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Examining the Smoking Levels of Junior High School Students in Semarang City, Indonesia

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Abstract

Background: The prevalence of active smokers in Indonesia remains high. Global Adults Tobacco Survey (GATS) on 2011 stated that Indonesia has the highest number of active smokers (67% male and 2.7% female). National Health Indicator Survey 2016 showed the number of male adolescent who smoke was 54.8%. The aim of this study was to examine the smoking levels of junior high school students in Semarang City in order to arrange improvement in behavioral changes through identifying the patterns of adolescent's smoking behavior.
Methods: This study used cross sectional study design. Samples were selected with simple random sampling technique, and 160 smokers who were junior high school students were obtained from 16 sub-districts in Semarang City. Data was analyzed using univariate and bivariate analysis.
Results: The result showed that the majority of the respondents were light smokers (90.0%) who smoke <5 cigarettes/day. The chi square test showed that pocket money to buy cigarettes (p=0.011) and the social interaction pattern (p=0.026) have correlation to students' smoking levels.
Conclusion: Most students start to smoke at the age of less than 12 years old with light smoking degree. It is correlated with the pocket money to buy cigarettes and the social interaction pattern.

Keywords: Cigarette, Smoking Behavior, Student, Junior High School

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Background

The result of Global Adults Tobacco Survey (GATS) in 2011 stated that Indonesia has the highest number of active smokers, consist of 67% male (57.6 million) and 2.7% female (2.3 million)[1].

Based on the Indonesian Population Census in 2010, the adolescent's population was 26.7%[2]. Generally, Indonesian adolescent tried to smoke for the first time before 18 years old. The smoking behavior among adolescent has become apprehensive since data showed the number of active smokers are increasing and the age of first time smoking is getting younger[3]. The Ministry of Health stated that Indonesia is facing a serious thread due to the escalation of the number of smokers, especially in children and adolescent age group. Based on National Basic Health Research (Riskesdas) in 2013, the proportion of >15 years old who smoke and chew tobacco was increasing[4]. The data of Riskesdas 2007 showed 34.2%, Riskesdas 2010 showed 34.3%, and Riskesdas 2013 showed 36.3%. The adolescent smokers aged 15-19 years old increased two times fold from 12.7% in 2001 became 23.1% in 2016[4–6]. The result of National Health Indicator Survey (Sirkesnas) in 2016 showed the prevalence of male adolescent has reached 54.8%[7].

Based on the preliminary studies above, this research aimed to examine the smoking levels of junior high school students in Semarang City in order to arrange improvement in behavioral changes through identifying the patterns of adolescent's smoking behavior.

Methods

This research was a quantitative research using survey research method conducted in 2018. The research design was cross sectional. The target population in this research was students of all junior high school in Semarang City. Accessible population in this research was students from one chosen junior high school in each sub-district in Semarang City.

There were 16 sub-districts in Semarang City, it means the samples of this research were students from 16 junior high school. The total samples were 160 students of junior high school who were identified as active smokers. There were 10 samples from each of 16 schools. Samples were chosen by using simple random sampling technique. Data were collected through interview by using questionnaire. Data were analyzed by using univariate through frequency distribution analysis and bivariate by using Chi Square.

Ethical clearance was obtained from Faculty of Public Health, Diponegoro University, with the study protocol code of number : 221/EA/KEPK-FKM/2018. The committee is in compliance with the Declaration of Helsinki, International Conference on Harmonization Guidelines, Good Clinical Practice Standards, Council for International Organizations of Medical Sciences Guidelines, World Health Organization Standards and Operational Guidance for Ethics Review of Health-Related Research and Surveying and Evaluating Ethical Review Practices, Institutional Review Board Standard Operating Procedures and Local Regulations and Standards in Ethical Review.

Results and Discussion

Socio-demographic characteristics

Data were analyzed from 160 samples. All of the samples were active smokers who were junior high school students. The socio-demographic characteristics consist of age, grade, daily pocket money, the source of pocket money, the sum of pocket money to buy cigarette, and age to start smoking. Table 1 showed that most of the respondents were ≥14 years old (62.5%) and were in 7th grade (39.4%).

