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Factors associated with smoking behaviour among Indonesian students: Analysis of the 2019 Global Youth Tobacco Survey

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ABSTRACT

Background and purpose: The smoking prevalence in youths aged 10-18 years in Indonesia increased from 7.2% in 2013 to 9.1% in 2018. The aim of this study was to assess factors related to smoking behavior among students in Indonesia.
Methods: This is a secondary analysis of the 2019 Global Youth Tobacco Survey (GYTS) Indonesia data. The sampling technique used was two-stage cluster sampling, classified by schools and classes. The samples included in this analysis were all students aged 13-15 years who participated in the survey and have complete data, accounted for 9,789 respondents. The data were analysed with the Chi-Square Test and Logistic Regression with a 95% confidence interval and p value of 0.05.
Results: A total of 3,595 students (36.72%) had smoked. The number of respondents was the most in the age group of 13-15 years (51.43%). The number of male respondents was 44.01% and women 55.99%. Most students (90.29%) had seen cigarette advertisements, 55.88% of them saw people smoking in school areas and 46.88% saw teachers smoking at schools. The results of a multivariate analysis found factors affected smoking behaviour in students were the friend's offer to smoke (AOR=10.69; 95%CI: 7.37-15.50), male gender (AOR=13.94; 95%CI: 11.56–16.81) and presence of people smoking in the house (AOR=2.15; 95%CI: 1.88-2.45).
Conclusion: Environmental cues and peer pressure are associated with smoking among students. Optimizing smoke free and health education about the dangers of cigarettes is essential to counteract the extensive exposure to environmental influence to smoking.

Keywords: Cigarettes, student, Global Youth Tobacco Survey, non-smoking area, school

INTRODUCTION

The tobacco epidemic is one of the greatest public health threats the world has ever faced, killing more than 8 million people a year worldwide. More than 7 million of these deaths resulted from direct tobacco use while about 1.2 million were non-smokers exposed to second-hand smoke (SHS). More than 80% of the world's 1.3 billion tobacco users live in low- and middle-income countries.[1] One of the 3rd Sustainable Development Goals (SDGs) related to health is to strengthen the implementation of the WHO Framework Convention on Tobacco Control (FCTC) in all countries.[2]

The 2025 target of the WHO Global Plan of Action for the Prevention and Control of Non-Communicable Diseases (NCDs) stipulated those countries to strive to achieve a 30% reduction in the prevalence of tobacco use to 19.1% for the total population aged 15 years and over, 30.2% for men and 8.0% for women.[3] On the other hand, smoking prevalence in adolescents continues to increase. Globally, there are 6.5% (24 million) adolescents aged 13-15 years of which 17 million boys (9%) and 7 million girls (4%) have a smoking habit. Southeast Asia has the most significant number of child smokers (6.4 million or 27% of the global total).[3]

Data from the Indonesia Basic Health Survey *(Riskesdas)* shows an increase in the prevalence of smoking in adolescents aged 10-18 years from 7.2% in 2013 to 9.1% in 2018. One indicator of the success of human resource development contained in the 2020-2024 National Medium-Term Development Plan (RPJMN) is the decline in the prevalence of smoking aged 10-18 years from 9.1 to 8.7 by 2024. Indonesia is the only country in Asia that has not ratified the FCTC.[4–6]

Several studies mentioned that adolescents exposed to SHS have been found to have higher probabilities of becoming smokers and increased of smoking initiation.[7] SHS exposure in the home and in public areas increases students' risk of being current smokers by four times.[8] As compared to non-smoking households without SHS exposure at home, living with siblings and other co-residing family members who smoked was strongly associated with higher likelihood of smoking.[9] The age of smoking initiation is also significantly related to status as a daily current smoker.[10] As high as 18.3% of Iranian students said they had ever tried or used cigarettes, with the prevalence of smoking was higher on male than female.[11] Ease of access to cigarettes and weak supervision of cigarette sales are factors that make smoking common in community especially in students.[12] Seeing someone smoking a cigarette in the school were associated with ever use of cigarettes (AOR=1.9; 95%CI: 1.1–3.4).[13]

This study tries to look more comprehensively at the factors that influence smoking behaviour in adolescents from the several aspects including SHS at home, public places and school, knowledge and attitudes of students regarding smoking, exposure to cigarette advertisements, and smoking status of parents, friends and teachers. Therefore, we can map factors associated with smoking behaviour in adolescent to support evidence to advocate for policies to prevent student from smoking.

