

RESEARCH ARTICLE

Effects of Cigarette Smoking across Three Generations and of Perceptions of the Smoking-Cancer Relationship on the Cigarette Smoking Status of Turkish University Students

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Abstract

Background: This descriptive and cross-sectional study aimed to investigate effects of cigarette smoking across three generations and perceptions of the smoking-cancer relationship on the cigarette smoking status of Turkish university students. **Materials and Methods:** The study sample comprised of 434 university students studying in different departments of a university. Data were collected using a socio-demographic data collection form and the Decisional Balance Scale and evaluated using the Mann-Whitney U test, CHAID and multiple regression analyses. **Results:** The average age of the students participating in the study is 19.6±5.0, some 11.3% of the students reporting that they smoked cigarettes. No statistically significant relationship was ascertained between the cigarette smoking statuses of the students based on the cigarette smoking status of their grandparents ($p=0.144$), but there was a link to that of their parents ($p=0.002$). The difference between the cigarette smoking ratios of the students based on their perceptions of smoking-cancer relationship was statistically significant ($p<0.001$). Believing that there is a relationship between smoking and cancer decreased likelihood of cigarette smoking 3.7 fold. Cigarette smoking by grandparents, and believing that there is a relationship between smoking and cancer, and cigarette smoking by parents explained 8.3% of the cigarette smoking status of the students. **Conclusions:** While cigarette smoking by grandparents only indirectly influences cigarette smoking by the students, believing that there is a relationship between smoking and cancer, and cigarette smoking by parents are influential variables in determining cigarette smoking by Turkish students.

Keywords: Parents - grand parents - smoking status - intergenerational transmission - Turkish university students

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Introduction

Smoking is among the most important preventable mortality and morbidity causes that adversely affect human health through his/her life starting from the fertilization period. Smoking was determined to be a risk factor for six out of eight diseases, with cancer being in the first place, that cause deaths the most across the world. 4.9 million people die of tobacco consumption every year, and as long as the existing smoking pattern continues, 10 million people are estimated to die of smoking in 2020, and 70% of these deaths are estimated to take place in the developing countries. Cigarette consumption progressively rises in Turkey as in other developing countries (WHO, 2005; WHS, 2012). While 32% of males and 8% of females older than 15 years of age smoke cigarette across the world, 33.4% of people aged 18 years and over, 47% of males and 15% of females older than 15 years of age smoke cigarette across Turkey. Turkey ranks third in Europe and seventh among the countries in the world in terms of

cigarette consumption (WHS, 2012). Publications indicate that the prevalence of cigarette smoking progressively increases and that cigarette smoking ratios are close to each other across individuals with all educational and socio-cultural characteristics. When examined from educational and socio-cultural viewpoint on the other hand, young adults starting on a university life are seen to be one of the most risky groups in terms of cigarette smoking (WHO, 2007; WHO, 2008; WHS, 2012). While the research indicate that cigarette smoking ratios among the university students vary between 15-74% in Turkey, the cigarette smoking ratios among the university students vary between 3-97% across the world (Boyaci et al., 2003; Telli et al., 2004; Kilic and Ek, 2006; Capik and Ozbicakci, 2007; Picakciefe et al., 2007; Smith, 2007; Tanrikulu et al., 2008; Jayakumary et al., 2010; Turhan et al., 2011). These findings reveal that effective coping efforts are necessary to eliminate the harms of cigarette smoking. The most important aspect of anti-smoking efforts is to determine the factors that affect cigarette smoking initiation and

