Factors of Non-Smoking Students Grade 7-12 Susceptible to Smoking Cigarette in Indonesia Using Data Global Youth Tobacco Survey 2019

Tati Suryati, **Endang Indriasih, Ingan Ukur Tarigan,**
Made Ayu Lely, Debri Rizki Faisal
National Research and Innovation Agency Indonesia
Public Health and Nutrition Research Center-Health Research
tati.suryati@brin.go.id, endang.indriasih@brin.go.id, ingan.ukur.tarigan@brin.go.id,
made008@brin.go.id, debr001@brin.go.id,

Abstract

The number of students who smoke cigarettes continues increase, in line with achievement industrial target of tobacco products. The aim of this study is to determine factors that cause students who do not smoke susceptible to smoking (SS) in the future. This information will direct tobacco control prevention programs. A cross-sectional survey data from 148 schools and 379 classrooms, total 9922 eligible students in grades 7-12. Simple and multiple logistic regression analyses were conducted to factor associated with SS among never smoking students. Descriptive statistics, and adjusted odds ratios with 95% confidence intervals were reported. There were 5863 students who do not smoke of whom 454 SS; girls 78.25% and 58% were grade 7-9. The students who; were boys (OR=1.55, p<0.001), thought cigarettes not harmful (OR=3,79, p<0.001), current use e-cigarettes (OR=3.62, p<0.001), current consumes shisha (OR=2.92, p<0.001), ever got free cigarette/ voucher (OR=2.46, p<0.001), thought safe to smoke only one or two years and quit (OR=2.12, p<0.001), have item of tobacco product (OR=1.8, p<0.001), exposed cigarette advertisement/ promotion at music concert (OR=1.72, p<0.001), thought smoking helps people feel more comfortable (OR=1.66, p<0.001), thought Second Hand Smoke (SHS) are not harmful (OR=1.5, p<0.001), exposed SHS in public places (OR=1.46, p<0.001), exposed to cigarettes advertisement in internet/social media (OR=1.3, p<0.015). Factors that influence students not to smoke susceptible to smoking cigarettes are students who; lack of knowledge the dangers of tobacco consumption, currently use e-cigarettes, currently consumes shisha, exposed of cigarette advertising and promotion, and exposed to SHS in public places.

Keywords
Non-smoker, Susceptible to smoking, Adolescent, Students and Indonesia

1. Introduction
Globally smoking remains one of the most important risk factors for morbidity and premature death. One in six deaths in the world are related to non-communicable diseases caused by tobacco use. In 2019, it is estimated there are more than 1 billion current smokers globally, this will continue to increase over the next few decades (Reitsma et al. 2021; Jha and Peto 2014).

In developing countries with stable population growth, number of tobacco users continues to increase even though prevalence trend is decrease significantly. This is in line with aggressive marketing efforts of tobacco industry (WHO, MPOWER 2008). If there are no prevention efforts, it is predicted that by 2030 tobacco will kill more than eight million people per year. The prediction is most of these deaths will occur in low- and middle-income countries that will have a relationship to economic and social development. The enormous health and economic consequences of the global tobacco epidemic, making tobacco control a clear and urgent public health priority (Mather CD, Loncar D 2006; Jha and Peto 2014).

Global Youth Tobacco Survey data from 143 countries found there has been mixed progress in reducing prevalence of tobacco use in this age group. Important information obtained is that adolescents and young people are more susceptible to addiction than older age groups. Results study from 204 countries shows that in 2019 an estimated 82.6% (82 1–83·1) of current smokers started smoking between ages of 14 and 25 years. In 95% of the observed

countries confirm men started smoking earlier than women (Reitsma et al. 2021).The earlier the age of starting smoking (even if only a few times) has potential to increase prevalence of current smoker in their twenties. This happens because of high nicotine addiction due to long smoking period also influence of intensity and quantity of tobacco consumption. A further impact could be a lower desire to quit smoking when they reach forties (Hu et al. 2020).

