

Determinants of Tobacco Use among Adolescents and Young Adults in Indonesia: An Analysis of IFLS-5 Data

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Abstract

Background: The danger of tobacco use to health has been globally known. However, its prevalence especially in developing countries including Indonesia remains high. This study aims to investigate determinants of tobacco use among adolescents and young adults in Indonesia. These age groups are essential since most regular smokers initiated to smoke at these ages. **Methods:** This study utilized IFLS wave 5 data. A total of 7213 responses on tobacco use from respondents age 15-24 years old were taken into analysis. Association between tobacco use with sociodemographic, religious, and ethnic identity was determined by using binary logistic regression. **Results:** Prevalence of tobacco use was 25.1%. The fully adjusted model showed factors that associated with tobacco use were age, sex, educational attainment, marital status, having smoking parents, and Madurese ethnicity. **Conclusion:** Tobacco use was prevalent among adolescents and young adults in Indonesia. Madurese was the only ethnic group associated with tobacco consumption in Indonesia. Appropriate design of interventions, therefore, is needed to target these subgroups.

Keywords: Tobacco, adolescent, young adult, determinant

Introduction

Tobacco use remains a problem that needs attention because of its high prevalence, especially in developing countries including Indonesia.^[1] According to Global Adult Tobacco Survey (GATS) 2011 report, the prevalence of tobacco smoking in Indonesia is 34.8%. While smokeless tobacco use prevalence is 1.7%.^[2] The negative impact on health due to tobacco consumption has been globally known. Tobacco use has been suspected as the cause of lung cancer, coronary heart diseases, and reproductive health problem among women.^[3] Burden caused by tobacco-related diseases has been hindering economic and social development, especially in low and middle-income countries.

Although the Indonesian government has taken preventive efforts, the prevalence of tobacco use remains high and even rising among young age citizens.^[4] The young citizens especially adolescents (15-19 years old) and young adults (20-24 years old) have been increasingly vital in the context of Indonesian development since this country is experiencing a demographic bonus phenomenon. Demographic bonus is a phenomenon where a country has a significantly larger young and productive-age population compared to its counterparts.^[5] Adolescents and young adults are vulnerable groups considering tobacco addiction mostly starts at this age range.^[6]

Several factors are associated with tobacco use behavior such as age, sex, educational attainment, economic status, residential geographic condition, and family member influence.^[7-9] Various studies on factors driving tobacco consumption have been conducted in Indonesia.^[7,8,10] The results were mostly in conjunction with other studies conducted around the world. However, very few (if not none) of them investigated the correlation between cultural and religious factors, such

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as ethnic identity and religion, with tobacco consumption using nationally representative data.^[1,7,10,11] These cultural and religious factors have emerged as important determinants of tobacco use.^[12,13]

The characteristics of Indonesia that are composed of diverse ethnic groups and religious beliefs emphasize the need for diversification of tobacco control strategies. The intervention strategies should be appropriately designed for each subgroup.^[7,11] Preventing adolescents and young adults from using tobacco is a strategic action that will reduce the overall prevalence of tobacco use since most smokers initiate smoking behavior at these ages.^[10]

In light of the above, this study aims to investigate factors associated with tobacco use among adolescents and young adults in Indonesia using nationally representative data. Sociodemographic factors, residential location, family member influence, as well as ethnic identity, and religious belief were included as the predictors.

Methods

Data source

This study utilized the Indonesia Family Life Survey wave 5 data (IFLS-5). IFLS 5 survey was conducted by RAND Corp from the United States in cooperation with Universitas Gadjah Mada in Indonesia. The survey was fielded between October 2014 and April 2015. The latest data update was made on April 12, 2017. The survey included 13 provinces and 30,000 individuals. With a 90% response rate, the IFLS-5 sample was claimed to be representative of about 83% of the Indonesian population.^[14] The data are available at <https://www.rand.org/well-being/social-and-behavioral-policy/data/FLS/IFLS/ifls5.html>.

Outcome variable

The dependent variable was tobacco use behavior among Indonesian adolescents and young adults. The respondents were considered to be having tobacco use behavior when they have had the habit of smoking cigarettes or smoking tobacco using pipes or chewing tobacco, both in the present and in the past. The response

to this variable was dichotomous which was coded 0 for “no” and 1 for “yes”.

