American Journal of Clinical Medicine Research, 2016, Vol. 4, No. 3, 52-55
Available online at http://pubs.sciepub.com/ajcmr/4/3/4

DOI:10.12691/ajcmr-4-3-4

Personal and Environmental Risk Factors of Smoking in Male Adolescent

Muhammad Akbar Tirtosudiro*, Meita Dhamayanti, Dedi Rachmadi Sambas

Department of Child Health, Faculty of Medicine, Universitas Padjadjaran, Hasan Sadikin General Hospital, West Java, Indonesia
*Corresponding author: muhakbart@gmail.com

Abstract Smoking remains a major health problem globally. Smoke uptake usually starts from adolescence age, few among them stops when they reach adulthood. From that pattern, smoking-related death may be increased twice every decade. Early age smokers may experience diseases in later life when they reach adulthood, and they are also at risk of diseases earlier at young age. Physical activity has been found to be one of the risk factor of smoking in adolescent. The objective of this research was to determine the personal and envrionmental risk factors of smoking in male adolescents, including physical activity. This analytical case-control study was performed from May to June 2016 in several senior high schools in Bandung, Indonesia. There were 208 adolescent male subjects, aged 15-19 years, included in the study and were instructed to fill a smoking questionnaire. One hudred and fourty four subjects were chosen with simple random sampling, divided into smoker and non-smoker group, and were given physical activity questionnaire. Two phases of statistical analysis were done. First, bivariate analysis were done for all subjects characteristics by chi-square test, all characteristics with p< 0.25 were then analyzed by multiple logistic regression. P values of <0.05 were considered to be statistically significant. Multiple logistic regression analysis showed that low and moderate level of physical activity (OR 9.98 (CI 95%: 2.25-44.32) and 2.65 (CI 95%: 1.02-6.91), respectively), positive perception of smoking effect on mind {OR 8.76 (CI: 3.41-22.46)}, and smoking close friends dominance (OR 2.50 (CI 95%: 1.15-5.43)) increased the risk of smoking. This research showed that low and moderate physical activity, positive perception of smoking, and exposure to smoking close friends increase the risk of smoking in male adolescent.

Keywords: *adolescent, male, smoking, risk factors, physical activity*

Cite This Article: Muhammad Akbar Tirtosudiro, Meita Dhamayanti, and Dedi Rachmadi Sambas, "Personal and Environmental Risk Factors of Smoking in Male Adolescent." *American Journal of Clinical Medicine Research*, vol. 4, no. 3 (2016): 52-55. doi: 10.12691/ajcmr-4-3-4.

1. Introduction

Young smoker remains a major public health problem. Globally, the average of adolescent smoker was as much as 50% in male and 10% in female, only few among them would stop when they reach adulthood. [1] There were 100 million smoking-related deaths in 20th century, most of them in developing countries. [2] Indonesia, the 5th largest tobbaco producing country, have increasing trend of young smoker prevalence; 34.2% in 2007, 34.7% in 2010, and 36.3% in 2013. [3] If this pattern continoues, smoking can kill around 1 billion lives at the end of this century, most of them in low and middle income countries [2].

Adolescent smokers may experience diseases in later life when they reach adulthood, but smoking may also cause diseases earlier at young age. Recent study showed that smoking may cause narrowing of major blood vessels as early as the first years of starting the behavior. Smoking may also cause reduced lung function and impaired lung growth during adolescence. Smoking have also proved to be involved in causing cancer later in life [4].

Smoking adolescents have 2-13 times higher risk of starting other health-risk behaviors. [5] Knowing the risk factors of smoking early is very important in preventing it. Several personal and environmental risk factors have been associated with smoking in adolescence [6,7,8,9]. Personal risk factors include knowledge and attitude toward smoking. [6] Environmental risk factors include parents, friends, and society. [7,8] One of the personal risk factors include low physical activity. [10] Physical activity will decline in adolescent age, followed by sedentary behaviors. [11,12] A study showed that there were difference of smoking risk factors influence between racial/ethnic in adolescents. [13] There were no previous study that analyze physical activity with other personal and environmental risk factors of smoking with multiple regression method, therefore, this study will analyze personal and environmental risk factors of smoking in Indonesian adolescent, including physical activity.