To address problem of tobacco epidemic, a broad smoking cessation program is highly recommended to reduce morbidity and mortality from non-communicable diseases and from tuberculosis, as well as increase tobacco excise (Jha and Peto, 2014). Under certain conditions preventing schoolchildren and youth from starting smoking tobacco is more effective and cost less than helping users quit smoking. An important public health challenge is understanding factors that influence never-smokers' students susceptible to start smoking, this is very important for determining future prevention programs. Study susceptibility in Poland proved that personal, social and environmental factors are highly correlated with SS. When dealing with youth, efforts should be focused on groups at risk, with a comprehensive approach including multiple factors and involving school personnel, parents and group leaders in tobacco control activities (Polańska et al. 2016). Information on youth susceptibility to smoking is needed for preventive intervention programs, but few studies have been conducted on this matter, especially in LMICs (Guindon et al. 2008), (Veeranki et al. 2014).According to the existing data considering smoking, susceptibility has been shown to be modifiable through interventions (Meschack AF et al 2004).Effective prevention targets are aimed at junior high school students who have never smoked and high school students, with the aim of changing high-risk to low-risk cognitions regardless of past behavior (Choi WS et al. 2001).

Indonesia is the second largest cigarette market in the world, and is also one of the few countries that broadcasts cigarette advertisements on television, while the application of 40% of packaged health warning images is considered to have no significant progress. In terms of cigarette taxes, Indonesia is among the lowest in the world (Astuti et al. 2020). The number of current smokers from various tobacco products is 70.2 million, of which 34.5% of the adult population. While 19.2% of young people aged 13-15 years are smokers. Although the prevalence of smoking has decreased, there has been an increase in the number of adult smokers by 8.8 million people, from 60.3 million in 2011 to 69.1 million smokers in 2021. This phenomenon is in line with an increase in exposure to cigarette advertising via internet which increased by more than 10 times in the last 10 years (from 1.9% to 21.4% in 2021) (GATS 2021, GYTS 2019 Fact Sheet).Data national health survey (National Institute Health Research and Development, 2018) shows in population of smokers aged ≥10 years, percentage of first-time smoking 15-19 years was 52.1 (51.8-52.40), and the type of tobacco smoked 67.8 (67.4-68.2) was cigarettes. Average number of cigarettes smoked per day for male was 12.94 (± 8.13) equivalent of one pack of cigarettes, and women 8.5 (± 7.42).Research on the relationship between adolescent perceptions (aged 13-18 years) about cigarette advertising and smoking initiation that was heal in Yogyakarta city show that; exposure to cigarette ads had an association with smoking initiation only (OR 1.27), an association between perception of tobacco ads encouraging youths to smoke and smoking initiation (OR 2.70) (Prabandari and Dewi 2016). Evidence of factors related to smoking susceptibility of schoolchildren is rare in Indonesia.

1.1 Objectives
This study aims to determine factors associated with students in grades 7 to 12 who do not smoke susceptible to smoking tobacco in the future, with national representatives.

2. Literature Review
The results of several study related to non-smoker adolescents who are prone to using tobacco products and the factors that influence it.
The main basis of this literature review is the importance of an international perspective about adolescent susceptibility to smoking. Veeranki, Mamudu, Anderson, and Zheng used Global Youth Tobacco Survey (GYTS) data from 168 countries to examine the prevalence and correlates of susceptibility to smoking among never-smoking youth ages 13 e15 years. A substantial percentage of these youth (12.5% or 1 in 8) were susceptible to smoking, and susceptible youth were more likely to be male, exposed to parent or peer smoking and secondhand smoke, and tobacco industry promotions (Veeranki et al. 2014). One important implication of Veeranki et al. findings is that adolescent and adult tobacco use risk are linked, because exposure to parent smoking and secondhand smoke were significantly related to youth susceptibility. According to the Veeranki et al. findings that a smaller share of the population was covered by policies to ensure smoke-free environments (16%) or advertising bans (10%), which are elements that should reduce youth susceptibility.

