Effect of Knowledge, Peer Group, Family, Cigarette Price, Stipend, Access to Cigarette, and Attitude, on Smoking Behavior

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ABSTRACT

Background: Passive smokers inhale 75% of ambient smoke and 50% of exhaled smoke. A cigarette contains 4,000 poisonous chemical agents, at least 69 of which are carcinogenic. Therefore ambient tobacco smoke is detrimental to health. The purpose of this study was to analyze the effect of knowledge, peer group, family, cigarette price, stipend, access to cigarette, and attitude, on smoking behavior.

Subjects and Method: This was an analytic and observational study with cross sectional design. This study was conducted at School of Health Polytechnics, Surakarta, Central Java. A total of 105 male students was selected for this study. The dependent variable smoking status. The independent variables knowledge, peer group, family, cigarette price, stipend, access to cigarette, and attitude. The data were collected by a set of questionnaire, and were analyze by logistic regression model.

Results: High smoking peer group (OR= 3.21; 95% CI=1.18-8.72; p= 0.022), high stipend (OR= 3.66; 95% CI= 1.28-10.49; p= 0.016), convenient access to cigarette (OR= 3.02; 95% CI= 1.04 to 8.73; p= 0.042) increased the likelihood of smoking. High knowledge about tobacco smoking (OR= 0.35; 95% CI=0.13-0.95; p = 0.039) and non-smoking family (OR= 0.16; 95% CI=0.03 to 0.70; p= 0.015) decreased the likelihood of smoking. High price of cigarette (OR= 0.86; 95% CI= 0.23 to 3.19; p= 0.819) and positive attitude (OR= 0.88; 95% CI= 0.33 to 2.36; p= 0.795) did not show statistically significant effect on smoking.

Conclusion: Smoking peer group, stipend, access to cigarette increase the probability of smoking. Knowledge about tobacco smoking and non-smoking family decrease the probability of smoking.

Keywords: knowledge, peer group, family, cigarette price, stipend, access to cigarette, attitude, smoking behavior

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BACKGROUND

The widespread impacts of using tobacco products on public health in the world have raised great concern from the international community. The World Health Organization (WHO) arranges an instrument to do tobacco control effectively, precisely and comprehensively. It is known as Framework Convention on Tobacco Control (FCTC). The same concern also emerges in public discourse in the country.

Groups of Civil Society Organization (CSO) in the Indonesian NGO Coalition for Tobacco Control states that the Indonesian Government must do immediate and strategic actions on the situation named "National Emergency Threats of Tobacco Consumption in Indonesia" because the smokers in Indonesia have consumed cigarette by no less than 360 billion cigarettes per year (Mulyana, 2014).

Cigarettes that have been consumed produce cigarette smoke which is very dangerous for the smoker health as active smokers, as well as passive smokers. Basically, cigarette smoke consists of the main
fumes which contain 25% dangerous levels
and side fumes which contain 75%
dangerous levels. Passive smokers inhale
75% of hazardous ingredients and half of
the smoke exhaled. A cigarette contains
4000 toxic chemicals and no less than 69 of
them are carcinogenic. Therefore, cigarettes
and environment which contaminate with
cigarette smoke could endanger health.
These chemical contents cause various non-
communicable diseases such as heart
disease and vascular disorders, strokes,
lung cancer, and oral cancer. In addition,
cigarettes cause fertility decline, slow fetal
growth both physically and IQ, infant
immunity disorders, and increase number
of mortality (Aditama, 2006).

There are around 34.7% of Indo-
nesia's population aged 10 years and over
are smokers. Nationally, the prevalence of
smokers in 2010 was 34.7%; the highest
number was in Central Kalimantan Pro-
vince (43.2%) and the lowest number was
in Southeast Sulawesi (28.3%). The preva-
ience of smokers aged 10-14 in 1995 was
0.3% or around 71.000 people. In addition,
in 2010, it increased sharply by 426.000
people. In other words, in 15 years, the
number of smokers in this age group
increase sixfold. There are more than 40.3
million children living with smokers and
exposed to cigarette smoke; They are at risk
of experiencing bronchitis, pneumonia,
middle ear infections, asthma, and lung
growth delays; it also caused poor health in
adulthood (MOH, 2010).