2. Methods

This case control study was performed from May until June 2016 in several middle class high schools in the second most populated district in Bandung, Indonesia. Subjects were adolescent, aged 15-19 years, divided into two groups: smokers and non-smokers. The smokers were

defined as those who had smoked roll of tobaco for the past 30 days. Subjects who had disability that affects physical activity, chronic illness such as diabetes mellitus, heart, liver, and kidney dysfunction were excluded. Body weight and height were measured and the BMI was calculated as weight/height^2 (kg/m^2). Sample size was estimated to be 72 subjects for each group, calculated by Power Analyzis Sample Size (PASS) software ver. 14 with α=0.05, β=0.2, power=0.8, and effect size of 0.2. The proportion (p_1) of low level of physical activity were 0.524. [14] After obtaining the approval of the Ethics Committee Faculty of Medicine, Universitas Padjadjaran Bandung, Indonesia. Consent for participating in the study were signed by subjects and parents. Subjects will be given smoking questionnaire to be filled. The smoking questionnare consist of subject's smoking status, attitude toward smoking, perception of smoking on appearance and mind, perception of smoking as health-risk behaviour. The questionnare also consist of parental smoking status, close friends smoking status, and parent, close friends, and society permisiveness on subject's smoking status.

Simple random sampling was performed to obtain 72 smokers and non-smokers for subjects that finished smoking questionnaire. They were then interviewed to determine their physical activity. Main physical activity outcomes were high, moderate, and low level of physical activity. Criterias of physical activity were based upon the International Physical Activity Questionnare, by obtaining information of every activity during the last 7 days or usual weekly activities. [14] Two phases of statistical analysis were done. First, bivariate analysis was conducted for all subjects characteristics by chi-square test, all characteristics with p< 0.25 were then analyzed by multiple logistic regression. P values of <0.05 were considered to be statistically significant. The data obtained were evaluated using SPSS for Mac version 23.00 statistical program.

3. Results

There were 208 subjects who completed smoking questionnare included in the study, which consisted of 111 non-smokers and 97 smokers. There were no study subject that fit into exclusion criteria. Seventy two smokers and non-smokers were then chosen by simple random sampling to be analyzed. Mean age and body mass index of the subjects were similar in both smoker and non-smoker group, as shown in Table 1.

Table 1. General characteristics of study subjects

Variable	Smoking status		p value*
	Smoker (n=72)	Non-smoker (n=72)	
Age (year)			
X (SD)	16.4 (0.85)	16.5 (0.89)	0,676
Median	16.4	16.45	
Range	15.1 – 18.5	15 – 19	
Body Mass Index			
X (SD)	19.92 (3.26)	20.43 (4.30)	0,825
Median	19.1	19.24	
Range	14.52–30.94	14.44 – 36.79	

Note: n: total subjects, SD: standard deviation;*Mann-Whitney test.

Table 2. Bivariate analysis of personal and environmental characteristics of study subjects among smoker and non-smoker

Variable	Smoking status		p value
	Smoker n (%)	Non-smoker n (%)	
Personal			
Attitude toward smoking			
Positive attitude toward smoking	50 (69.4%)	49 (68.1%)	0.857*
Negative attitude toward smoking	22 (30.6%)	23 (31.9%)	
Positive perception of smoking effect on appearance			
Agree	6 (8.3%)	1 (1.4%)	0.053*
Don't agree	66 (91.7%)	71 (98.6%)	
Positive perception of smoking effect on mind			
Agree	34 (47.2%)	8 (11.1%)	<0.001*
Don't agree	38 (52.8%)	64 (88.9%)	
Perception of smoking as health-risk behavior			
Agree	69 (95.8%)	71 (98.6%)	0.31*
Don't agree	3 (4.2%)	1 (1.4%)	
Level of physical activity			
Low	10 (13.9%)	4 (5.6%)	0.016**
Moderate	51 (70.8%)	47 (65.3%)	
High	11 (15.3%)	21 (29.2%)	
Environmental			
Parental smoking status			
Yes	50 (70.4%)	49 (68.1%)	0.759*
No	21 (29.6%)	23 (31.9%)	
Close friends smoking status			
Not dominant	25 (34.7%)	46 (63.9%)	<0.001*
Dominant	47 (65.3%)	26 (36.1%)	
Permissive parents attitude toward subject smoking status			
Yes	13 (18.1%)	5 (6.9%)	0.031*
No	59 (81.9%)	67 (93.1%)	
Permissive close friends attitude toward subject smoking status			
Yes	37 (51.4%)	25 (34.7%)	0.022*
No	35 (48.6%)	47 (65.3%)	
Permissive society attitude toward subject smoking status			
Yes	44 (61.1%)	33 (45.8%)	0.066*
No	28 (38.9%)	39 (54.2%)	