The relation between antismoking media campaigns and smoking susceptibility could reflect the influence of some common third variable that is associated with both exposure to antismoking media messages and smoking susceptibility, importance of culturally specific factors.

Finally, the Veeranki et al. findings demonstrate the potential importance of culturally specific factors. For example, the magnitude of gender differences in susceptibility varied considerably across countries. These cross-national variations caution against relying solely on "one size fits all" intervention strategies (Chassin et al. 2014)

The result study from Kinga Polanska, Malgorzata Znyk, Dorota Kaleta: the following factors were not significant correlates of tobacco use susceptibility in any of the analyzed countries: parental education, age of the students, parental smoking, exposure to passive smoking at home, presence of the smokers inside school or outside school on school property, knowledge about harmful effects of active smoking, perception of difficulty of quitting by smokers and school discussion of the reasons why people use tobacco (p > 0.05) (Polanska et al. 2022)

The literature has shown the social factors, and those related to educational and policy issues as well as to attitudes regarding tobacco use were strongly, and consistently across countries, correlated with tobacco use susceptibility. Slight differences in susceptibility to tobacco use between the countries were related to: sex, money available for own expenses, exposure to advertisements or promotions at points of sale and opinion that people who smoke have more friends (Polanska et al. 2022)

Hui G. Cheng, et al (2021) describes adolescents' susceptibility to tobacco use. The results of the study explain that 65% of adolescents who consume one tobacco product are susceptible to consuming more than one tobacco product. Adolescents are susceptible to consuming tobacco products, especially adolescents who currently consume cannabis and alcohol. In addition, adolescents who are affiliated with peers who consume tobacco products tend to be more susceptible to consuming tobacco products. This condition is closely related to the behavior and environment of adolescents living. This study also proves that cigarettes and e-cigarettes are the most susceptible to tobacco products in youth consumption. Based on demographic characteristics, older adolescent (15-17 years) is more susceptible to consuming all tobacco products compared to younger adolescents (12-14 years). In the future suggested, planning to prevent the consumption of tobacco products be carried out with a holistic approach to adolescent risk behavior (Cheng et al. 2021).

Studies on the effect of the FCTC ratification policy on the vulnerability of adolescents to use tobacco products were conducted in Gulf Cooperation Council (GCC) countries, including Kuwait, Bahrain, Oman, Saudi Arabia, Qatar, and the United Arab Emirates (UAE). The purpose of the study was to examine changes or trends in tobacco use in GCC countries and the relationship between vulnerability and FCTC ratification. The analysis uses GYTS data for the period 2001-2018 with a sample of 349,878 adolescents. The analysis results prove that adolescents' vulnerability to start using tobacco has decreased significantly since the implementation of the FCTC ratification policy (2006), especially in Bahrain and Qatar. In addition, it was explained that exposure to cigarettes in public places increased the vulnerability of adolescents to use tobacco, especially in Bahrain and Kuwait (AOR=1.6) and Qatar (AOR=1.9), and the UAE (AOR=2.1). Social media and the promotion of industry tobacco also influence adolescent susceptibility to tobacco use. The impact of the implementation of FCTC policies varies in GCC countries. The results show that the implementation of tobacco control policies independently affects the initiation of tobacco use.(Monshi et al. 2022)

3. Methods

The Global Youth Tobacco Survey (GYTS) is a part of the Global Tobacco Surveillance System (GTSS), which was developed to track use of various tobacco products and increase country capacity to design, implement and evaluate tobacco control and prevention programs nationally, and can even be compared across countries or regional. It is a cross-sectional school-based survey for student 13-15 years old, representing national data. The questionnaire consists of a core (a standard set of survey questions used in all locations) and each country can add questions as needed.