The current smoking behavior can
cause death to 500 million people with
more than half of them were children and
adolescents; it occurs due to the high
number of tobacco consumption. Beginner
smokers in Indonesia are getting younger.
Various studies have shown that adoles-
cents aged 11-18 years have smoked
already. The risk of smoking will lead to
negative effects on health, especially for
adolescents who have a potential to become
prospective family-builders and the next
generation nation. In addition, the data of
WHO state that 30% smokers in the world
are adolescents (Mubarok, 2009).

Adolescents are more commonly
known as stage of adolescence which has a
broad meaning. In this case, maturity in
mental, emotional, spatial, and physical
greatly affect the development. In this stage
of adolescence, they spread their wings with
various dreams. Basically, they have great
curiosity, so they tend to be easily influ-
enced by daily habits and the influence of
the environment around them. Environ-
mental factors have a very important role
for adolescents development. Generally, the
adolescents choose to socialize based on the
characteristics of adolescent friendship.
The characteristics of adolescent friendship
are influenced by the similarity of age,
gender, and race. The similarity in con-
suming drugs, cigarettes and liquor greatly
affect in selecting friends (Permatasari and
Wahyuni, 2011).

The problem formulation in this study
is: "Is there any effect of knowledge about
smoking, peer group, family, cigarette
price, stipend, access to cigarettes, and at-
titude about the dangers of smoking on
smoking behavior in students at School of
Health Polytechnics, Surakarta?"

This study aimed to know the
effect of knowledge, peer group, family, cigarette
price, stipend, access to cigarettes, and at-
titude about the dangers of smoking, on
smoking behavior in students at School of
Health Polytechnics, Surakarta.

SUBJECTS AND METHOD
This study was an analytic and observa-
tional study with cross sectional design.
The population of this study was 105 male
students at School of Health Polytechnics,
Surakarta. This study used simple random sampling technique. The independent variables were knowledge, peer group, family, cigarette price, stipend, access to cigarette, and attitude. The dependent variable was smoking status. This study used logistic regression model to analyze the data.

RESULTS

1. Univariate Analysis
The result of the characteristic of subject of the study in table 1 shows that most of students had good knowledge about smoking (50.5%), high peer group influence was high (63.8%), the family influence was high (79.0%), the cigarette price was cheap (84.8%), most of the students had the support of stipend to buy cigarette (69.5%), the access to get cigarette was easy (69.5%), and most of students had positive attitude about the dangers of smoking (52.4%).

Table 1. The characteristic of sample

| Knowledge          | n  | %  |
|--------------------|----|----|
| Poor               | 52 | 49.5 |
| Good               | 53 | 50.5 |
| Peer Group Influence |   |    |
| Low                | 38 | 36.2 |
| High               | 67 | 63.8 |
| Family Influence   |   |    |
| Low                | 22 | 21.0 |
| High               | 83 | 79.0 |
| Cigarette Price    |   |    |
| Expensive          | 16 | 15.2 |
| Cheap              | 89 | 84.8 |
| Stipend            |   |    |
| Without support    | 32 | 30.5 |
| Support            | 73 | 69.5 |
| Access to cigarette|   |    |
| Difficult          | 32 | 30.5 |
| Easy               | 73 | 69.5 |
| Attitude           |   |    |
| Negative           | 50 | 47.6 |
| Positive           | 55 | 52.4 |

Table 2 shows that there was an effect of knowledge about smoking on smoking behavior which statistically significant (OR= 0.37; p= 0.018). Students with poor knowledge about smoking had 0.37 times greater possibility of smoking than students with good knowledge.