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continuation. The studies reveal that there are several factors affecting cigarette smoking experimentation and continuation, the two most important of which are cigarette smoking in the family and chronic diseases developed family members due to cigarette smoking. While effects of cigarette smoking by parents on individuals' perceptions of cigarette smoking and cigarette smoking status are widely mentioned in the literature (Boyaci et al., 2003; Telli et al., 2004; Kilic and Ek, 2006; Capik and Ozbicakci, 2007; Picakciefe et al., 2007; Smith, 2007; Tanrikulu et al., 2008; Jayakumary et al., 2010; Turhan et al., 2011), very few studies were seen focusing on cigarette smoking status of grandparents and effects of cigarette smoking status of parents and existence of a family member with cancer on the individual's cigarette smoking status (Kalesan et al., 2006; Brook et al., 2012; Vandewater et al., 2014). The family's stance towards a behavior influences the individuals' perception of that behavior. Therefore, it creates a positive or negative environment to exhibit that behavior in family environment (Bandura, 1989; Bandura, 1998; Ozturk et al., 2010b; Yilmaz et al., 2011). While Bandura (1989) emphasizes that an unstructured and negative environment facilitates development of negative health behaviors by individuals, it is emphasized that cigarette smoking in the family or existence of a family member with a chronic illness such as cancer will create a negative family environment, making it difficult for the family to cope (Ozturk et al., 2011), and that negative coping methods such as cigarette smoking may therefore mostly be displayed by family members (Bandura, 1998). Although it is emphasized in the literature that cigarette smoking in older generations and existence of a chronic illness in the family influence cigarette smoking status, no study was found supporting such arguments. This study aims to investigate effects of cigarette smoking across three generations of their family, and of their perceptions of smoking-cancer relationship on the cigarette smoking status of the university students.

Materials and Methods

Aim

This descriptive and cross-sectional study aims to investigate effects of cigarette smoking across three generations of their family, and of their perceptions of smoking-cancer relationship on the cigarette smoking status of the university students.

Population and sample

The study sampling was comprised of 434 students studying at the Departments of Nursing, Social Services, Psychology, English Language Teaching, Preschool Teaching, Architecture, Political Sciences and International Relations, Business Administration, Computer Engineering, Psychological Counseling and Guidance, Turkish Language Teaching, Food Engineering and Islamic Sciences of a university during the fall semester in 2013-2014 academic year, who voluntarily agreed to participate in the study. After obtaining the approval of the institution to conduct the study, the participants were apprised of the study, and 434 students

who voluntarily agreed to participate in the study were included in the research sampling.

Data collection instruments

Data was collected from the students by the researchers using data collection forms between 1st November and 15th December 2013.

Data was collected using Socio-Demographic data collection form, Parental Attitude Scale and Decisional Balance Scale.

Socio-demographic data collection form; was developed by the researchers and comprised of 19 questions regarding students' age, gender, class attended, parents' educational levels, income levels, grandparents' and parents' cigarette smoking status and cancer-smoking relationship.

Decisional Balance Scale (DBS): The original 24-item DBS was developed by Velicer and colleagues (1985) to evaluate perceptions of individuals of advantages and disadvantages of cigarette smoking. The DBS was reduced to 20 items by Pallonen and colleagues in 1998. The DBS, a Likert type scale with scores ranging from 1 to 5, consists of 10-item advantages and 10-item disadvantages subscales. Validity and reliability of the DBS were performed by Bektas et al (2010a) in Turkey. The Cronbach alpha values of the disadvantages and advantages sub-dimensions of the DBS are respectively .81 and .85. The high mean score of the disadvantages subscale indicates that individual has strong perceptions of the disadvantages of cigarette smoking, and the high mean score of the advantages subscale indicates that individual has strong perceptions of the advantages of cigarette smoking.

Analysis of the data

Data was evaluated using percentage calculations, mean, Mann-Whitney U test, CHAID analysis and multiple regression analysis. The significance level was determined as 0.05.

Results

Age average of the students participating in the study is 19.62+.5. 11.3% of the students smoke cigarette. 35.9% of the students experimented smoking cigarette at least once in their lives. The age average of the students having cigarette smoking experience for the first experimentation of cigarette smoking is 15.5+3.1'dir. Of the students 22.8% are male, and 77.2% are female. 70% of the students stated that their income was equal to their expenses.

While 13.4% of the students who have smoker grandparents smoke cigarette, 8.9% of the students who have non-smoker grandparents smoke cigarette. No statistically significant difference was ascertained between the cigarette smoking statuses of the students based on the cigarette smoking status of their grandparents ($p=0.144$).

8.8% of the students who have non-smoker parents, 10.4% of the students who have one smoker parent, and 27.3% of the students who have two smoker parents smoke cigarette. The difference between the cigarette smoking statuses of the students based on the cigarette smoking

status of their parents is statistically significant ($p=0.002$).

While 7.7% of the students who state that there is a relationship between cancer and smoking smoke cigarette, 29.2% of the students who state that there is no relationship between smoking and cancer smoke cigarette. The difference between the cigarette smoking ratios of the students who state that there is a relationship between smoking and cancer and of the students who state that there is no relationship between smoking and cancer is statistically significant ($p=0.000$). Believing that there is a relationship between smoking and cancer decreases cigarette smoking by 3.7 fold (OR: 3.77, 95%CI: 2.273-6.225).