Variables

Analysis with inclusion criteria of students who have never smoked – participants who answered "no" to the following question "Have you ever tried or experimented with smoking, even a puff or two?"
All variables were produced based on the questionnaire that is included in the Supplementary Material. With regard to the predictor variables, the aim was to convert information from the questionnaire into binary variables. The exceptions were information about electric-cigarette (e-cigarette) which had three categories; no information, from advertisement, from a friend/ shopkeeper/ promotion event.

The dependent variable considered in the current study was susceptibility to tobacco product use as adopted from Pola, K. et al 2016 and Polanska. K, Znyk. M et al 2022 (Polanska et al. 2022). It was based on two questions:
"If one of your close friends offer you cigarette products, will you accept it?"
"At some point during next 12 months, do you think you will consume cigarette at any form?"
For each question, the following answer options are possible: "Definitely no", "Probably no", "Probably yes", and "Definitely yes". Students who answered "definitely no" to both questions were coded as non-vulnerable and the others considered susceptible to tobacco use.
Independent variables include 27 variables from the questionnaire which consist of;
*Personal factors; gender, ages, school grades, pocket money per week, parents at least one consumes tobacco.
*Use other smoking tobacco; current use shisha, current use electric cigarette.
*Expose of second-hand smoke (SHS); at home, in close or open public places
*Perception of tobacco consumption; SHS are harmful to health, smoking help people feel more comfortable, cigarette harm to health, if smoking only one or two years then quitting will not be harmful, think not start smoking when sees anti-smoking message on cigarettes pack
*Education harm tobacco at school; taught danger of consuming tobacco at school past 12 months
*Anti-tobacco advertisement; seen or hear anti-tobacco messages on various media, seen or hear anti-tobacco messages on various events, seen health warning on cigarette packs.
*Attitude toward Tobacco Advertisement Promotion and Sales (TAPS); information/ advertisement about e-cigarettes, seen cig ads/ promo on tv the past 30 days, seen cig ads outdoor the past 30 days, seen cig ads internet/social media the past 30 days, seen ads or promo cig product in sales centers, seen cig ads/ promotion at sporting events, seen cig ads/ promotion at music concert, have an item of tobacco product/ cig logos.

Sampling
Multi-stage cluster sampling was conducted, with each school having a probability compared to the number of students enrolled. There are three geographical strata: the Java-Bali region, Sumatra and other parts of East Indonesia. The Sampling Unit (PSU) consists of 50 schools from each stratum. The sample frame consisted of all Junior and Senior High Schools consisting of grades 7-12. Class sampling was carried out during a survey visit by a simple random method. There were 148 sampling schools and 379 classrooms. All students who were present in class during survey, voluntarily participated in filling out the answer sheet. In the previous GYTS survey, it was only carried out in grades 7-9, but many students were less than 13 years old, so they did not meet the inclusion criteria of 13-15 years. Therefore in 2019 the sample school was expanded to grades 10 -12.The overall response rate was 91.0%. A total of 9,992 eligible students in grades 7- 12 completed the survey. After the missing data was removed, number of students who had never smoked was 5863 (58.6%), of whom are susceptible to smoking 454 (7.74%).

Data analysis
Univariate analysis was carried out with the chi-square test to see relationship between each independent variable and dependent. Significant variables will be used as candidate variables in multivariate analysis. The logistic regression test using backward method was carried out in multivariate analysis, until a fit final model (indicating the association between dependent and independents variables) were presented as adjusted odds ratios (aORs) with 95% confidence intervals (Cis), significance of p value <0.05. In conducting the analysis, we have considered weighted variables using the Stata.13 application with survey command to get representative results.

Ethics
This study received ethical approval number.LB.02.01/2/KE.315/2019 dated 7 August 2019 from the Health Research Ethics Commission, Health Research and Development Agency, MoH. Research Permit from the Directorate General of Politics and Public Administration, Ministry of Home Affairs RI, number.460.02/369/DU, on August 28, 2019. The Ministry of Education and Culture provided support in the formal letters to the District Education Offices and schools that were sampled.