METHODS

This was a secondary data analysis of the 2019 Global Youth Tobacco Survey (GYTS). [14] GYTS data is an open access data for the public which can be downloaded on the following page https://www.cdc.gov/tobacco/global/gtss/gtssdata/index.html. The GYTS was a school-based survey that uses a two-stage cluster sample design. The number of schools involved was 148 schools which are nationally representative with distribution in almost all provinces. Schools are selected according to the probability

proportional to the number of students. The class was selected randomly, and all students in the chosen class could take the survey. The survey uses standard core questions and a set of optional questions that can be adapted across countries to measure and track key tobacco control indicators. In Indonesia, GYTS was conducted by the Health Research and Development Agency, Ministry of Health (Balitbangkes). The GYTS used a standardized methodology by the US Center for Disease Control (CDC) for constructing sampling frames, selecting schools and classes, preparing questionnaires, carrying out field procedures and processing data. The total number of students who took the survey was 9.992 in grades 7-12, with a total response rate of 91.0%.[15]

The dependent variable was students' smoking behaviour based on the questionnaire's question No. 5, "Have you ever smoked or tried smoking even though it was only one or two puffs?". The answer "Yes" was categorized as students having smoking behaviour, and the answer "No" was classified as non-smoking students. The questionnaire was standardized by CDC and applied for tobacco use survey in several countries. The independent variables were SHS at home, public places and school, knowledge and attitudes about tobacco, exposure of cigarette advertisements, and status smoking of parent, friends and teachers.

The sample's inclusion criteria for the analysis were students who had the answer based on the question number five. Missing data were removed for analysis, namely smoking status (184 data), age (13 data), and gender (6 data). The drop out missing data is very small and does not cause selection bias. Finally. the number of samples that met the requirements for analysis was 9.789 respondents.

The relationship between the dependent and independent variables were measured using the Chi Square Test. Independent variables with not significant p values (above 0.05) were not included as variable candidates in the multivariate test. Multivariate analysis was performed by using Logistic Regression Test with backward method. All significant variables in the bivariate analysis were entered into the model, then the insignificant variables were excluded one by one to obtain a final model with a p value <0.05.

RESULT

Based on Table 1, of the 9.789 students, more than a third (3.595/36.72%) had smoked, with the highest proportion was in students aged 16 years and over as much as 1.207 (38.35%), and male students who were smoked were 2.947 (68.41%), more than the female. Most of the average weekly pocket money is around IDR 11.000–50.000. High exposure to second-hand smoke was reported at home (55.61%), in public places (58.07%), and school environment (55.88%). Majority of the students aware that other people's cigarette smoke is harmful (94.99%) and cigarettes are harmful to health (92.98%). The students' attitude was positive to support banning of smoking in public places (92.54%) and the prohibition of selling cigarettes (74.10%).

In the last 30 days, 78.28% of students had seen anti-smoking/health advertisements and 90.29% of students had seen cigarette advertisements. Based on environmental factors, there are parents of students who smoke (42.34%), students who accept offers of cigarettes from friends (10.53%), and students who saw teachers smoking in the school (46.88%).

The bivariate analysis results in Table 2 shows the risk of smoking increases with increasing student age. Students aged 16 years and over were 1.24 times and those aged 13-15 years have a 1.16 times higher chance to smoke compared to students aged 12 years and under. Then, the risk of smoking in male was higher by 16.14 times (95%CI: 13.23–19.70) than in female students.