2. Bivariate Analysis

Table 2. The chi square test of knowledge on smoking behavior

| Knowledge | Smoking Behavior | OR  | p    |
|-----------|------------------|-----|------|
| Low       | No               | 13  | 39   |
|           | Yes              |     |      |
| High      | No               | 25  | 28   |
|           | Yes              |     |      |
| Total     | No               | 38  | 67   |
|           | Yes              |     |      |

Table 3 shows that there was an effect of peer group on smoking behavior which was statistically significant (OR= 4.38; p< 0.001).

Table 3. The Chi Square Test of Peer Group on Behavior

| Peer Group | Smoking Behavior | OR  | p    |
|------------|------------------|-----|------|
| Low        | No               | 22  | 16   |
|            | Yes              |     | 4.38 |
|            |                  |     | 0.001|
| High       | No               | 16  | 51   |
|            | Yes              |     |      |
| Total      | No               | 38  | 67   |
|            | Yes              |     |      |

Table 4 shows that there was an effect of family on smoking behavior which statistically significant (OR= 0.22; p= 0.013). It showed that the effect of smoking family had 0.22 times greater possibility to make students smoke.

Table 4. The Chi Square Test of Family on Smoking Behavior

| Family influence | Smoking Behavior | OR  | p    |
|------------------|------------------|-----|------|
| Low              | No               | 3   | 19   |
|                  | Yes              |     | 0.22 |
|                  |                  |     | 0.013|
| High             | No               | 35  | 48   |
|                  | Yes              |     |      |
| Total            | No               | 38  | 67   |
|                  | Yes              |     |      |

Table 5 shows that there was no effect of cigarette price on smoking behavior (OR= 1.46; p= 0.494). The cheap cigarettes
had 1.46 times greater possibility to make students smoke compared to the expensive cigarettes.

Table 5. The chi square test of cigarette price on smoking behavior

| Cigarette Price | Smoking Behavior | OR  | p    |
|-----------------|------------------|-----|------|
| Low             | No               | 7   | 9    | 1.46 | 0.494 |
| High            | Yes              | 31  | 58   |
| Total           |                  | 38  | 67   |

Table 6. The Chi Square Test of Stipend on Smoking Behaviour

| Stipend       | Smoking Behavior | OR  | p     |
|---------------|------------------|-----|-------|
| Without       | No               | 18  | 14    | 3.41 | 0.005 |
| Support       | Yes              | 20  | 53    |
| Total         |                  | 38  | 67    |

Table 6 shows that there was an effect of stipend on smoking behavior which statistically significant (OR= 3.41; p= 0.005). The supportive stipend had 3.41 times greater possibility to make students smoke.

3. Multivariate Analysis

Table 7. The chi square test of access to cigarette on smoking behavior

| Access to Cigarette | Smoking Behavior | OR  | p  |
|---------------------|------------------|-----|----|
| Difficult           | No               | 19  | 16 | 3.19 | 0.006 |
| Easy                | Yes              | 19  | 51 |
| Total               |                  | 38  | 67 |

Table 7 shows that there was an effect of access to cigarette on smoking behavior (OR= 3.19; p= 0.006). The easy access to cigarettes had 3.19 times greater possibility to make students smoke compared to the difficult access to cigarettes.

Table 8. The chi square test of attitude about the dangers of smoking on smoking behavior

| Attitude       | Smoking Behavior | OR  | p  |
|----------------|------------------|-----|----|
| Negative       | No               | 16  | 34 | 0.71 | 0.39 |
| Positive       | Yes              | 22  | 33 |
| Total          |                  | 38  | 67 |

Table 8 shows that there was no effect of the attitude about the dangers of smoking on smoking behavior (OR= 0.71; p= 0.394).