4. Data Collection

Data collection was carried out on public and private schools at 30 of the 34 existing provinces. The survey was carried out in 2019 from October 28 to December 1st, supported by 53 data collectors (researchers and enumerators with minimum education graduated from a health diploma). The survey procedure is designed to protect student privacy by allowing anonymous and voluntary participation. Students record their responses directly on scannable answer papers. Research assistants went to classes in each selected school and explained the procedure for completing the questionnaire.

5. Results and Discussion

Characteristic of non-susceptible and susceptible student

The characteristics of non-susceptible tobacco smoke students (as in Table.1) are as follows; the highest proportion is girls, based on age group the highest proportion is in group 13-14 years. There are more susceptible students in grades 7 to 9 than in grades 10 to 12. More of them were students who do not have personal pocket money or got a maximum of 50,000 IDR per week. Although non-susceptible students do not smoke cigarettes, some of them smoke shisha as much as 1.26% and use electric cigarettes 2.88%. As many as 81.7% of them were also not exposed to SHS at home, but 20% of them were still exposed to SHS in public places.

The characteristics of susceptible students to cigarettes smoking are inversely than non-susceptible, where the largest number are boys in youngest age group (11-12 years), and stayed in grade 7 to 9 of education. Most of them have parents or caregivers who (at least one person) consume tobacco. Most of the susceptible students currently smoke shisha or e-cigarettes, besides that they are also exposed to SHS at home and in public places.

Overall, non-susceptible students have a good perception of the dangers of tobacco consumption. About 78.9% of them have a perception that SHS is harmful to health, 90.3% of them think they will not start smoking when they see an anti-smoking message on cigarettes pack, 91.1% do not agree that smoking makes them feel more comfortable, 64.3 % of them thought smoking was harmful to health and 58.2% disagreed with the statement if smoking only one or two years, then quitting was not harmful to health.

Perceptions or thoughts of susceptibility students towards smoking consumption are still very lacking. These are the description; most of them think that if SHS is not harmful to health, they also do not agree with the statement that they will not start smoking if see the pictorial health warnings on cigarette packs. Most of them agree, that smoking makes you feel more comfortable, and smoking is not harmful to health. The majority of them agree that smoking just a year or two and then quitting won't do any harm.

The behavior of non-susceptible students towards TAPS is as follows; Most (63.1%) did not see or pay attention to cigarette advertisements on internet or social media in the last 30 days, 88.2% of them also did not see cigarette advertisements or promotions at sporting events, 89.6% did not see or pay attention to advertising or promotion of cigarettes at music concerts. It is interesting to know 92% of them never owned an item with a cigarette image or logo, also 97.3% of them never got an over free cigarettes or discount coupons or vouchers to buy cigarettes.

The behavior of students susceptible to tobacco smoke towards TAPS is as follows; most of them have seen or paid attention to advertisements or promotions of cigarettes on the internet or media in the last 30 days, also at counters where cigarettes are sold. Most of them also see advertisements or promotions of cigarettes at sporting events and music concerts. They also collect goods with images or logos of cigarettes, and they have received offers of free cigarettes or discount coupons/vouchers to buy cigarettes.

Multivariate analysis results

The fix multi variate analysis show (Table. 2) that boys' students were more likely to be susceptible than girls (OR,1.55, 95% CI, 1.24-1.94). Students who exposed to SHS in closed or open public places are at risk of becoming more susceptibility (OR, 1.46, 95% CI, 1.15–1.85). Those who believes smoking helps people comfort were more likely to be susceptible to smoking (OR, 1.66, 95% CI, 1.25 – 2.21) and who not believes that SHS are harmful (OR, 1.5, 95% CI, 1.19 –1.90). Student behavior towards TAPS also has potential to make students susceptible to tobacco smoke in the future, among others; student which have an item of tobacco product or logos more likely susceptible (OR, 1.80, 95% CI, 1.34-2.41), students who seen cigarettes advertisement or promotion at music concert were more

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likely susceptible (OR, 1.72, 95% CI, 1.31-2.26), and student who seen cigarettes advertisement at internet or social media were more susceptible (OR,1.30, 95% CI,1.05-1.61).