While the score of the perception of the students of advantage of smoking, who have smoker grandparents is 29.8+9.4, that of the students of advantage of smoking, who have non-smoker grandparents is 28.1+6.4. No significant difference was ascertained between the mean scores of the perception of the students of advantage of

smoking based on the cigarette smoking status of their grandparents ($p=0.702$). While the score of perception of the students of disadvantage of smoking, who have smoker grandparents is 33.9+9.3, that of the students of disadvantage of smoking, who have non-smoker grandparents is 34.0+6.9. No significant difference was ascertained between the mean scores of the perception of the students of disadvantage of smoking based on the cigarette smoking status of their grandparents ($p=0.842$).

The result of the multiple regression analysis indicated that the variables in the study had a significantly low-level interaction with the cigarette smoking status of the students ($R^2=0.083$) ($F=13.005$, $p=0.000$). These variables explain 8.3% of the cigarette smoking status of the students. According to standardized regression coefficient (β), it was ascertained that the effect of the independent variables on the cigarette smoking status was, in order of significance, their perceptions of smoking-cancer relationship, the cigarette smoking status of their parents,

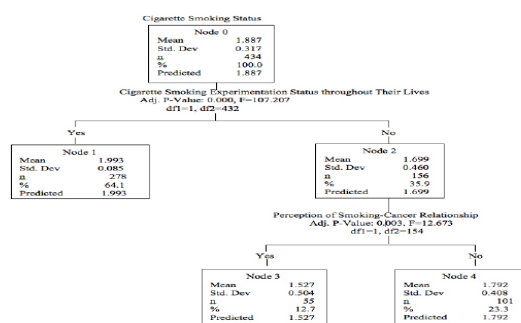


Figure 1. The Result of the CHAID Analysis of the Factors Affecting the Cigarette Smoking Status of the Students

Table 2. Comparison of the Perceptions of the Students of Disadvantages of Smoking Based on the Cigarette Smoking Status of their Grandparents

Cigarette Smoking Status of Their Grandparents	Advantage Perception of the Student		Disadvantage Perception of the Student	
	X	SD***	X	SD
Smoker	29.8	9.4	33.9	9.3
Non-smoker	28.1	6.4	34.0	6.9
U*	181,500		188,000	
p**	0.702		0.842	

*Mann-Whitney U test **indicated p-value was significant at $p<0.05$ *** Standart Deviation

Table 1. Comparison of the Cigarette Smoking Statuses of the Students Based on the Cigarette Smoking Status of their Grandparents, Parents and their Perceptions of Smoking-Cancer Relationship

Cigarette Smoking Status of Their Grandparents	Smoking Status				χ^2	p
	Smoker		Non-smoker			
	n	%	n	%		
Smoker	31	13.4	201	86.6	2.136	0.144
Non-smoker	18	8.9	184	91.1		
Total	49	22.3	385	87.7		
Cigarette Smoking Status of Their Parents					12.736	0.002
None Doesn't smoke	20	8.8	207	91.2		
One parent smokes	17	10.4	146	89.6		
Two parents smoke	12	27.3	32	72.7		
Total	49	11.3	385	88.7		
Between Smoking-Cancer					27.542	0.000
There is a relationship	28	7.7	334	92.3		
There is no relationship	21	29.2	51	70.8		
Total	49	11.3	385	88.7		

Table 3. Variables Affecting the Cigarette Smoking Status of the Students*

	B	Standard Error	Standard Beta (β)	t	p**
Constant	1,629	0,090		18,189	0,000
The Cigarette smoking status of the parent	-0,059	0,023	0,125	2,616	0,009
The Cigarette Smoking Status of the Grandparent	-0,026	0,030	0,041	0,856	0,392
Perception of the Smoking-Cancer Relationship	0,213	0,039	0,251	5,426	0,000

R= 0.288; $R^2=0.083$; $F=13.005$; $p=0.000$; DW*** Coefficient= 1.753 (1.5-2.5)

*Multiple Regression Analysis ** indicated p-value was significant at $p<0.01$ *** Durbin-Watsin Coefficient

and the cigarette smoking status of their grandparents. When the t test results were reviewed, it was seen that only their perception of smoking-cancer relationship ($p=0.0000$) and the cigarette smoking status of their parents ($p=0.009$) had a significant effect on the cigarette smoking status of the students.