Table 9. The multiple logistic regressions

| Independent Variables | OR  | 95% CI             | p    |
|-----------------------|-----|--------------------|------|
| Knowledge (high)      | 0.35| 0.13               | 0.95 | 0.039 |
| Peer influence (high) | 3.21| 1.18               | 8.72 | 0.022 |
| Family influence (high)| 0.16| 0.03               | 0.70 | 0.015 |
| Cigarette price       | 0.86| 0.23               | 3.19 | 0.819 |
| Stipend (support)     | 3.66| 1.28               | 10.46| 0.016 |
| Access to cigarette (easy) | 3.02| 1.04               | 8.73 | 0.042 |
| Attitude              | 0.88| 0.33               | 2.36 | 0.795 |

The Odd Ratio value of knowledge variable about cigarettes was 0.35. Students with poor knowledge about smoking had 0.35 times greater possibility of smoking
than students with good knowledge about smoking. The result of wald test showed that there was an effect of knowledge about smoking on smoking behavior in students which statistically significant (OR= 0.35; 95% CI = 0.13 - 0.95; p = 0.039).

The Odd Ratio value of the effect of peer group variable was 3.21. The high influence of peer group had 3.21 times greater possibility to make students smoke than the low influence of peer group. The result of wald test showed that there was an effect of peer group on smoking behavior in students which statistically significant (OR= 3.21; 95% CI = 1.18-8.72; p = 0.022).

The Odd Ratio value of the effect of family variable was 0.16. The effect of smoking family had 0.16 times greater possibility to make students smoke than the non-smoking family. The result of wald test showed that there was an effect of family on smoking behavior in students which statistically significant (OR= 0.16; 95% CI = 0.03-0.70; p = 0.015).

The Odd Ratio value of cigarette price variable was 0.86. The cheap cigarettes had 0.86 times greater possibility to make students smoke than the expensive cigarettes. The result of wald test showed that there was an effect of cigarette price on smoking behavior in students, but statistically insignificant (OR= 0.86; 95% CI = 0.23-3.19; p = 0.819).

The Odd Ratio value of the effect of stipend variable was 3.66. The supportive stipend had 3.66 times greater possibility to make students smoke than the unsupportive stipend. The result of wald test showed that there was an effect of stipend on smoking behavior in students which statistically significant (OR= 3.66; 95% CI = 1.28-10.49; p = 0.016).

The Odd Ratio value of the effect of access to cigarette variable was 3.02. The easy access to cigarette had 3.02 times greater possibility to make students smoke than the difficult access to cigarette. The result of wald test showed that there was an effect of access to cigarette on smoking behavior in students which statistically significant (OR= 3.02; CI 95%= 1.04-8.73; p = 0.042).

The Odd Ratio value of the effect of attitude about the dangers of smoking variable was 0.88. The negative attitude about the dangers of smoking had 0.88 times greater possibility to make students smoke than the positive attitude about the dangers of smoking. The result of wald test showed that there was an effect of attitude about the dangers of smoking on smoking behavior in students, but statistically insignificant (OR= 0.88; CI 95%=0.33-2.36; p = 0.795).

The Nagelkerke R² value was 38.9%. The variables of knowledge about cigarettes, peers group, family, cigarette price, stipend, access to cigarettes, and attitude about the dangers of smoking could explain smoking behavior by 38.9% and 61.1% were explained by other factors outside of the study model.

**DISCUSSION**

**The effect of knowledge about smoking on smoking behavior**

The result of this study showed that there was an effect of knowledge about smoking on smoking behavior. The result of wald test showed that there was an effect of knowledge about smoking on smoking behavior in students which statistically significant (OR= 0.35; 95% CI= 0.13 to 0.95; p= 0.039). This is in line with the behavioral theory of Green et al, (1980) which stated that behavior can be associated with predisposing factors such as knowledge. According to Azjen and Fishbein (2005) in the behavior theory of Planned of Behavior also stated that knowledge affects indivi-
dual behavior towards something such as smoking behavior in students.

The result of this study supported a study conducted by Maseda et al. (2013) which showed that there is a correlation between knowledge about the dangers of smoking and smoking behavior in adolescent boys. Adolescents generally have high curiosity, because they are pushed by high curiosity.