The odds of smoking susceptibility were higher in students who currently using e-cigarettes (OR, 3.62, 95% CI, 2.46-5.33), also students who currently using shisha (OR=2.92, 95% CI, 1.62-5.24) and students who ever received free cigarettes or discount coupons or vouchers to buy cigarettes (OR, 2.46, 95% CI, 1.60-3.77). A high probability of susceptible also occurs in students' perception; smoking is not harmful (OR, 3.79, 95% CI, 2.92-4.91), as well as students who think it is safe to smoke only one or two years, then quit (OR, 2.12, 95% CI, 1.72 – 2.60).

Discussions
Our study found that overall percentage of smoking susceptibility (SS) status among student ages 13–17-year were 7.7% (boys 13.1% and girls 6.3%). In this study, the data analysis covered the entire sample of students in grades 7 to 12, with an age range of 11 to 17 years. This result is slightly different (lower) from results of GYTS 2019 with a sample of students in grade 7 to 9 and inclusion of age 13-15 years; 7.9%.In Indonesia has decrease representation of susceptibility at age of 13-15, from 8.8% (2014) to 7.9% in 2019 (Factsheet Indonesia GYTS 2014, 2019).The proportion of students (13-15 years old) who are susceptible to cigarette smoke in Indonesia is lower than in the Southeast Asia Region (10.1%) (James L. Anderson et al, 2013). In Gambia prevalence of non-smoker student who susceptible to smoking were 33.9%, and in Vietnam about 11.2% (Jallow et al. 2019), (Hoang *et al.*, 2019).The comparison of SS with 7 to 12 grade samples is as follows; in Malaysia overall 13.9% (boys vs girls, 19.7% vs 9.2%), with the age group 12 - 19 years. In Poland with a proportion of 22% within age group 13-19 years., boys tend to be more susceptible than girls. Personal, social, and environmental factors are highly correlated with SS (Kuang Hock Lim et al, 2019). These differences are strongly influenced by social and cultural variations between countries, tobacco consumption control policies and the influence of TAPS, the difference in the age range of respondents in the sample taken, as well as differences in the definition of non-smoking (never tried/never smoked) so that it affects the prevalence of susceptibility (Chen P-L et al. 2009; Aslam S et al. 2014; WHO Thailand GYTS report 2015; Lim KH et al. 2019).

In our study proved that boys were more likely susceptible than girls, (OR,1.55, 95% CI, 1.24-1.94).This is in accordance with the results of study in Malaysia (OR, 1.49, 95%CI, 1.23-1.81), study in Taiwan girls vs boys (aOR, 0.53; 95% CI, 0.41–0.69) and in Poland (OR, 1.39, 95% CI, 1.15-1.67) (Kuang Hock Lim et al 2019; Hoang et al. 2019; Polańska et al. 2016).

Our study results show a very strong odds-onstudents' behavior who do not smoke cigarettes but use shisha and e-cigarettes, and students who ever received free cigarettes or discount coupons or vouchers to buy cigarettes.

E-cigarette users in Indonesia was increased tenfold between 2011 and 2021 in smokers aged over 15 years, from 0.3 percent to 3.0 percent. Its users currently reach 6.2 million people. In society, e-cigarette products are widely known as vape products (GATS Factsheet, 2021). For non-smokers, their main motivation for vaping is pleasure and popularity. However, it is possible there are various flavors are deliberately created as an attraction for beginners. These findings suggest that daily e-cigarettes use among never-smokers is an emerging public health in the future. There needs to be a strategy to ban TAPS to youth and non-smokers who are likely to be targets of current marketing strategies problem (Thomas E. Susan et al. 2017).