Most of the respondents have daily pocket money ≥ Rp 10,000 (88.1%) and as much as 98.7% of the respondents get the pocket money from parents. As a comparison, the value of Rp 10,000 in Indonesia can get 1kg of rice or 0.5kg of eggs. Table 1 also shows that more than half of the respondents spent their money on cigarette for >Rp 3,000 (57.5%) per day. Last but not least, most of the respondents started to smoke at the age of ≤12 years old (70.0%).

Table 1 : Respondents' socio-demographic characteristics

Variables	Number	
	F	%
Age		
a. <14 years old	60	37.5
b. ≥14 years old	100	62.5
Grade		
a. 7th grade	63	39.4
b. 8th grade	60	37.5
c. 9th grade	37	23.1
Daily pocket money		
a. <Rp 10,000	19	11.9
b. ≥Rp 10,000	141	88.1
Source of pocket money		
a. Parents	158	98.7
b. Relatives	2	1.3
Pocket money to buy cigarette		
a. ≤Rp 3,000	68	42.5
b. >Rp 3,000	92	57.5
Age to start smoking		
a. ≤12 years old	112	70.0
b. >12 years old	48	30.0

Smoking behavior among junior high school students

This study divided the degree of smoking behavior into two categories; they are light smoker early adolescent and heavy smoker early adolescent.

Table 2: Frequency distribution of smoking levels of junior high school students in Semarang City

Degree of smoking behavior	Number	
	f	%
Light smoker early adolescent (<5 cigarettes/day)	144	90.0
Heavy smoker early adolescent (≥5 cigarettes/day)	16	10.0
Total	160	100.0

The category of light smoker early adolescent defined as smoking <5 cigarettes per day. While the category of heavy smoker early adolescent defined as smoking ≥5 cigarettes per day. Based on the findings that is shown in table 2, the majority of respondents have light smoking levels (90.0%), which on average smoke <5 cigarettes/day.

Table 2 shows the majority of respondents (90.0%) were light smokers (<5 cigarettes/day), while the rest (10.0%) were heavy smokers who smoke ≥5 cigarettes/day.

In the theory of PRECEED PROCEED of Lawrence Green, health behavior could be influenced by predisposing factors, enabling factors, and reinforcing factors. The same as smoking behavior which can be influenced by internal factors (predisposing) and external factors (enabling and reinforcing)[8].

Based on the interview result, there were some reasons found including internal and external factors of why adolescent smoking. Some of the reasons were being curious (57.5%), invited by friends (46.9%), and imitating the closest environment (5.0%). The reason why respondents were being curious was because adolescent tend to look for their identity by trying to do many things. The reasons of invited by friends and imitating the closest environment depict that social support is contributing to adolescent's smoking behavior. A research by Hedman in Sweden found that family such as father (p-value<0.001 OR=1.74), mother (p-value<0.001 OR=2.28), or other family members (p-value=0.001 OR=5.26) can increase the probability of smoking behavior among adolescent[9]. Family's behavior toward cigarette can be a protection factor toward adolescent's smoking behavior[10]. The variable of friends that is defined as social interaction has an important role to adolescent, because in this age period children started to adapt with the environment from their peer group[11].

This research also found that respondents got cigarette by buying themself with their pocket money (81.9%), got from friends (56.3%), got from parents (2.5%), and got from other families (1.9%). This is very unfortunate if their access to get cigarette is so easy. Worst is that they can get it from their parents.

The cigarette that usually consumed by the respondents are filter type (100%). In detail respondents explained that they have tried some of these type : clove cigarette (18.8%), filter cigarette (100.0%), roll-your-own tobacco (7.5%), vapor (61.3%) and shisha (12.5%). Respondents also mentioned the brand of cigarettes that they have tried : A Mild

(6.3%), Sampoerna filter (17.5%), Djarum Super (35.6%), Gudang Garam Filter (76.3%), and other brands (23.7%).

Bivariate analysis

The independent variables in this study are age, daily pocket money, daily pocket money to buy cigarette, age to start smoking, knowledge, attitude toward cigarette, social interaction pattern, and family's behavior.

Table 3 showed that respondents' knowledge almost have the same percentage between bad and good category (50.6% and 49.4% respectively). As much as 52.5% respondents have permissive attitude toward cigarette. More than half respondents have supportive social interaction pattern toward smoking (55%), which means respondents' friends were either smokers or not being strict to cigarette. As much as 40.6% respondents stated that their family's behavior were supportive toward smoking. This is very unfortunate to know that more than 40% of respondents' family were either smokers or not being strict to cigarette.

