EFFECT OF ENVIRONMENTAL FACTORS FOR NOT SMOKING in HIGH SCHOOL STUDENTS (SURVIVAL ANALYSIS)

PENGARUH FAKTOR LINGKUNGAN UNTUK TIDAK MEROKOK SISWA SMA (ANALISIS SURVIVAL)

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ABSTRACT

Smoking behavior in adolescents is caused by one of the environmental factors (external) including family or parents, siblings or peers who smoke and advertise cigarettes in the mass media.[1,2] The prevalence of active smokers for boys aged 10-14 years was 3.7% in 2013 or increased 12 times compared to 1995.[3] The purpose of this study is to look at the effect of the environment on students' resistance to not smoking. This study used quantitative research with *cross sectional study* design. Held in public high schools in the city of Padang.Method *Multistage random sampling* for selecting high schools (5 selected high schools), the sample size used the formula *survival study,* with 220 students.[4] Data were collected using a valid and reliable questionnaire, the data were processed, and analyzed by survival analysis.[4,5] The results of the study show that the proportion of adolescent endurance to not smoking until the age of 19 is 41%, the youngest age to ever smoke is 7 years and the oldest age is 19 years, Parental behavior is a factor that is highly correlated with adolescent endurance not to smoke. It is recommended that relevant officials conduct health education in accordance with the phases of development of children and adolescents. Conduct health education in an informal environment and break the chain of distribution of cigarettes.

Keywords: Cigarettes, mass media, peers, parents, middle school students

BACKGROUND

Smoking behavior is a bad habit that occurs in society. Many studies have shown that smoking increases the risk of various diseases, such as heart and blood vessel disorders, lung cancer, oral cancer, laryngeal cancer, esophageal cancer, bronchitis, high blood pressure, impotence, and pregnancy disorders and fetal defects.[2,9]

Smoking can also cause death. Based on the research results of the Agency Ministry of Health Research in 2010 showed that deaths from tobacco related diseases occurred about 12.7% of all deaths in the same year.[6] The fact is the prevalence of active smokers of adolescent boys aged 10-14 years was 3.7% in 2013 or increased 12 times compared to 1995 which was 0.3%, while adolescents aged 15-19 years 37.3% in 2013. Age of smoking began to get younger, where children aged 5-9 years had started smoking and the increase highest prevalence at age 5- 9 years have started smoking and the increase in prevalence highest at the age of 15-19 years is 13.6%, from 43.3% in 2010 to 56.9% in 2013.[10]

In the province of West Sumatra, based on the 2007 Basic Health Research (Riskesdas) report, it is found that more than half of the male population aged 10 years and over are daily smokers which is equal to 52.4%, the highest percentage of the age of first time smoking in men found in the age group 15-19 years which is equal to 40.9% and 22.7% for women. Whereas in Padang city, the highest percentage of smoking ages is in the age group of 15-19 years which is 46.3%.[6]

Based on these data it can be infered that smoking behavior starts during children and adolescence. There are many reasons under lying this smoking behavior in adolescents. In general, smoking behavior is a function of the environment and the individual, that is, smoking behavior is caused not only by internal factorsl, but also by environmental factors.

Environmental factors that influence adolescents to smoke are those who have a big influence on the process of adolescent socialization. It include factors of parents, peers, and interesting mass media exposure.[1,2]

METHOD

This study use quantitative research with *cross sectional study* design. It was held in public high schools in the city of Padang. The population of state high school students in Padang City is 2150 students. The method *multistage random sampling* was employed for

selecting high schools in the study area (5 selected high schools), the sample size used the formula *survival study, with a total of 220 students* from each selected high school as a sample of 44 students.[11] Data were collected using a questionnaire. To ensure the data to be valid and reliable, the respondents were asked to answer questions honestly. The data were processed and analyzed through some steps which include univariate, bivariate (*log-rank test)*, multivariate (regression method multivariable cox).[4,7,8]

RESULTS AND DISCUSSION

Based on the data that haves been collected from 5 (five) schools selected as a sample in the city of Padang, it is found that the surveyed students who had smoked as many as 130 people from 220 teenagers. To see more clearly the proportion of teenagers who smoke, it can be seen in the graph below:
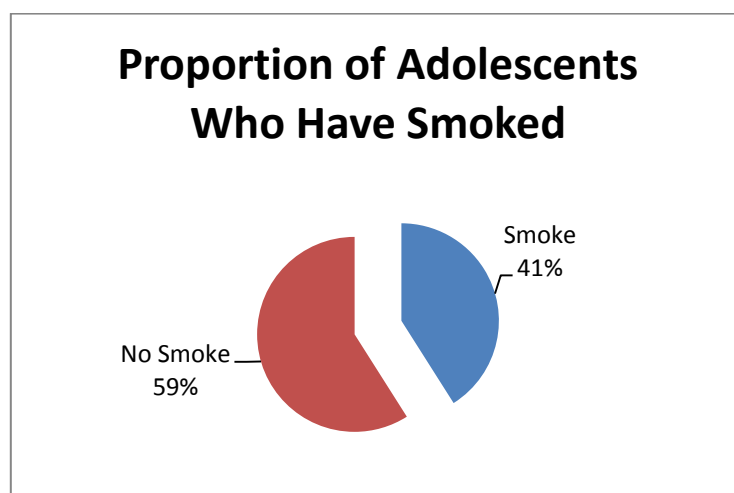