Covariates

The covariates included in this study were age, sex, education, marital status, religion, place of residence, ethnicity, and the presence of smoking parents. All the covariates were treated as categorical variables. The education variable was defined as the highest level of education attained or being attended by the respondents when the survey was conducted.

Data Analysis

Responses analyzed in this study were limited to answers given by respondents with ages range 15-19 (adolescents) and 20-24 yearsold (young adults).^[15] The initial stage was cleaning the data from incomplete responses. This stage yielded a total of 7213 observations (N = 7213) for analysis. Descriptive statistics were conducted to illustrate the characteristics of respondents. Since all the variables were categorical, the chi-square test was conducted to investigate the correlation between the outcome and covariates. Covariates included in this study were those that showed a significant correlation with the tobacco habit variable in the bivariate analysis ($p < .05$). A collinearity test was performed to ensure that there was no collinearity occurred between the variables. The crude and adjusted odds ratios were determined using binary logistic regression to determine the association between the outcome and covariates. All the statistical analysis was conducted using SPSS software version 19.

Ethic Approval

The ethical approval was granted by International Review Boards (IRBs) in the United States and Universitas Gadjah Mada in Indonesia.^[16]

Results

The descriptive analysis revealed that the prevalence of tobacco use behavior among adolescents and young adults in Indonesia was 25.1% (n = 1809). Table 1 presents the results of the univariate analysis.

Table 1. Respondents' characteristics (N=7213)

		Frequency	%
Tobacco use	No	5404	74.9
	Yes	1809	25.1
Age	15-19	3739	51.8
	20-24	3474	48.2
Sex	Female	3871	53.7
	Male	3342	46.3
Education	Elementary	713	9.9
	Junior High School (year 9)	1663	23.1
	Senior High School (year 12)	3728	51.7
	University	1109	15.4
Marital status	Not yet married	5184	71.9
	Married	1959	27.2
	Divorced	70	1.0
Religion	Islam	6259	86.8
	Catholic	77	1.1
	Protestant	249	3.5
	Hindu	305	4.2
	Budha	8	.1
	Other	315	4.4
Residence	Rural	2786	38.6
	Urban	4427	61.4
Ethnicity	Toraja	276	3.8
	Batak	199	2.8
	Chinese	371	5.1
	Sasak	260	3.6
	Balinese	319	4.4
	Madurese	283	3.9
	Sundanese	900	12.4
	Javanese	2763	38.3
	Other	1842	25.5
Having smoking parents	No	2550	35.4
	Yes	4663	64.6

The proportion of tobacco use in each determinant's category is presented in table 2.

Table 2. The proportion of tobacco use in each category of determinants (N = 7213)

		Tobacco use				X ²
		No		Yes		
		Frequency	%	Frequency	%	
Age	15-19	3023	80.9	716	19.1	145.298***
	20-24	2381	68.5	1093	31.5	
Sex	Female	3835	99.1	36	.9	2593.194***
	Male	1569	46.9	1773	53.1	
Education	Elementary	464	65.1	249	34.9	80.728***
	Junior High School	1194	71.8	469	28.2	
	Senior High School	2832	76.0	896	24.0	
	University	914	82.4	195	17.6	
Marital status	Not yet married	3789	73.1	1395	26.9	33.078***
	Married	1561	79.7	398	20.3	
	Divorced	54	77.1	16	22.9	
Religion	Islam	4712	75.3	1547	24.7	29.414***
	Catholic	55	71.4	22	28.6	
	Protestant	186	74.7	63	25.3	
	Hindu	246	80.7	59	19.3	
	Budha	6	75.0	2	25.0	
	Other	199	63.2	116	36.8	
Residence	Rural	2049	73.5	737	26.5	4.561*
	Urban	3355	75.8	1072	24.2	
Ethnicity	Toraja	199	72.1	77	27.9	17.282*
	Batak	152	76.4	47	23.6	
	Chinese	276	74.4	95	25.6	
	Sasak	200	76.9	60	23.1	
	Bali	235	73.7	84	26.3	
	Madura	231	81.6	52	18.4	
	Sunda	658	73.1	242	26.9	
	Javanese	2109	76.3	654	23.7	
	Other	1344	73.0	498	27.0	
Having smoking parents	No	1970	77.3	580	22.7	11.442**
	Yes	3434	73.6	1229	26.4	