Adolescent tend to want to explore and try everything they have never experienced. It is also pushed by desire as adults. As a result, they wanted to try to do what adults often do. As a result, the adolescent boys try to smoke clandestinely because they often see adults doing it (Ali and Asrori, 2010).

**The effect of peer group on smoking behavior**
The result of this study showed that there was an effect of peer group on smoking behavior. The result of wald test showed that there was an effect of peer group on smoking behavior in students which statistically significant (OR= 3.21; 95% CI= 1.18-8.72; p= 0.022).

This is in line with the behavioral theory of Green et al., (1980) which stated that the behavior of one of the factors that affects behavior was an reinforcing factor. This factor is obtained from the closest people and from the existence of social support such as friends. The result of this study supported the study conducted by Maseda et al. (2013) which showed that the influence of peer group is the main reason on smoking behavior in students.

According to Hasanah and Sulastrri (2011), there is a significant correlation between peer group and smoking behavior in male students. However, this result is not in line with study conducted by Azizah et al., (2013) which stated that there was no effect of peer group on smoking behavior.

Peer group who smoke will be able to affect other students to smoke, and vice versa. If students associate with other students who do not smoke, it also affects students not to smoke. This is in accordance with the study conducted by Komasari and Helmi (2000) which stated that the peer group environment provides an effective contribution by 33.048%. The peer group environment has a very important meaning for adolescents. The need to be accepted and the effort to avoid rejection of peer groups are very essential requirements. Adolescent do not want to be rejected. They also avoid the term of 'sissy' or 'cowardice'. Smoking for adolescents is also a symbol: a symbol of power, masculinity, and maturity.

**The effect of family on smoking behavior**
The result of this study showed that there was an effect of family on smoking behavior in students which statistically significant (OR= 0.16; CI 95%= 0.03-0.70; p = 0.015). This is in line with the behavioral theory of Green et al., (1980) which stated that the behavior of one of the factors that affect behavior was an reinforcing factor. This factor is obtained from the closest people and from the existence of social support given such as family.

The result of this study supported a study conducted by Geckova et al. (2005) which showed that there are direct and indirect effects of smoking behavior in parents on smoking behavior in students. According to Hasnah and Sulastrri (2010), there is an effect of parents support on smoking behavior in male students. Parents or family are the environmental factors related to smoking behavior.

Parental control is a characteristic that is considered to be significantly associated with some risk behaviors including smoking behavior (Hidayaningsih et al.,...
2011). Family factors play a major role in the formation and appearance of behavior, both positive and negative.

The results of this study supported a study conducted by Theodorus (1994) which stated that the smoking family plays a significant role in the smoking behavior of their children compared to non-smoking family. According to the social cognitive learning theory, smoking is not only the learning process of children's observation of their parents or siblings, but also the positive reinforcements from their parents and the consequences of smoking which are pleasant by adolescent.

**The effect of cigarette price on smoking behavior**

The result of this study showed that there was an effect of cigarette price on smoking behavior in students, but statistically non-significant (OR= 0.86; 95% CI= 0.23 to 3.19; p= 0.819). Consumers’ income will determine the amount of purchasing power they have. Therefore, for normal goods, the increase in consumer income will increase the demand of these goods. In the other hand, for inferior goods, the increase in consumer income will actually decrease demand for these goods. It shows that students basically do not have an ability to buy cigarettes, because they basically have not worked. Therefore, they do not get income and they rely on money given by their parents.

The more expensive cigarettes can not make students smoke. Meanwhile, cheap cigarettes can cause students smoke. According to income groups, the effect of increasing of cigarettes price for the poor was greater than those who were rich. An increase in cigarette price would decrease cigarette consumption by 10%.

**The effect of stipend on smoking behavior**

The result of this study showed that there was an effect of stipend on smoking behavior in students which statistically significant (OR= 3.66; 95% CI= 1.28 to 10.49; p= 0.016).