Table 1. The Characteristics of respondents

Variables	Frequency (n=9,789)	Percentage (%)
Smoking status		
Smoking	3,595	36.72
Not Smoking	6,194	63.28
Age group (years)		
≤12	1,608	16.43
13–15	5,034	51.43
≥16	3,147	32.15
Gender		
Female	5,481	55.99
Male	4,308	44.01
Average weekly pocket money	2,537	25.92
<IDR 11,000		
IDR 11,000–50,000	4,928	50.34
>IDR 50,000	2,324	23.74
Second-hand smoke		
At home		
No	4,345	44.39
Yes	5,444	55.61
At public places		
No	4,105	41.93
Yes	5,684	58.07
At school		
No	4,319	44.12
Yes	5,470	55.88
Knowledge and attitudes		
Others' cigarette smoke is harmful		
Yes	9,299	94.99
No	490	5.01
Support for banning smoking in public places		
Yes	9,059	92.54
No	730	7.46
Increase the price of cigarettes		
Yes	6,270	64.05
No	3,519	35.95
Banning buying cigarettes as individual sticks (singles)		
Yes	7,254	74.10
No	2,535	25.90
Smoking is harmful to health		
Yes	9,102	92.98
No	687	7.02
Advertisement of cigarette		
Health messages or anti-smoking advertising		
Yes	7,663	78.28
No	2,126	21.72
Education about the harmful of cigarettes in school		
Yes	5,925	60.53
No	3,864	39.47
Cigarette's advertisement		
No	951	9.71
Yes	8,838	90.29
Social environment factors		
Parents smoking status		
No	5,644	57.66
Yes	4,145	42.34
Accept cigarettes offered by friends		
No	8,758	89.47
Yes	1,031	10.53
Teachers smoking in school		
No	5,200	53.12
Yes	4,589	46.88

Table 2 The relationship of independent variables with smoking behavior in students

Variables	Smoking Status n (%)		OR (95%CI)	p
	Smoking 3,595 (36.72)	Not Smoking 6,194 (63.28)		
Age group (years)				
≤12	536 (33.33)	1,072 (66.67)	1	
13–15	1,852 (36.79)	3,182 (63.21)	1.16 (1.00–1.34)	0.039*
≥16	1,207 (38.35)	1,940 (61.65)	1.24 (1.01–1.53)	0.040*
Gender				
Female	648 (11.82)	4,833 (88.18)	1	
Male	2,947 (68.41)	1,361 (31.59)	16.14 (13.23–19.70)	0.001*
Average weekly pocket money				
<IDR 11,000	934 (36.82)	1,603 (63.18)	1	
IDR 11,000–50,000	1,853 (37.60)	3,075 (62.40)	1.03 (0.93–1.14)	0.506
>IDR 50,000	808 (34.77)	1,516 (65.23)	0.91 (0.81–1.02)	0.137
Second-hand smoke				
At home				
No	1,071 (24.65)	3,274 (75.35)	1	
Yes	2,524 (46.36)	2,920 (53.64)	2.64 (2.33–2.99)	0.001*
At public places				
No	1,051 (25.60)	3,054 (74.40)	1	
Yes	2,544 (44.76)	3,140 (55.20)	2.35 (2.12–2.61)	0.001*
At school				
No	1,307 (30.26)	3,012 (69.74)	1	
Yes	2,288 (41.83)	3,182 (58.17)	1.67 (1.46–1.87)	0.001*
Knowledge and attitudes				
Others' cigarette smoke is harmful				
Yes	3,344 (35.96)	5,955 (64.04)	1	
No	251 (51.22)	239 (48.78)	1.87 (1.49–2.34)	0.001*
Support for banning smoking in public places				
Yes	3,291 (36.33)	5,768 (63.67)	1	
No	304 (41.64)	426 (58.36)	1.25 (1.06–1.47)	0.008*
Increase the price of cigarettes				
Yes	1,912 (30.49)	4,358 (69.51)	1	
No	1,683 (47.83)	1,836 (52.17)	2.08 (1.83–2.38)	0.001*
Banning buying cigarette as individual sticks (singles)				
Yes	2,134 (29.42)	5,120 (70.58)	1	
No	1,461 (57.63)	1,074 (42.37)	3.26 (2.83–3.76)	0.001*
Smoking is harmful to health				
Yes	3,229 (35.48)	5,873 (64.52)	1	
No	366 (53.28)	321 (46.72)	2.07 (1.69-2.54)	0.001*
Cigarette's advertisement				
Health messages or anti-smoking advertising				
Yes	2,737 (35.72)	4,926 (64.28)	1	
No	858 (40.36)	1,268 (59.64)	1.21 (1.08–1.36)	0.001*
Education about the harmful of cigarettes in school				
Yes	2,108 (35.58)	3,817 (64.42)	1	
No	1,487 (38.48)	2,377 (61.52)	1.13 (1.03–1.24)	0.010*
Cigarette's advertisement				
No	233 (24.50)	718 (75.50)	1	
Yes	3,362 (38.04)	5,476 (61.96)	1.89 (1.60–2.23)	0.001*
Social environment factors				
Parents smoking status				
No	1,971 (34.92)	3,673 (65.08)	1	
Yes	1,624 (39.18)	2,521 (60.82)	1.20 (1.07–1.33)	0.001*
Accept cigarettes offered by friends				
No	2,640 (30.14)	6,118 (69.86)	1	
Yes	955 (92.63)	76 (7.37)	29.12 (20.11–42.16)	0.001*
Teachers smoking in school				
No	1,558 (29.96)	3,642 (70.04)	1	
Yes	2,037 (44.39)	2,552 (55.61)	1.86 (1.63–2.12)	0.001*