*** $p < .001$; ** $p < .01$; * $p < .05$

The result of chi-square test in table 2 showed that the variables that significantly correlated with tobacco use variables were age ($p < .001$), sex ($p < .001$), education ($p < .001$), marital status ($p < .001$), religion ($p < .001$), place of residence ($p < .05$), ethnicity ($p < .05$), and having smoker parents ($p < .01$). These variables were then taken into binary logistic regression to determine predictors of tobacco habit among adolescents and young adults in Indonesia.

Unadjusted and Adjusted Odds of Factors Influencing Tobacco Use

The multicollinearity test result indicated that there was no collinearity issue with the variables included in the logistic regression. The tolerance values were above .10 and the Variance Inflation Factors (VIF) were all below 10.00. Table 3 illustrates the findings of binary logistic regression between tobacco use as the dependent variable and the predictors.

Table 3. Results of binary logistic regression (N = 7213)

		Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age	15-19 (Ref.)	-	-
	20-24	1.938 (1.739-2.160)***	3.560 (3.016-4.202)***
Sex	Female (Ref.)	-	-
	Male	120.378 (86.099-168.307)***	280.500 (191.463-410.943)***
Education	Elementary (Ref.)	-	-
	Junior high school (year 9)	.732 (.607-.883)**	.565 (.420-.760)***
	Senior high school (year 12)	.590 (.497-.700)***	.398 (.302-.525)***
	University	.398 (.320-.495)***	.199 (.142-.279)***
Marital status	Not yet married	-	-
	Married	.693 (.611-.786)***	2.166 (1.671-2.809)***
	Divorced	.805 (.459-1.411)	2.438 (.743-7.999)
Religion	Islam (Ref.)	-	-
	Catholic	1.218 (.741-2.004)	1.588 (.815-3.095)
	Protestant	1.032 (.771-1.381)	1.008 (.640-1.587)
	Hindu	.731 (.547-.976)*	3.134 (.854-11.504)
	Budha	1.015 (.205-5.036)	1.839 (.147-22.983)
	Other	1.775 (1.402-2.248)	1.129 (.785-1.624)
Residence	Rural (Ref.)	-	-
	Urban	.888 (.797-990)*	.975 (.834-1.139)

Cont... Table 3. Results of binary logistic regression (N = 7213)

Ethnicity	Toraja (Ref.)	-	-
	Batak	.799 (.525-1.216)	.602 (.340-1.064)
	Chinese	.890 (.626-1.264)	.718 (.452-1.140)
	Sasak	.775 (.525-1.146)	.807 (.460-1.414)
	Balinese	.924 (.643-1.327)	.788 (.460-1.349)
	Madurese	.582 (.390-.868)**	.161 (.040-.643)*
	Sundanese	.950 (.703-1.285)	.896 (.597-1.346)
	Javanese	.801 (.607-1.058)	.695 (.480-1.008)
	Other	.958 (.722-1.270)	.733 (.496-1.082)
Having smoking parents	No (Ref.)	-	-
	Yes	1.216 (1.085-1.361)**	1.352 (1.150-1.590)***

Ref. = Reference; OR = Odds Ratio; CI = Confidence Interval; *** $p < .001$; ** $p < .01$; * $p < .05$

Table 3 presents the crude and adjusted odds ratios. The results showed that in the full adjusted model, age, sex, education, marital status, being a Madurese, and having smoking parents remained associated with tobacco use behavior. The age category showed that the older age group (20-24) had a higher likelihood of having tobacco use behavior compared to the younger age group. All categories in the education variable were statistically significant with higher odds in the lower level of education both in crude and adjusted results. The religion and place of residence variables were attenuated in the fully adjusted model.