Figure 1. Proportion of adolescents who smoke in 2017

Based on Figure 1 the proportion of adolescents who survive not smoking is by 59%. The proportion of adolescent endurance to not smoke until adolescents who aged 19 years is right at 0.41 (41%), meaning that out of 1000 adolescents there are 410 adolescents who have did not survive not to smoke until the exact age of 19 years. This can be based on the rapid growth and development of adolescents. Self-identity and feelings of dependence on parents have started to stand out in adolescents. Teenagers tend to try new things that they like and they consider "popular" among them. Some teenagers think they are cool if they have smoked.

The average age of first time smoking in adolescents in Padang in 2017 can be seen in table 1.

Table 1: The average age of first time smoking for teenagers in 2017

Range		Mean	SE	95% CI
Min	Max		Mean	
7	19	14.76	0.171	14.43 - 14.43

Based on the table 1, it was found that the average age of teenager start smoking was 14.76 years old with a *Standard Error* mean(SE) of 0.171. The youngest age of a teenager who has ever smoked is 7 years and the highest age of a teenager who has ever smoked is 19 years. This figure shows that the age of teenager began smoking is lower than the Global Youth Tobacco Survey (GYTS) data. The Global Youth Tobacco Survey (GYTS) states that Indonesia is the country with the number of teenage smokers highest in the world and the age of first time trying to smoke in men is 12-13 years old.[10,12] Interestingly, there are smokers who start trying cigarettes the first time at the age of 7 years old, this shows that even earlier teenagers and even children are easily affected by smoking. Smoking activities that are considered as a symbol of valor make teenagers compete to get the predicate.[12] Adolescents who do not have a strong stance will be easily entangled in smoking behaviour, because some adolescents assume that smoking is the only way to be accepted in the group.[13] If adolescents are unable to refuse, when they start to smoke like once or twice eventually, over time smoking will become their habit.

Table 2. Cumulative Probability of Adolescent Resistance to Not Smoking in 2017

No	Time (year)	Smoking Adolescent Number of	Cumulative Smoking Adolescents	Prob. Cumulative Resilience
1	7	4	4	0.982
2	8	2	6	0.973
3	9	2	8	0.964
4	10	6	14	0.936
5	11	10	24	0.891
6	12	11	35	0.841

7	13	33	68	0.691
8	14	23	91	0.586
9	15	32	123	0.441
10	16	6	129	0.414
11	17	1	130	0.409

Based on table 2, the number of adolescents who have smoked until the age of 17 is 130. The median adolescent resistance to not smoking is at the age of 15 years. When viewed from the time of the occurrence of smoking behavior in adolescents, the number of smoking incidents occurs when teenagers are 13 to 15 years old. Based on data Riskesdas in 2007, 2010 and 2013 which showed that the age smokers began smoking in Indonesia was in the age group of 15-19 years, and based on the central data and information of the Ministry of Health of the Republic of Indonesia, it is stated that the smoking age trend increased in adolescents, namely in the age group 10-14 years old.[12]. This shows that the city of Padang has increased the age of smokers compared to Indonesia as a whole.

In the city of Padang, there are still many people who smoke so it is easy to be imitated by teenagers but it is still considered as taboo and people are afraid to do it in public. This could result in the proportion of teenage smoking being *underestimated*. It may be that the actual numbers occurring in adolescents are greater than the numbers obtained now. This might be caused by several factors, including the knowledge and attitudes of people about smoking. Attitude such as being not open in addressing smoking behavior resulting in helath problems and even death something that does not want to be happened.

Table 3. Description of Mass Media Exposure, Parents 'Behavior, and Peers Resilience to Adolescent Non-Smoking in 2017

No	Variable	Cumulative Probability Survival	p-value (log rank)	Crude HR (95% CI)
1	Mass Media:		0,150	0.8
	Often	0,978		(0. 6 – 1.1)
	Rarely	0,991		
2	Behavior of Parent		0,006*	1,6

	Smoking	0,991		(1,5 – 1,9)
	No Smoking	0,973		
3	Peers		0,426	0.7
	Smoking	0,981		(0,3 – 1,9)
	No Smoking	0,875		

*Note: * significant at the level α = 0.05*

Based on table 3, it can be seen that there is no significant statistical relationship between mass media exposure and peers with the resistance adolescent to not smoking. HRcrude value is 0.8 (95% CI: 0.6-1.1 and $HR_{crude\ is}$ 0.7 (95% CI: 0.3-1.9). In parental behavior, there is a statistically significant relationship with adolescent resistance to not smoking , but with $HR_{crude\ is}$ 1.6 (95% CI: 1.5 - 1.9).