It is seen that the perception of the students of smoking-cancer relationship affects their experimentation of cigarette smoking throughout their lives ($F=12.673$, $p=.003$), and that their experimentation of cigarette smoking throughout their lives affects the cigarette smoking status of the students ($F=107.207$, $p=.000$) (Figure 1).

Discussion

This section discusses how the cigarette smoking status of parents and grandparents and the perception of the students of smoking-cancer relationship affect the cigarette smoking status of the students.

In this study, while 13.4% of the students who have smoker grandparents smoke cigarette, 8.9% of the students who have non-smoker grandparents smoke cigarette. It was ascertained that the cigarette smoking status of grandparents did not influence the cigarette smoking status of the students ($p=0.144$, Table 1). When the literature is reviewed, few studies focusing on the influence of the cigarette smoking status of grandparents on the cigarette smoking by children and young people are seen, and these studies conclude that smoking by grandparents smoking has no direct influence on cigarette smoking by children and young people (Kalesan et al., 2006; Brook et al., 2012; Vandewater et al., 2014). Again, Studies emphasize that smoking by grandparents influences smoking by parents, that children whose parents smoke cigarette, on the other hand, smoke cigarette more, and that smoking by grandparents has an indirect influence on smoking by children and young people (Ohido et al., 2001; Kalesan et al., 2006; Bektas et al., 2010b; Al-naggaret et al., 2011; Golbasi et al., 2011; Ozturk et al., 2011; Azhar and Alsayed, 2012; Brook et al., 2012; Ulgen et al., 2012; Al-Naggaret et al., 2013; Jeganathan et al., 2013; Ozturk et al., 2013; Vandewater et al., 2014). The findings of the current study are consistent with the literature. Basically, Bandura (1989) states in his Social Cognitive Theory that the environment is an important factor determining the behaviors. Therefore, while cigarette consumption is expected more in children who grow in a cigarette smoking environment, no difference was ascertained between the cigarette smoking by the students whose grandparents smoked cigarette and the cigarette smoking by the students whose grandparents did not smoke cigarette (Table 1). It was thought that one of the most important reasons for this might be caused by the fact that the family types and traditional family structures changed in societies becoming industrialized, that the grandparents and the grandchildren spent little time, that the family structure turned more into a nuclear family structure, and that the grandparent-grandchild relationship changed in the urban culture.

In this study, 8.8% of the students who have non-smoker parents, 10.4% of the students who have one

smoker parent, and 27.3% of the students who have two smoker parents smoke cigarette. It was ascertained that as the number of smoker parents increased, the young people smoked cigarette more ($p=0.002$, Table 1). When the literature is reviewed, smoking by parent is seen to have a very strong influence on smoking by young people. It is emphasized that existence of a smoker parent in family increases smoking ratio of young people by 5 to 50 fold (Boyaci et al., 2003; Telli et al., 2004; McCann et al., 2005; Kalesan et al., 2006; Kilic and Ek, 2006; Capik and Ozbicakci, 2007; Picakciefe et al., 2007; Smith, 2007; Tanrikulu et al., 2008; Jayakumary et al., 2010; Bektaset al., 2010b; Al-naggaret et al., 2011; Golbasi et al., 2011; Ozturk et al., 2011; Turhan et al., 2011; Azhar and Alsayed, 2012; Brook et al., 2012; Ulgen et al., 2012; Al-Naggaret al., 2013; Jeganathan et al., 2013; Ozturk et al., 2013; Vandewater et al., 2014). The current study's findings also support the literature, and indicate that as the number of smoker parents increase in the family, cigarette smoking ratio of the children increases (Table 1). Bandura (1998) emphasizes that especially individuals taken as role models are important in development of negative health behaviors such as cigarette smoking. Bandura (1989) also claims that the environment influences the behaviors and that the environment is a strong factor to facilitate or prevent behavior development. Especially, cigarette smoking in the family, children seeing their parents, who are the most important people for themselves starting from very early age, while smoking cigarette normalizes cigarette smoking and that such behavior causes children not to perceive cigarette smoking as a negative health behavior (Bandura, 1998) Besides, smoking by both parents creates a suitable environment to experiment and use cigarettes, thus increasing the cigarette smoking ratio. Bandura (1998) advocates that there is a strong relationship between the environment and the individual and that this relationship is influential in developing positive health behaviors. It is believed that smoking by parents and increased number of smoker parents create a suitable environment for cigarette smoking, may cause young people to perceive cigarette smoking as advantageous and facilitate development of cigarette smoking behavior.