As shown in table 3, the chi square test result showed that there were two variables that have relationship with smoking levels; they are daily pocket money to buy cigarette and social interaction pattern.

Table 3 : Bivariate analysis using chi square

Variable	Category	f	%	Smoking levels				p value
				Light smoker		Heavy smoker		
				f	%	f	%	
Age	<14 years old	60	37.5	55	91.7	5	8.3	0.586
	≥ 14 years old	100	62.5	89	89.0	11	11.0	
Daily pocket money	< Rp 10,000	19	11.9	18	94.7	1	5.3	0.463
	≥ Rp 10,000	141	88.1	126	89.4	15	10.6	
Daily pocket money to buy cigarette	≤ 3000	68	42.5	66	97.1	2	2.9	0.011
	>3000	92	57.5	78	84.8	14	15.2	
Age to start smoking	≤ 12 years old	112	70.0	99	88.4	13	11.6	0.301
	>12 years old	48	30.0	45	93.8	3	6.3	
Knowledge	Bad	81	50.6	76	93.8	5	6.2	0.102
	Good	79	49.4	68	86.1	11	13.9	
Attitude toward cigarette	Strict	76	47.5	72	94.7	4	5.3	0.057
	Permissive	84	52.5	72	85.7	12	14.3	
Social interaction pattern	Discouraging	72	45.0	69	95.8	3	4.2	0.026
	Supportive	88	55.0	75	85.2	13	14.8	
Family's behavior	Discouraging	95	59.4	87	91.6	8	8.4	0.421
	Supportive	65	40.6	57	87.7	8	12.3	

Respondents' age

Based on the result of cross tabulation, it showed that respondents with heavy smoking behavior mostly found in the age of ≥ 14 years old (11.0%) compared to those in the age of <14 years old (8.3%). The result of chi square test showed p=0.586 which means there is no significant relationship between age and smoking levels of respondents.

This research is in line with Simarmata's research which found that there was no relationship between age and smoking behavior p = 0.101[12]. It is also in line with Rahayuningsih's research that showed there was no relationship between respondents' age and smoking behavior among students in "X" Vocational High School p = 0.660[13].

Daily pocket money

Based on cross tabulation result, it was found that respondents with heavy smoking levels were mostly found among respondents who have pocket money ≥ Rp 10,000/day. The result of chi square test showed p=0.463 which means there is no relationship between daily pocket money with smoking levels.

This research is in line with Purba's research which found that there was no relationship between respondents' daily pocket money with smoking behavior p=0.629[14].

Money to buy cigarette per day

The result of cross tabulation showed that respondents with heavy smoking behavior mostly found in the group of respondents who spent > Rp 3,000/day (15.2%) compare to the group of respondents who spent ≤ Rp 3,000/day (2.9%). The result of chi square test showed p = 0.011 which means there is a relationship between daily pocket to buy cigarette per day with respondents' smoking levels.

This result is in line with Yulviana's research which proved that there was a relationship between pocket money and smoking behavior (p=0.031). Yulviana's research also found that adolescent who have enough pocket money to buy cigarette has 2.33 times the risk of having smoking behavior compared to adolescent whose pocket money did not used to buy cigarette[15].

Age to start smoking

The result of cross tabulation showed that respondents with heavy smoking levels were mostly found at the group who started to smoke at the age of ≤ 12 years old (11.6%) compared to the group who started to smoke at the age of > 12 years old (6.3%). The chi square test result showed p=0.301 which means there is no significant relationship between the age to start smoking with smoking levels.

This research is in line with Widianti's research which found that there was no significant relationship between age and smoking behavior (p=0.493)[16].

Knowledge about cigarette

Based on the cross tabulation result, it was found that respondents with heavy smoking levels mostly found in respondents with good knowledge (12.9%) compared to respondents with bad knowledge (6.2%). The chi square test result showed p=0.102 which means that there is no significant relationship between knowledge about cigarette and smoking levels.

This result is in line with the research of Binita et al. Which showed that there was no relationship between respondents' knowledge about cigarette and the type of smoking behavior among students from "X" Vocational High School in Semarang City with p=0.387[17]. This research also in line with Pradana's result that showed there was no relationship between knowledge level with adolescent attitude toward smoking with p=0.070[18].