Based on research conducted by Rachmat, Thaha & Syafar (2013) states that the role of parents greatly influences adolescent in smoking behavior and it appears that parents who smoke are related significantly with a higher risk of onset of smoking.[9] Risk of children to begin smoking with parents who smoke increases with the duration of their exposure to parental smoking.

The behavior of teenagers is also vary. There are some of them who are attractive , agile, fashionable, aggressive and creative in things that are useful, but there are also teenagers who like party and even screw up. In adolescence, they begin to struggle to release their dependence on parents and try achieve independence so that they can be acknowledge and recognized as an adult. At this time, parents are very essential in adolescence, parents are role models for adolescents in behavior. Poor family role models will lead to deviant behavior such as smoking.

Table 4. Final Models of Adolescent Resilience to Not Smoking in 2017

Variabel	B	SE	HR_adjusted (Exp B)	95% CI	p-value
Parent Behavior					
• Smoking	-0,510	0,180	1.6	1,4 – 1,9	0,005
• No Smoking					
Exposure mass					
• Increased	-3.,233	1.288	0.04	0,003 –	0,012

• Rarely				0,493	
• T_COV_*Mass Media	0.220	0.096	1.25	1.03-1.51	0.022

*Note: * significant at the level α = 0.05*

Based on table 4, it can be seen that statistically there are no significant relationship between mass media exposure and adolescent non-resistance smoking. The HR_{crude} of 0.8 (95% CI: 0.6-1.1. Meanwhile, parental behavior, there is a statistically significant relationship with adolescent resistance to not smoking with HR_{crude} of 1.6 (95% CI: 1.5-1.9), meaning that adolescents with parents who smoke have a 1.6 times higher risk of not being able to survive not smoking compared to adolescents with non-smoking parents

Based on Table 4. mathematical models of adolescent non-smoking endurance regression obtained from the results of the study this is as follows:

$$h(t, x) = h_0(t) * e^{(b^1 x^1 + b^2 x^2 + \cdots b i x i)}$$

$$h(t, x) = h_0(t) * e^{(-0,510 * \text{parent who smike} -3,233 * \text{frequently exposed to mass media} + 0,220 * T\_Cov * \text{ rarely exposed to mass media})}$$

Interpretation of Exp B as Hazard Ratio (HRadjusted)which has been controlled by other independent variables in the regression model above can be expressed as follows: a. Risk of not being able to survive not to smoking in adolescents with smoking parents more of 1.6 times (95% CI: 1.4-1.9) compared to adolescents with non-smoking parents. b. The risk of not being able to survive not smoke in adolescents who are often exposed to mass media is 1.25 times greater (95% CI: 1.03-1.51) compared to adolescents who are rarely exposed to mass media, but the risk of adolescents who are not being able to survive not to smoke in adolescents who are often exposed to mass media varies according to time (year)

Many factors cause teens to smoke. Basically smoking behavior is learned behavior. It means, there are parties who have a influence begin the socialization process. Smoking behavior is caused by internal and environmental (external) factors including family or parents, siblings or peers who smoke and cigarette advertisements in the mass media.[14–16]

Teenagers who have a close relationship with parents have better behavior control, because it is more possible for them to have good communication patterns between parents and teens. With good communication patterns, it is expected that harmonization of relationships in the family is created, especially between parents and adolescents. In line with the results of several studies which state that a closer relationship with parents is a protective factor against the incidence of teenage smoking A good relationship between

parents and adolescents encourages openness to convey everything, including smoking behavior. This provides an opportunity for parents to provide correct information.[14–21]

CONCLUSION

Mass media exposure is the most related factor in adolescent resistance to not smoking. Parental behavior is a factor that is related to adolescent resistance to not smoking. Peer is one of the determinants that greatly influences the substance, but statistically. the behavior of peers who smoke does not affect adolescents' non-resistance of smoking

SUGGESTION

Agents of socialization in smoking behavior are family andenvironment peer. Meanwhile, smoking behavior is more related to emotional aspects. Suggestions from this research are:

1. For parents who want their children not to smoke, then family members are not advised to smoke and provide positive confirmers when teens smoke.

2. Mass media exposure contributes considerably to adolescents to smoke, in this case the government is obliged to cut off access to cigarettes for adolescents by issuing regional regulations that do not allow cigarette advertising.

3. Smoking behavior is based more on emotional considerations. Related to this problem preventive and curative efforts should not use cognitive approaches such as providing information on the dangers or negative effects of smoking. On the other side, affective touches need to be done.

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