The result of this study supported a study conducted by Lindawati et al., (2011) showed that the enabling factor variable is stipend which significantly related to the smoking behavior in students. This is in accordance with Mc Donald's opinion (2011) which stated that low family income or poverty make adolescents feel anxious and depressed. The low family incomes (low stipend) are 5 times more difficult to stop consuming tobacco, compared to prosperous families (high stipend).

Oktavia (2010) also mentioned that there is a correlation between smoking behavior and stipend. The adolescents who has excess stipend had 20 times greater possibility of smoking than students who do not have excess stipend.

**The effect of accesss to cigarette on smoking behavior**

The result of this study showed that there was an effect of access to cigarette on smoking behavior in students which statistically significant (OR= 3.02; 95% CI =1.04 to 8.73; p= 0.042).

This is in line with the behavioral theory of Green et al, (1980) which stated that the behavior of one of the factors that affected behavior is an reinforcing factor. This factor is obtained from the closest people and from the existence of social support such as access. Smoking habits occur because of the influence of social environments, peer group, parents, media, and so on. Smoking habits occured due to the influence of social environments, peer group, parents, media, and so on. There are more adolescents who smoke and addict to
smoking every day due to the cigarette publications in a variety of print media and electronic which are getting more intense.

The enabling factor on smoking behavior was the availability of cigarettes sold around the house. In addition, the retail or bars cigarette sales increased children's and adolescents' access to cigarettes. The sales of bar cigarettes were commonly occured, even though it was sold at a low price. It made the easier access, especially for the sale of cigarettes. As a result, students obtained cigarettes easily.

**The effect of attitude about the dangers of smoking on smoking behavior**

The result of this study showed that there was an effect of attitude about the dangers of smoking on smoking behavior in students, but statistically significant (OR= 0.88; 95% CI =0.33-2.36; p = 0.795).

The result of this study supported a study conducted by Ariani (2011) which showed that there is no correlation between attitude and smoking behavior in students.

Based on the statement above, it is concluded that there was no correlation between attitudes towards health on smoking behavior. It may be caused by someone desire of smoking which was not only affected by attitudes towards health, but many factors influenced smoking behavior such as the belief in the consequences of smoking behavior. A person's decision to smoke or not was not entirely affected by the belief in the consequences of smoking behavior, but also by many factors. For example, an adolescent have a positive attitude towards smoking, but without being supported by beliefs about the negative consequences of smoking, the positive attitude towards health will not affect smoking behavior.

The limitation in this study is the sample of study which was only conducted in students at School of Health Polytechnics, Surakarta. The result of this study could not be generalized in other places or locations. In addition, the data in this study did not use in-depth interviews with students because it used a set of questionnaire.

This study concludes that there is an effect of knowledge about smoking on smoking behavior in students which statistically significant (OR= 0.35; 95% CI= 0.13 to 0.95; p = 0.039).

There is an effect of peer group on smoking behavior in students which statistically significant (OR= 3.21; 95% CI = 1.18 - 8.72; p = 0.022).

There is an effect of family on smoking behavior in students which statistically significant (OR= 0.16; 95% CI = 0.03-0.70; p = 0.015).

There is an effect of cigarette price on smoking behavior in students, but statistically insignificant (OR= 0.86; 95% CI = 0.23-3.19; p = 0.819).

There is an effect of stipend on smoking behavior in students which statistically significant (OR= 3.66; 95% CI = 1.28-10.49; p = 0.016).

There is an effect of access to cigarette on smoking behavior in students which statistically significant (OR= 3.02; 95% CI = 1.04-8.73; p = 0.042).

There is an effect of attitude about the dangers of smoking on smoking behavior in students, but statistically insignificant (OR= 0.88; 95% CI = 0.33-2.36; p = 0.795).

The implication in this study shows that there is an effect of knowledge about smoking, peer group, family, stipend, and access to cigarettes on smoking behavior in students. It states that the planned behavior theory about behavior change is truly proven and can be used by health practitioners in providing health promotions about minimizing smoking behavior by
combining these factors. Therefore, the goals are achieved as expected.

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