In this study, while 7.7% of the students who state that there is a relationship between cancer and smoking smoke cigarette, 29.2% of the students who state that there is no relationship between smoking and cancer smoke cigarette ($p=0.000$, Table 1). Believing that there is a relationship between smoking and cancer decreases cigarette smoking by 3.7 fold (OR: 3.77, 95%CI:2.273-6.225, Table 1). No study was found in the literature directly focusing on how the existence of smoking-cancer relationship influenced cigarette smoking. The studies indirectly referred to it, and ascertained that young people who believed that there was a relationship between cancer and smoking and who lost a relative to causes such as lung cancer smoked cigarette less (Bektas et al., 2010b; Ozturk et al., 2011). Believing that there is a relationship between cancer, and that cigarette smoking results in death leads to negative perceptions of cigarette smoking. Bandura (1998) advocates that especially having a negative perception of a behavior prevents development of that behavior and that our

perceptions influence our behaviors. The lower cigarette smoking ratios of the students who believe that smoking causes cancer and who have a strong perception in this respect is consistent with Bandura's (1998) argument. The current study's findings show consistency with both the literature and Bandura's (1998) theoretical arguments, and the students who believe that there is a relationship between cancer and smoking smoke cigarette less.

The current study indicates that the cigarette smoking status of the grandparents does not influence the perceptions of the students of advantage ($p=0.702$) and disadvantage ($p=0.842$) of cigarette smoking (Table 2). No study was found in the literature focusing on how smoking by grandparents influenced the perceptions of the students of advantage and disadvantage of cigarette smoking. Very few studies ascertained that smoking by grandparents had an indirect influence on smoking by children (Kalesan et al., 2006; Brook et al., 2012; Vandewater et al., 2014). The result that may be deduced from such study conclusions is that smoking by grandparents may influence perceptions of children and young people of advantage and disadvantage of cigarette smoking. Bandura (1998) emphasizes that behaviors exhibited by favored and valued individuals who have higher statuses may be easily repeated by people who particularly take them as role models and favor them. Therefore, smoking by grandparents may cause children or young people who love and take them as example to develop positive perceptions of cigarette smoking. The current study shows that although smoking by grandparents doesn't directly influence the perceptions of the students of advantage and disadvantage of cigarette smoking, there is an increase in cigarette smoking ratios. This result gives rise to the thought that smoking by grandparents may influence the perception of the students of cigarette smoking.

The results of the multiple regression analysis ascertained that the variables in the study had a significantly low-level interaction with the cigarette smoking status of the students, and explained 8.3% of the cigarette smoking status ($R^2=0.083$) ($F=0.000$, $p=5$). It was ascertained that the effects of the independent variables on cigarette smoking status were, in order of significance, their perceptions of smoking-cancer relationship, the cigarette smoking status of their parents, and the cigarette smoking status of their grandparents. It was seen that only their perception of smoking-cancer relationship ($p=0.0000$) and the cigarette smoking status of their parents ($p=0.009$) had a significant influence on the cigarette smoking status of the students (Table 3). When the literature is reviewed, it is seen that especially cigarette smoking status of parents significantly influences cigarette smoking by students, and that parents' being a role model and stance towards cigarette smoking synergically increase cigarette smoking by children and young people (Boyaci et al., 2003; Telli et al., 2004; McCann et al., 2005; Kalesan et al., 2006; Kilic and Ek, 2006; Capik and Ozbicakci, 2007; Picakciefte et al., 2007; Smith, 2007; Tanrikulu et al., 2008; Jayakumary et al., 2010; Bektaset et al., 2010b; Al-naggar et al., 2011; Golbasi et al., 2011; Ozturk et al., 2011; Turhan et al., 2011; Azhar and Alsayed, 2012; Brook et al., 2012; Ulgen et al., 2012; Al-Naggaret al., 2013; Jeganathan et al., 2013;