Discussion

The result of this study revealed that the prevalence of tobacco use among adolescents and young adults in Indonesia was 25.1%. This result supports the finding of the Indonesia Global Adult Tobacco Survey (GATS) 2011 that estimated 26.6% of tobacco use prevalence for 15-24 age group.^[2] This study found that factors associated with tobacco use were age, sex, educational attainment, marital status, ethnicity, and the presence of smoking parents. The older age group tends to have higher odds of tobacco consumption as compared to the younger age group. Whereas males (53.1%) were found to have a higher prevalence of tobacco use than

females (.9%). These findings are in agreement with other tobacco use research in China, Nepal, Ethiopia, and Russia.^[7,9,17-19] This phenomenon is feasibly caused by the perception of male young adults that being a smoker means being a “real man”.^[9,20] Social acceptance is another consideration for male young adults to become social smokers.^[9,20,21] It is very common for adolescents offering cigarettes to start an interaction with and show solidarity to their peers.^[22,23]

Respondents with low educational background were found to have higher odds of tobacco use behavior compared to those with higher educational attainments.^[12,24,25] This finding is aligned with the results of previous studies in the United States, the Netherlands, India, and Iran that indicated a higher level of education was associated with a lowered level of tobacco consumption. However, this finding is different from the previous study conducted in Indonesia that found respondents with higher educational backgrounds had a higher odds of tobacco use.^[7] This phenomenon could be caused by the influence of religious and cultural factors that had not been included in the previous tobacco use studies in Indonesia. The concentration of tobacco consumption has also been shifted from those who come from higher socioeconomic status to those in lower socioeconomic status.^[12] Assuming that people with high status would

have longer education years, this finding confirms this theory.

Marital status was found to have a significant association with tobacco use both in the unadjusted and adjusted model. Married respondents were found to have .693 odds in the unadjusted model and increased to 2.166 of odds in the fully adjusted model. This finding corroborates previous studies' results that suggested people who live with a partner or spouse tend to have higher odds of tobacco use.^[12,17,26]

This study detected a significant correlation between tobacco use behavior and the Madurese ethnic group (OR .161). This finding has been adding to the literature on the association between tobacco use and a certain ethnicity in Indonesia utilizing nationally representative data. This result may be because Madura island, the place where most Madurese reside, is a vast area of a tobacco plantation. Tobacco farming contributes approximately 60-80% of farmers' income in Madura.^[27] Living near or working in tobacco plantations has been associated with tobacco use behavior among adolescents and young adults.^[28] Another possible cause is the socioeconomic condition of Madurese in Madura island whose mostly are in the low-middle class.^[29] Earlier research reported that low-middle socioeconomic populations were associated with tobacco consumption.^[30]

Having smoking parents was also determined to be a significant predictor of tobacco use (OR 1.352). The family role, especially parents, is very important in shaping children's attitudes towards tobacco use. Since children tend to imitate their parents' behavior, smoking parents will increase the probability for their children to become smokers. This finding is in conjunction with earlier studies in Ethiopia, and Russia.^[9,10,31]

The determinants of tobacco use in Indonesia have been investigated in various studies. However, very few (or even none) of them analyzed the association between religious belief and ethnicity with tobacco use behavior. Considering the rising prevalence of tobacco consumption and the fact that Indonesia is a country with diverse ethnic groups and religions the need to examine the association between these variables has been emphasized. This study is one among the few (if not the first) that addresses the gap in the literature about the association between religious belief and ethnic

identity with tobacco use behavior among adolescents and young adults in Indonesia. These groups of age are vital in tobacco control efforts since young age smoking initiation has been proven to increase the probability of becoming a regular smoker in adulthood.^[32] Additionally, this study uses nationally representative data gathered with an internationally recognized instrument. However, there are several potential limitations of this study. First, IFLS-5 covered only 13 out of 34 provinces in Indonesia. Hence, people in provinces out of the study are underrepresented. Second, several important predictors of tobacco use were absent such as the presence of smoking peers, self-efficacy, and attitude towards tobacco use behavior. Finally, this study was unable to present the causal effects between variables under investigation.

Conclusion

This study has shown a high prevalence of tobacco use behavior among adolescents and young adults in Indonesia. Male young adults (20-24 years old) with low educational attainment, married and having smoking parents were found to have higher odds of tobacco use. Among ethnic groups in Indonesia, only Madurese identity was associated with tobacco consumption. Appropriate design of interventions, therefore, is needed to target these subgroups. The tobacco control interventions are expected to reduce the prevalence and prevent young age smoking initiation that will result in the decline of tobacco use-related morbidity and mortality in Indonesia.

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