Note:* Chi-Square analysis (x^2); **Chi-Square trend analysis (x^2_{trend}).

Table 3. Analysis of factors that associated with smoking by multiple logistic regression

Variable	p value	OR (CI 95%)
Level of physical activity:*		
Low level	0.002	9.98 (2.25–44.32)
Moderate level	0.045	2.65 (1.02–6.91)
Positive perception of smoking effect on mind	<0.001	8.76 (3.41–22.46)
Smoking close friends dominance	0.020	2.50 (1.15–5.43)

Note: OR: odds ratio, CI: confidence interval; *High level as reference.

Three different characteristics of subject; personal, environmental, and physical activity-related; among smoker and non-smoker were presented in Table 2.

The study analyzed the factors from Table 1 and Table 2 with p<0.025 by multiple logistic regression with backward elimination method, presented in Table 3.

First model analyzed 8 factors that influence male adolescent to smoke. On the last model, 4 factors remained significantly associated with smoking, which were low and moderate level of physical activity, positive perception of smoking effect on mind, and smoking close friends dominance.

4. Discussion

This case-control study analyzed risk factors of smoking which involved detailed physical activity with multiple logistic regression analysis of Indonesian male adolescent. The study showed association between level of physical of activity, positive perception of smoking effect on mind, smoking close friends dominance and smoking in male adolescents.

This study showed that low level of physical activity showed to increase the risk of smoking as much as 10 times compared to those with high level of physical activity. Adolescents with moderate level of physical activity had 2.7 times increased risk of smoking compared to those with high level of physical activity. These findings were also found in a study in Cyprus that found a consistent and negative relationship between physical activity and smoking in Cyprus adolescent and young adults, but they did not consider other risk factors that affects smoking behaviour. [10] A prospective study in Finland showed that persistent physical inactivity in adolescence relates to adult smoking. [15] Several mechanism that may play role in how level of physical activity correlates with smoking in adolescent. First, subjects that were physically active will have a goal to increase and maintain their fitness and health, and smoking will interfere with the goal that they have. Moreover, adolescent that have interest in active lifestyle will have friends with the same interest. [15]

Current study found positive perception of smoking effect on mind increases the risk of smoking 8.8 times. A study in China showed that, adolescent that think smoking has positive effect on mind and pleasurable tend to be a smoker, although when they analyze it by logistic regression with other personal and environmental factors, it had a small effect on smoking, as much as 1.5 times increased risk of smoking. [6] This shows that race/ethnics may have a part in determining risk factors of smoking in adolescent. Other possibilities may be due to difference in number of variable and the study did not include physical activity as one of the personal risk factors.

Smoking close friends dominance also found to increase the risk of smoking by 2 times in our current study. A study in Palu, Indonesia showed that friends smoking status associated with 8 times increased risk of smoking in adolescent. [7] This value is much higher than our study, but the study did not considered other risk factors of smoking in adolescent. A study in China showed that smoking close friends had significant association with smoking in bivariate analysis, but multivariate logistic regression with other environmental and personal factors showed no significant association between them. [6] Race/ethnic may have a role in this difference with our study.

Our current study showed permissive environment, positive perception of smoking on appearance had no significant relationship with smoking. These findings were different with previous studies. A study in Yogyakarta, Indonesia found that permissive environment had a significant association with smoking after analyzed with logistic regression. [8] However, they only consider four factors; permissive parents, smoking close friends, phsychological satisfaction of smoking, and smoking status. A study with multiple regression in China showed positive perception of smoking on appearance increases risk of adolescent smoking. [6] However, they did not consider physical activity as one of the risk factors of smoking.