Ozturk et al., 2013; Vandewater et al., 2014). Also, strong perception of students that "smoking may cause cancer" increases perception of disadvantage of smoking and may prove to be an important variable for preventing cigarette smoking due to decreased perception of advantage (Bektas et al., 2010a). The current study's findings are consistent with the literature, and it is seen that the perceptions of the students of smoking-cancer relationship and the cigarette smoking status of their parents explain 8% of the conditions influencing cigarette smoking by the students. The reason why this regression model explained only 8% of the conditions influencing cigarette smoking was thought to be that, as cigarette smoking could not be associated only with parent or cancer, it might be caused by existence of several factors affecting cigarette smoking such as social-cultural-regional-economic-family factors. In spite of existence of multiple factors the ratio of 8% explained by the model is significantly high (Boyaci et al., 2003; Telli et al., 2004; McCann et al., 2005; Kalesan et al., 2006; Kilic and Ek, 2006; Capik and Ozbicakci, 2007; Picakciefte et al., 2007; Smith, 2007; Tanrikulu et al., 2008; Jayakumary et al., 2010; Bektaset et al., 2010b; Al-naggar et al., 2011; Golbasi et al., 2011; Ozturk et al., 2011; Turhan et al., 2011; Azhar and Alsayed, 2012; Brook et al., 2012; Ulgen et al., 2012; Al-Naggaret al., 2013; Jeganathan et al., 2013; Ozturk et al., 2013; Vandewater et al., 2014). This ratio shows us that if these two factors can be controlled, at least 8 out of 100 children who will smoke in the future will be able to get rid of this addiction. These findings are also important in this respect.

The result of CHAID analysis shows that the perception of the students of smoking-cancer relationship influences their experimentation of cigarette smoking throughout their lives ($p=.003$), and that cigarette smoking experimentation throughout their lives significantly influences the cigarette smoking status of the students ($p=.000$) (Figure 1). When the literature is reviewed, it is seen that perceptions of children and young people of cigarette smoking significantly influence their experimentation of cigarette smoking throughout their lives, and that their experimentation of cigarette smoking significantly influences their cigarette smoking status and their smoking addiction status (Boyaci et al., 2003; Telli et al., 2004; McCann et al., 2005; Kalesan et al., 2006; Kilic and Ek, 2006; Capik and Ozbicakci, 2007; Picakciefte et al., 2007; Smith, 2007; Tanrikulu et al., 2008; Jayakumary et al., 2010; Bektaset et al., 2010b; Al-naggar et al., 2011; Golbasi et al., 2011; Ozturk et al., 2011; Turhan et al., 2011; Azhar and Alsayed, 2012; Brook et al., 2012; Ulgen et al., 2012; Al-Naggaret al., 2013; Jeganathan et al., 2013; Ozturk et al., 2013; Vandewater et al., 2014). while this result proves to be consistent with the literature, it indicates how important it is in prevention of cigarette smoking to believe that there is a relationship between cancer and smoking is to prevent smoking, and that communicating to the children the relationship of cancer and smoking in parallel with their cognitive development period will decrease experimentation of cigarette smoking by children and young people, thus decreasing their cigarette smoking status and addiction status.

The current study has few limitations. The most

important limitation herein is that no clear information could be attained on grandparent-grandchild interaction, which it is believed may influence intergenerational transfer of cigarette smoking. The force of such interaction may influence cigarette smoking and experimentation status (Waldrop and Weber, 2005; Edwards, 2006). Another important limitation is that although the cigarette smoking ratio in Turkey is 26%, the smoking ratio of the study sampling is 11%, which is lower than the smoking ratio of the overall population. It was thought that such low ratio might affect the study results. Therefore, it is recommended that the study be repeated so as to include these factors with a larger sampling. The biggest strength of the study is that it investigated how cigarette smoking behavior was transferred across not only two, but three generations.

In conclusion, the perceptions of the students of cancer-smoking relation influence their cigarette smoking status and their perceptions of advantage/disadvantage of cigarette smoking. Although cigarette smoking status of grandparents does not statistically influence the cigarette smoking status of the students, more students were identified to smoke cigarette. Therefore, it may be said that smoking by grandparents indirectly influences the cigarette smoking by the students. Students whose parents smoke significantly smoke cigarette more. These results indicate that cigarette smoking may be influenced by environmental factors. It is recommended that experimental studies be conducted to investigate how both three generations and environmental factors influence cigarette smoking by the students.

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