13 (68.4)	
Smoking Parent	Yes	21 (31.8)	45 (68.2)	0.040*	25 (37.9)	41 (62.1)	0.844	6 (24.0	19 (76.0)	1.000
	No	10 (58.8)	7 (41.2)		6 (35.3)	11 (64.7)		1 (16.7)	5 (83.3)	
Friend reinforce to smoke	Yes	16 (61.5)	10 (38.5)	0.002*	22 (84.6)	4 (15.4)	0.000*	5 (22.7)	17 (77.3)	1.000
	No	15 (26.3)	42 (73.7		9 (15.8)	48 (84.2)		2 (22.2)	7 (77.8)	
There are cigarette sellers around the school	Yes	16 (59.3)	11 (40.7	0.004*	13 (48.1)	14 (51.9)	0,158	2 (15.4)	11 (84.6)	0.667
	No	15 (26.8)	41 (73.2		18 (32.1)	38 (67.9)		5 (27.8)	13 (72.2)	
There are cigarette sellers around the home	Yes	25 (35.7)	45 (64.3	0.475	25 (35.7)	45 (64.3)	0.475	6 (24.0)	19 (76.0)	1.000
	No	6 (46.2)	7 (53.8)		6 (46.2)	7 (53.8)		1 (16.7)	5 (83.3)	
Intention to smoke	Yes	-	-	-	14 (45.2)	17 (54.8)	0.256	6 (42.9)	8 (57.1)	0.028*
	No	-	-		17 (37.3)	52 (62.7)		1 (5.9)	16 (94.1)	

Table 2 shows that only the intention to smoke was correlated to current smoking (p-value 0.028). The smoking trial (ever smoking) was associated with gender (p-value 0.000) and reinforcement to smoke from friends (p-value 0.000). Male students have a

higher probability to try smoking (71.1%) compared to females (8.9%), and having friends who reinforce to smoke made students more likely to try smoking (84.6%) compared to those who do not have (15.8)

The students intending to smoke more were males (47.4%) and students with smoking friends (61.5%). The variables associated with smoking intention were TAPS Exposure (p-value 0.006), attitude (p-value 0.006), expectation (p-value 0.029), smoking parent (p-value 0.040), friend reinforcement (p-value 0.002) and the availability of cigarette seller around the school (p-value 0.004).

4 Discussion

The research on smoking behavior in preadolescence (elementary students) is essential since the age of smoking in Indonesia is getting younger (5,7). Surprisingly, although the age of the respondents is younger than the Health National Survey and Global Youth Tobacco Survey, the number of elementary students who tried to smoke in this survey is 37.3,% and the current smoking is 8.4%, which is almost the same as the other surveys. This implies that the smoking prevention program should start from an early age (preadolescent). The program should prevent the intention to smoke because it is a strong predictor of smoking behavior in the future. Factors that build the intention to smoke could come from cognitive or individual, interactional, and environmental factors. (9,22)

The environmental factor that could initiate smoking in children is TAPS exposure. The students were highly exposed to TAPS from outdoor tobacco advertising such as point of sales, posters/stickers, billboards, banners, and television. TAPS may be more decisive in encouraging adolescents to initiate smoking than exposure to peer or family smokers or socio-demographic variables. (28) Non-smoker adolescents who are exposed to cigarette advertisements or accept them are more likely to try cigarettes and become smokers in the future. (29). Exposure to smoking-related media correlates with experimental smoking, smoking behavior, likelihood, and intention to smoke in the future (29–32,42). Moreover, Tobacco marketing is more decisive in encouraging adolescents to initiate smoking than exposure to peer or family smokers or socio-demographic variables (28).

Having a friend who smoked was the strongest predictor of smoking experimentation. Initial receptivity to tobacco marketing increased the risk of smoking experimentation independently of having friends who smoke (25). Furthermore, the smoking behavior of people around preadolescents could influence children to try to smoke. Parental smoking, fraternal smoking, and best friends who smoke were the predicted factors of experimental smoking cigarettes by age eleven. Children with a best friend who smoked were over five times more likely to report experimentation with cigarettes compared with children with a non-smoking best friend (23), moreover, a study found that peers could increase the risk of smoking by 9.1 times in adolescents. (47) Qualitative research in West Jakarta found that the motives or factors driving late childhood smoking were friends, personal, family, and advertising factors. The friend factor is the most potent driving force for smoking behavior in children who are in the

late childhood period (43). In this survey, reinforcement from friends to smoke ke also associated with ever smoking without having the intention to smoke.

5 Conclusion

The study found that the smoking intention was associated with TAPS exposures, attitude, expectation, enforcement from friends, and availability of cigarette sellers around the school. The government should enact and implement the policy that protects children from tobacco initiation, such as the TAPS ban policy and prohibiting cigarette display in point of sales and selling cigarette to children. Furthermore, the educational intervention should include peers empowerment. Schools could develop programs like peer educators that empower children to share with their friends about healthty behavior and smoking prevention.

Acknowledgment

The authors acknowledge the Institute for Research and Community Service of Universitas Dian Nuswantoro for research funding.

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