*) Statistically significant association

Table 3 Independent factors associated with smoking behaviour among students in Indonesia

Variables	AOR (95%CI)	SE	p
Age group (years)			
≤12	1		
13–15	1.34 (1.14 – 1.58)	0.110	0.001*
≥16	1.73 (1.35 – 2.22)	0.214	0.000*
Gender			
Female	1		
Male	13.94 (11.56 – 16.81)	1.309	0.001*
SHS at home			
No	1		
Yes	2.15 (1.88 – 2.45)	0.142	0.001*
SHS at public places			
No	1		
Yes	1.36 (1.20 – 1.54)	0.085	0.001*
SHS at school			
No	1		
Yes	1.29 (1.12 – 1.48)	0.090	0.001*
Increase the price of cigarettes			
Yes	1		
No	1.24 (1.06 – 1.45)	0.096	0.006*
Banning individual sticks selling			
Yes	1		
No	1.46 (1.21 – 1.77)	0.138	0.001*
Health messages or anti-smoking advertising			
Yes	1		
No	1.20 (1.01 – 1.43)	0.104	0.035*
Accept cigarettes offered by friends			
No	1		
Yes	10.69 (7.37 – 15.50)	1.994	0.001*
Teachers smoking in school			
No	1		
Yes	1.22 (1.05 – 1.41)	0.091	0.009*

Students exposed to second-hand smoke at home have a 2.64 times higher risk of smoking and students who saw people smoking in public places have a 2.35 times higher chance of smoking compared to those who were not exposed. The knowledge of students who consider other people's cigarette smoke to be harmless has a risk of 1.87 times of smoking, and students who think that smoking is not harmful to their health are at risk of 2.07 times of smoking. Then the attitude of students who do not support the banning of smoking in public places (AOR=1.25; 95%CI: 1.06-1.47) and students who do not agree that the price of cigarettes should be increased have 2.08 times higher risk of smoking compared to those who agree that the price of cigarettes should be raised.

Students who did not see health messages/anti-smoking advertisements have a 1.21 times risk of smoking, while students who saw cigarette advertisements have a 1.89 times chance of smoking. Students who did not receive education about the harmful of smoking at school had a risk of 1.13 times higher. Students with smoking parents have 1.20 times higher chance of smoking than students whose parents do not smoke. Then students who accept offers of cigarettes from friends are at risk of 29.12 times to smoke, whilst students who saw teachers smoking in school are 1.86 times more likely to smoke.

Based on Table 3, multivariate analysis shows that the most influential factor in adolescent smoking behavior is being a male with an increased risk of 13.94 times (95%CI: 11.56–16.81) compared to female students. Then, the cigarette offered by friends with AOR=10.69; 95%CI: 7.37-15.50; p=0.001. It means that students who accept offers of cigarettes from friends have 11 times the risk of smoking compared to students who can refuse offers of cigarettes from their friends.

DISCUSSION

The high risk of smoking in male students is align with the National Basic Health Survey result. Male students have a likelihood of smoking 13.94 times higher than female. Similar figure was found in other study by Zahrani in which males daily smoke was four times higher compared to females.[16] It was also aligned with the situation in Nigeria where the prevalence of smoking in adolescents is higher in males than females.[17] Likewise in Myanmar among students aged 13-15 years, with 13.6% of students currently using tobacco; 26.3% were among males and 3.7% among females.[18]