Attitude toward cigarette

Based on the cross tabulation result, respondents with heavy smoking levels mostly found in the group of respondents who have permissive attitude toward cigarette (14.3%) compared to the group of respondents who have strict attitude toward cigarette (5.3%). The chi square test showed p=0.057 which means there is no significant relationship between attitude toward cigarette with smoking levels.

This result is the contrary to the research of Baharuddin in Mariorowawo Senior High School, Makassar. Baharuddin found that attitude has strong correlation with adolescent smoking behavior (p=0.000)[19]. It is also the contrary to the PRECEED PROCEED theory of Lawrence Green which stated that attitude is one of predisposing factor in a behavior[8].

Social interaction pattern

Social interaction pattern defined as the social interaction between respondents with their friends which has been established relatively long. The cross tabulation result showed that respondents who have heavy smoking levels mostly found in the group of those whose social interaction is supportive to smoke (14.8%) compared to the group of those whose social interaction is discouraging to smoke (4.2%). The chi square result showed p=0.026 which means there is a relationship between social interaction pattern with smoking levels.

This result is in accordance with Baharuddin's research which showed that there was a relationship between friends who smoke with adolescent smoking behavior with p=0.001[19]. A cross-sectional study among youths in Hungary by David and Andrade showed that 48% respondents reported peer pressure as the main factor that made youth to use

tobacco[20]. Even Chalela et.al showed that the strongest predictor to predict smoking behavior among adolescent is how many friends who smoke in their social interaction[21]. It is also consistent with Liao's research which found that there was a significant relationship on the influence from friends with adolescents' cigarette use. However, the effect of friends' cigarette use was generally higher during junior high school compared to high school[22]. It is also in line with the theory of Lawrence Green which stated that behavior is determined by three major factors, one of them is reinforcing factors such as the influence of closest friends[8].

Alamsyah also explained that the more adolescent smoker, the bigger the probability of their friends became smoker as well. This could be seen from two possibilities. First, those adolescent influenced by their friends. And second, those adolescent influencing their friends, so in the end everyone became smoker[23].

Family's behavior

The result of cross tabulation showed that respondents with heavy smoking levels were mostly found in the family who support smoking behavior (12.3%) compared to those in the family who discourage smoking behavior (8.4%). The chi square test showed p=0.421 which means there is no significant relationship between family's behavior and smoking levels.

This result is consistent with Widianti's research, which found that there was no significant relationship between family's behavior with smoking behavior (p=0.522)[16]. Liem's research also found that parents' behavior did not related to adolescents' smoking behavior. However, on the contrary, Liem also found that relatives' and other family member's behavior have relationship with adolescents' smoking behavior[24]. Liao (2013) also found that parents have an important role in the increasing trend in early cigarette smokers among the junior high school period. It showed that the magnitude of parental effect started to decrease at 10th grade or early senior high school[22]. This could be an alarm to parents that the new trend nowadays is that friends tend to have bigger influence rather than parents among early adolescent.

Conclusion

Most of the respondents started to smoke at the age of less than 12 years old (70%). The majority of respondents in this research is light smoker (90.0%) who smoke <5 cigarettes per day. Variables that have relationship with smoking levels are : pocket money to buy cigarette (p=0.011) and social interaction pattern (p=0.026). Variables that do not have relationship with smoking levels are : age (p=0.586), daily pocket money (p=0.463), age to start smoking (p=0.301), knowledge of cigarette (p=0.102), attitude toward cigarette (p=0.057), and family's behavior (p=0.421).

Health Department should promote healthy life without smoking to schools, especially to junior high schools in Semarang City, in order to improve students' knowledge and awareness. Besides, to reduce the number of smokers among junior high school students, Health Department can collaborate cross-sectors such as with the Police Department or with Civil Service Police Unit to raid junior high school students who smoke outside school as a form of social punishment which will cause a deterrent effect to those who smoke.

Schools need to deliver subject matter related to cigarette to students at school. Besides, teachers can guide students and help them to initiate an adolescent no-smoking peer group.

It is necessary to improve parental supervision to avoid children from smoking. Besides, it is also necessary to improve parental awareness to not introduce cigarette to their children under 18 years old and give good examples by not smoking in front of children.

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