In conclusion, this study used a nationally representative sample to assess susceptibility smoking status students in grades 7 to 12 and its relationship to individual and external factors. This study provides evidence of the importance of banning cigarette advertising and promotion of cigarette products, in various media, to reduce the prevalence of smoking susceptibility among students. This study also proves the importance of increasing exposure to anti-smoking media among children and students from an early age. There needs to be increased supervision of the implementation of non-smoking zone policy, to prevent initiation of smoking in sc.

5.1 Numerical Results

Table. 1 Characteristics of Participants of the study

Predictors	Variables	Non-susceptible		Susceptible		OR	95% CI	P value
		n	%	n	%			
Personal								
Non-smoker students		5409	92,26	454	7,74			
gender	girls	4588	78,25	287	6,26	Ref		
	boys	1275	21,75	167	13,10	1,79	1,57 – 2,04	0,001*
age group	11-12 year	1014	17.30	98	9.66	1.36	0.98 – 1.89	0.061
	13-14 year	2051	34.98	151	7.36	1.01	0.75 – 1.36	0.928
	15-16 year	1890	32.24	139	7.35	1.01	0.74 – 1.37	0.935
	≥17 year	908	15.49	66	7.37	Ref		
school grades	7-9	3402	58,02	292	8,58	Ref		
	10-12	2461	41,98	162	6,58	0,83	0,73 – 0,95	0,004*
personal pocket money per week	< 50,000 IDR	4424	75,46	348	7,87	Ref		
	more	1439	24,54	106	7,37	0,94	0,79 – 1,12	0,537
parents/ caregivers (at least one) consumes tobacco	No	3469	59,17	255	7,35	Ref		
	Yes	2394	40,83	199	8,31	1,08	0,96 – 1,20	
Smoking status other than smoking tobacco								
currently use shisha in the past 30 days	No	5789	98,74	424	7,32	Ref		
	Yes	74	1,26	30	40,54	8,18	4,86 – 13,82	0,001*
current use e-cigarettes the past 30 days	No	5694	97,12	402	7,06	Ref		
	Yes	169	2,88	52	30,77	5,29	3,87 – 7,23	0,001*
Expose SHS								
exposed SHS at home	No	4791	81,72	363	7,58	Ref		
	Yes	1072	18,28	91	8,49	1,10	0,91 – 1,33	0,312
exposed SHS in (close or open) public places	No	4652	79,35	329	7,07	Ref		
	Yes	1211	20,65	125	10,32	1,37	1,17 – 1,60	0,001*
Perception of tobacco consumption								
SHS are harmful to health	Yes	4628	78,94	287	6,20	Ref		
	No	1235	21,06	167	13,52	1,86	1,63 – 2,12	0,001*
thought not to start when sees anti-smoking message on the pack	Yes	5297	90,35	251	7,35	Ref		
	No	566	9,65	203	8,30	1,07	0,96 – 1,19	0,180
perception smoking helps feel more comfortable	No	5345	91,16	370	6,99	Ref		
	Yes	518	8,84	84	14,84	2,07	1,68 – 2,56	0,001*
cigarettes harmful to health	Yes	3773	64,35	318	5,95	Ref		
	No	2090	35,65	136	26,25	4,24	3,57 – 5,03	0,001*
if smoking only one or two years then quitting will not be harmful	No	3416	58,26	418	7,64	Ref		
	Yes	2447	41,74	36	9,23	1,21	0,87 – 1,68	0,255
Anti-tobacco Adv								
seen or heard anti-tobacco messages on various media	Yes	4675	79,74	357	7,64	Ref		
	No	1188	20,26	97	8,16	1,05	0,88 – 1,27	0,542
seen or hears anti-tobacco messages on various events	No	1513	25,81	307	7,06	Ref		
	Yes	4350	74,19	147	9,72	1,28	1,11 – 1,47	0,001*
seen health warning on the cigarette packs	Yes	1333	22,74	116	8,70	Ref		
	No	4530	77,26	338	7,46	0,96	0,90 – 1,01	0,136
Education harm tobacco at school								
taught harm of consuming tobacco past 12 months	Yes	3650	62,25	282	7,73	Ref		
	No	2213	37,75	171	7,77	1,00	0,88 – 1,13	0,948
Attitude toward TAPS								
information about e-cigarettes	No information	3124	53,28	203	6,50	Ref		
	Adv at street or shop/ TV/ internet	1091	18,61	101	9,26	1,46	1,14 – 1,88	0,003*
	friend/ shop keeper/ promotion	1648	28,11	150	9,10	1,44	1,15 – 1,79	0,001*
seen cig adv/ promo on tv the past 30 days	No	2135	36,41	165	7,73	Ref		
	Yes	3728	63,59	289	7,75	1,00	0,93 – 1,07	0,973
seen cig adv outdoor the past 30 days	No	2399	40,92	183	7,63	Ref		
	Yes	3464	59,08	271	7,82	1,01	0,93 – 1,09	0,783
seen cig adv internet/social media	No	3700	63,11	245	6,62	Ref		