The age of 13-15 years is vulnerable as adolescents are very easily influenced by the environment, such as peers.[19,20] Peers especially have a significant role in students because students spend more time with their peers, both at school and outside of school. In addition, high curiosity can also affect smoking behavior in students.[21] We found accepting cigarette offers from friends was ten times more likely to increase the chance of smoking among students. Similarly, previous research asserted that the peer environment is the highest predictor (38.4%) and has association with smoking behavior in adolescents.[22] This is also in line with the results of a study which states that friends who smoke are the most influencing factor for a student to smoke.[23] The peer environment has a vital role in the phase of a teenager's life. The need to be accepted and to avoid rejection from the group is very important for them. Teenagers do not want to be rejected and labelled as 'sissy' or 'cowardly.' Other research stated that students often get ridiculed if they do not want to be invited to smoke. Smoking has become a symbol of masculinity, power, and maturity that need to be embraced by teenagers.[24,25]

Green (1980) states three factors that influence an individual's health behavior are the predisposing factors related to knowledge, attitudes, beliefs, and others; the enabling factors related to infrastructure, resources, and others; and the reinforcing factors related to community leaders, family, peers, and others.[26] The environment can influence smoking behavior in students as a reinforcing factor. It can be parents who smoke, peers, and media that illustrates smoking behavior. Smoking families play a significant role in adolescent smoking behavior compared to non-smoking families.[21,22,27] A family member who smokes can significantly increase smoking intentions in the next five years.

In addition, the support of friends and relatives to become a smoker can substantially affect the likelihood of smoking.[28] In this study, students are generally exposed to cigarette advertisements that illustrate smoking enjoyment. It is also supported by the presence of people smoking in the surrounding environment both at home and school. The same condition in Myanmar that exposure to second-hand smoke at home, in closed public places, and in schools were reported at 33.2%, 28.4%, and 64.5%, respectively.

More than four of five students (83.4%) saw someone using tobacco on television, videos, or movies, and 42.3% paid attention to tobacco advertisements at the point of sale.[18] Ease of access to cigarettes for teenagers/students is also a motivating factor for smoking. Students in Southeast Asia Region reported buying cigarettes at shops/vendors in single sticks.[29] The weak supervision of cigarette sales to children and adolescents influence smoking, which means that the tobacco control laws need to be strengthened.[18] These factors lead to the increasing prevalence of smoking in adolescents.

Most of today's adult smokers start smoking in adolescence.[30] It is estimated that nearly 9 out of 10 adults who smoke cigarettes daily first tried smoking by age 18 years.[31] Conditions in the WHO Southeast Asia Region (SEARO) revealed that 8 out of 11 countries have more than 10% of adolescent students aged 13-15 years who smoked. More than half of daily smokers aged 20-34 started smoking "daily" before age 20. Then, 19% of the students aged 13-17 years in Bangladesh to 55% in Timor Leste tried their first cigarette before the age of 14.[32]

Tobacco was the top five leading risks contributing to health loss measured as DALYs in 2019 nationally and for all provinces.[33] A study in Malaysia found that most male adolescent smokers have at least one or more

cardiovascular risk factors.[34] Smoking behavior in adolescents causes not only immediate damage but also long-term adverse consequences. The earlier the tobacco were used, the more likely the smokers will be addicted due to nicotine.[35] The higher the sensitivity and vulnerability of children and adolescents to nicotine addiction, the earlier a person starts smoking and then the more likely they become addicted. Recognizing the difficulty of encouraging smokers to quit and preventing the initiation of smoking among adolescents is important to create supporting policies and actions to stem the overall tobacco epidemic.[32] Adolescents are the key to controlling NCDs epidemics in the future and achieving sustainable development targets (SDGs).[30]

The limitation of this study is the use of secondary data of survey only for students who were actively enrolled in school, hence, it is unable to explain the smoking behavior of teenagers who do not attend school.

CONCLUSION

Environmental factors are important determinants of smoking behavior in school aged children. School-based interventions and education about the harmful of smoking are needed to prevent the initiation and cessation of smoking in adolescents. Laws and regulations related to tobacco control must be enforced to limit the availability, accessibility and affordability of cigarettes. especially for teenagers. It is also essential to optimize the Smoking Free Area Law implementation in the school environment to minimise environmental exposure. Furthermore, ban of tobacco advertisement in all channels will reduce the environmental cues that lure children to smoke.

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AUTHOR CONTRIBUTION

DRF is the main contributor who conceptualized the study, identified the variables, analyzed data and determined the points to discuss. OP contributed to correcting the research methodology and NAN reviewed and compiled the discussion section.

