

# Personal and Environmental Risk Factors of Smoking in Male Adolescent

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**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 environmental 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 hundred and forty 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

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## 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 20<sup>th</sup> century, most of them in developing countries. [2] Indonesia, the 5<sup>th</sup> largest tobacco 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 continues, 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