Global Reccomendations on Physical Activity for Health by WHO is one of the reccomendations that can be referred for reccomendation on adolescent physical activity. [16] Our current study results support the reccomendation and encourage adolescents to increase their physical activity, and to avoid physical inactivity. This study also encourage education about misperception of positive effect of smoking to adolescents. Significant finding of association between smoking close friends dominance with adolescent smoking encourages adolescent to be more selective in choosing friends. Increasing physical activity will also help to solve this problem, adolescent with high physical activity would find close friends with similar interest [15].

This study have several limitation, this study did not differentiate the types and severity of the smoker. By considering the type and severity of smoker, role of each risk factors may become more visible. Another limitation is that this study is a subjective questionnare-based study. However, we already standardized and trained our questionnaire interviewer.

5. Conclusion

Low and moderate physical activity, positive perception of smoking, and exposure to smoking close friends increase the risk of smoking in male adolescent.

Acknowledgements

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. For their assistance in the initial manuscript preparation counseling of this work the authors thank Professor Abdurachman Sukadi and Professor Herry Garna.

References

[1] Jha P, Peto R. Global effects of smoking, of quitting, and of taxing tobaco. N Engl J Med. 2014; 370(1): 60-8.

[2] World Health Organization. WHO report on the global tobacco epidemic. Loxembourg: WHO Press. World Health Organization, 2013.

[3] Global youth tobacco survey (GYTS): Indonesia Report 2014. World Health Organization, 2015.

[4] Preventing tobacco use among youth and young adults: a report of The Surgeon General. Center for Disease Control and Prevention, 2012.

[5] Division of the Vermont Departement of Health. Adolescent smoking: an indicator for other risky behaviors. Vermont.1996. p. 1-2.

[6] Xu X, Leung DYP, Li B, Wang P, Zhao Y. Smoking-related knowledge, attitude, social pressure, and environmental constraints among new undergraduates in Chongqing, China. Int J Environ Res. 2015; 12. (895-909).

[7] Syarif SSHM, Bungawati A. Faktor-faktor yang berhubungan dengan kebiasaan merokok siswa SMK Negeri 1 Tojo Barat Kabupaten Tojo Una-Una. Promotif. 2012; 1(2): 113-21.

[8] Komalasari D, Helmi AF. Faktor-faktor penyebab perilaku merokok pada remaja.

[9] Multani S, Reddy JJ, Bhat N, Sharma A. Assessment of knowledge, attitude, behaviour and interpersonal factors related to the use of tobacco among youth of Udaipur City, Rajasthan, India: A Cross-Sectional Study. Addict Health. 2012; 4(3-4): 142-50.

[10] Charilaou M, Karekla M, Constatinou M, Price S. Relationship between physical activity and type of smoking behavior among adolescents and young adults in Cyprus. Nicotine & Tobacco Research. 2009: 1-8.

[11] Allison KR, Adlaf EM, Dwyer JJ, Lysy DC, Irving HM. The decline in physical activity among adolescent students. Canadian Journal of Public Health. 2007;98(2): 97-100.

[12] Brodersen NH, Steptoe A, Boniface DR, Wardle J. Trends in physical activity and sedentary behaviour in adolescence: ethnic and socioeconomic differences. Br J Sports Med. 2007;41:140-4.

[13] Mays D, Luta G, Walker LR, Tercyak KP. Exposure to peers who smoke moderates the association between sports participation and cigarette smoking behavior among non-white adolescents. Addict Behav. 2012; 37(10): 1114-21.

[14] Papathanasiou G, Papandreou M, Galanos A, Kortianou E, Tsepis E, Kalfakakou V, et al. Smoking and physical activity interrelations in health science students. is smoking associated with physical inactivity in young adults? Hellenic J Cardiol. 2012; 53: 17-25.

[15] Kujala UM, Kaprio J, Rose RJ. Physical activity in adolescence and smoking in young adulthood: a prospective twin cohort study. Addiction. 2007; 102: 1151-7.

[16] WHO. Global reccomendations on physical activity for health. Switzerland: WHO Press; 2010.