CONFLICT OF INTEREST

There was no conflict of interest declared in this study.

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REFERENCES

1. WHO. Tobacco Key Fact [Internet]; 2021. Available from: https://www.who.int/news-room/fact-sheets/detail/tobacco
2. UNDP. Sustainable Development Goals [Internet]; 2015. Available from: https://www.undp.org/sustainable-

development-goals
3. WHO. WHO Global Report on Trends in Prevalence of Tobacco Use 2000-2025 Third Edition [Internet]; 2019. Available from: http://apps.who.int/bookorders.
4. Ministry of Health of Indonesia. Hasil Riset Kesehatan Dasar 2013 [The Results of The 2013 Basic Health Survey] [Internet]; 2013. Available from: https://pusdatin.kemkes.go.id/resources/download/general/Hasil%20Riskesdas%202013.pdf
5. Ministry of Health of Indonesia. Laporan Nasional Riset Kesehatan Dasar 2018 [The National Report of The 2018 Basic Health Survey] [Internet]. 2018. Available from: http://repository.bkpk.kemkes.go.id/3514/1/Laporan%20Riskesdas%202018%20Nasional.pdf
6. The President of The Republic of Indonesia. Peraturan Presiden Republik Indonesia No. 18 Tahun 2020 tentang Rencana Pembangunan Jangka Menengah Nasional 2020-2024 [President of The Republic of Indonesia Regulation No. 18 Year 2020 regarding the 2020-2024 National Medium-Term Development Plan] [Internet]. 2020. Available from: https://peraturan.bpk.go.id/Home/Details/131386/perpres-no-18-tahun-2020
7. Okoli CTC, Kodet J. A systematic review of secondhand tobacco smoke exposure and smoking behaviors: Smoking status, susceptibility, initiation, dependence, and cessation. *Addictive Behaviors*. 2015;47:22-32.
8. Yang X, Yan Z, Xu G, Tan Y, Zhu J. How secondhand smoke exposure affects tobacco use and smoking susceptibility of adolescents: Sex and school differences. *Tob Induc Dis*. 2021;19:68.
9. Wang MP, Ho SY, Lo WS, Lam TH. Smoking family, secondhand smoke exposure at home, and nicotine addiction among adolescent smokers. *Addictive Behaviors*. 2012;37(6):743-746.
10. Azagba S, Baskerville NB, Minaker L. A comparison of adolescent smoking initiation measures on predicting future smoking behavior. *Prev Med Rep*. 2015;2:174-177.
11. Taheri E, Ghorbani A, Salehi M, Sadeghnia HR. Cigarette smoking behavior and the related factors among the students of mashhad university of medical sciences in Iran. *Iran Red Crescent Med J*. 2015;17(1):1-6.
12. Putri NK, Rachmayanti RD. Smoking as a health problem: A priority- setting study in a tobacco industry dependent village. *Public Health and Preventive Medicine Archive (PHPMA)*. 2019;7(2):135-139.
13. Hirpa S, Fogarty AW, Addissie A, Bauld L, Frese T, Unverzagt S, et al. Prevalence and risk factors for tobacco, khat, and alcohol consumption among high school students in Ethiopia. *BMC Public Health*. 2023;23(1).
14. CDC. Datasets for South-East Asian (SEAR) Region, Indonesia, Indonesia - National. GTSS Data Home [Internet]; 2019. Available from: https://nccd.cdc.gov/GTSSDataSurveyResources/Ancillary/DataReports.aspx?CAID=2
15. WHO SEARO. Global Youth Tobacco Survey (GYTS) 2019 Indonesia Fact Sheet [Internet]; 2020. Available from: https://www.who.int/docs/default-source/searo/indonesia/indonesia-gyts-2019-factsheet-(ages-13-15)-(final)-indonesian-final.pdf?sfvrsn=b99e597b_2
16. Zahrani CI, Arcana IM. Determinant of Adolescent Behavior for Smoking Every Day in Indonesia. In: *Seminar Nasional Official Statistics 2019: Pengembangan Official Statistics dalam Mendukung Implementasi SDGs [National Seminar of 2019 Official Statistics: Development of Official Statistics in Supporting the Implementation of SDGs]*; 2019.
17. Oyewole BK, Animasahun VJ, Chapman HJ. Tobacco use in Nigerian youth: A Systematic review. *PLoS One*. 2018;13(5): e0196362.
18. Tun NA, Chittin T, Agarwal N, New ML, Thaung Y, Phyo PP. Tobacco Use among Young Adolescents in Myanmar : Findings from Global Youth Tobacco Survey. *Indian Journal of Public Health*. 2017;61(Suppl 1):S54-S59.
19. Brady SS, Morrell HER, Song AV, Halpern-Felsher BL. Longitudinal study of adolescents' attempts to promote and deter friends' smoking behavior. *Journal of Adolescent Health*. 2013;53(6):772-777.
20. Urrutia-Pereira M, Oliano VJ, Aranda CS, Mallol J, Solé D. Prevalência e fatores associados ao tabagismo entre adolescentes. *J Pediatr (Rio J)*. 2017;93(3):230-237.
21. Setiawan NW. Hubungan Kepercayaan Diri dengan Perilaku Merokok pada Remaja [The Association between Self Confidence with Smoking Behavior among Teenagers] [Internet]; 2021. Available from: http://repository.untag-sby.ac.id/8533/8/JURNAL.pdf
22. Komasari D, Fadilla Helmi A. Faktor Penyebab Perilaku Merokok pada Remaja [Factors associated with smoking behavior among teenagers]. *Jurnal Psikologi*. 2000;(1):37-47.
23. Jamal H, Abdullah AZ, Abdullah MT. Determinan Sosial Perilaku Merokok Pelajar di Indonesia: Analisis Data Global Youth Tobacco Survey Tahun 2014 [The social determinants of smoking among students in Indonesia: Analysis of the 2014 Global Youth Tobacco Survey Data]. *Jurnal Kesehatan Vokasional*. 2020;5(3):141.
24. Brigham CJ. *Social Psychology*. Harper Collins Publisher; 1991.