Predictors	Variables	Non-susceptible		Susceptible		OR	95% CI	P value
		n	%	n	%			
Personal								
the past 30 days	Yes	2163	36,89	209	9,66	1,27	1,14 – 1,41	0,001*
seen adv or promo cig product	No	2719	46,38	186	6,84	Ref		
in sales centers	Yes	3144	53,62	268	8,52	1,11	1,02 – 1,20	0,016
seen cig adv/ promotion	No	5171	88,20	358	6,92	Ref		
at sporting events	Yes	692	11,80	96	13,87	1,91	1,58 – 2,32	0,001*
seen cig adv/ promotion	No	5257	89,66	346	5,58	Ref		
at music concert	Yes	606	10,34	108	17,82	2,58	2,14 – 3,10	0,001*
have an item of tobacco product/	No	5395	92,02	367	6,80	Ref		
cig logos	Yes	468	7,98	87	18,59	2,72	2,20 – 3,36	0,001*
ever got cigarette/ discounted	No	5708	97,36	410	7,18	Ref		
coupons/ voucher	Yes	155	2,64	44	28,39	4,72	3,37 – 6,60	0,001*

* Indicates the variable that is correlated with dependent variable ($p < 0.05$)

Table.2 Analysis Multivariate

Predictors	Variable	OR	95% CI	P value
Personal				
gender	girls	Ref		
	boys	1,55	1,24 – 1,94	0,001
Smoking status other than smoking tobacco				
current use e-cigarettes	No	Ref		
the past 30 days	Yes	3,62	2,46 – 5,33	0,001
current use shisha	No	Ref		
in past 30 days	Yes	2,92	1,62 – 5,24	0,001
Expose SHS				
exposed SHS (in closed or	No	Ref		
open) public places	Yes	1,46	1,15 – 1,85	0,001
Perception of tobacco consumption				
cigarettes harmful to health	Yes	Ref		
	No	3,79	2,92 – 4,91	0,001
thought it is safe to smoke only one	No	Ref		
or two years and quit after that	Yes	2,12	1,72 – 2,60	0,001
thought smoking helps people	No	Ref		
feel more comfortable	Yes	1,66	1,25 – 2,21	0,001
SHS are harmful to health	Yes	Ref		
	No	1,50	1,19 – 1,90	0,001
Attitude towards TAPS				
ever got cigarette/ discounted coupons/ voucher from cig company	No	Ref		
	Yes	2,46	1,60 – 3,77	0,001
have an item of tobacco	No	Ref		
product/ cig logos	Yes	1,80	1,34 – 2,41	0,001
seen cig adv/ promotion	No	Ref		
at music concert	Yes	1,72	1,31 – 2,26	0,001
seen cig adv internet/social	No	Ref		
media the past 30 days	Yes	1,30	1,05 – 1,61	0,015

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