25. Indra S, Edison, Lestari Y. Faktor Penentu Perilaku Merokok Murid Laki-laki Sekolah Menengah Atas di Kota Pariaman [Determinants of smoking among high school male students in Pariaman City]. *Berita Kedokteran Masyarakat*. 2019;35(1):11-16.
26. Notoatmodjo S. Ilmu Perilaku Kesehatan [The Theories of Health Behavior]. Rineka Cipta; 2014.
27. Theodorus. Ciri Perokok di Kalangan Mahasiswa/i Universitas Sriwijaya [The characteristics of smokers among bachelor students in Sriwijaya University]. *Jurnal JEN*. 1994;3:19-24.
28. Su X, Li L, M.Griffiths S, Gao Y, Lau JTF, K.H.Mo P. Smoking Behaviors and Intentions among Adolescents in Rural China: The Application of the Theory of Planned Behavior and the Role of Social Influence. *Addictive Behaviors*. 2015;48:44-51.
29. Rani M, Thamarangsi T, Agarwal N. Youth Tobacco Use in South - East Asia : Implications for Tobacco Epidemic and Options for Its Control in the Region. *Indian J Public Health*. 2017:12-18.
30. Naik R, Kaneda T. Non Communicable Diseases in Africa: Youth Are Key to Curbing the Epidemic and Achieving Sustainable Development [Internet]; 2015. Available from: https://www.prb.org/wp-content/uploads/2015/04/ncds-africa-policybrief.pdf
31. CDC. Youth and Tobacco Use. 2022. Accessed April 7, 2023. Available from: https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm.
32. Rani M, Thamarangsi T, Agarwal N. Youth tobacco use in South-East Asia: Implications for tobacco epidemic and options for its control in the region. *Indian J Public Health*. 2017;61:S12-S17.
33. Mboi N, Syailendrawati R, Ostroff SM, Elyazar IRF, Glenn SD, Rachmawati T, et al. The state of health in Indonesia's provinces, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Glob Health*. 2022;10(11):e1632-e1645.
34. Raihan K, Azmawati M. Cigarette Smoking and Cardiovascular Risk Factor Among Male Youth Population. *Malaysian Journal of Public Health Medicine*. 2013;13:28-36.
35. Tun NA, Chittin T, Agarwal N, New ML, Thaung Y, Phyo PP. Tobacco use among young adolescents in Myanmar: Findings from global youth tobacco survey. *Indian J Public Health*. 2017;61:S54-S59.