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Prevalence and related risk factors of tobacco, alcohol and illicit substance use among university students

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ABSTRACT – Background and Objectives: The objective of this study was to determine the frequency of cigarette, alcohol and substance use and the possible associations between different types of substance use and various risk factors among university students.

Methods: A self-assessment questionnaire was administered to 4762 students from Canakkale Onsekiz Mart University. The risk factors associated with cigarette, alcohol and substance use were investigated with logistic regression analysis.

Results: The frequencies of regular or occasional tobacco and alcohol use were 38.6% and 46.3% respectively. The frequency of using substance at least once in life time was 6.3% among students. In the present study, male gender was found to be a statistically significant risk factor associated with all of the three dependent variables. The statistically significant risk factors for using alcohol were studying in college and vocational schools, having a parent with high school and above educational level, having a family income of 1226 USD's and above, having tried tobacco once or a couple of times and using tobacco occasionally or regularly, and having used another substance at least once. Substance use risk was found to be higher in those with higher depression scores, in those who tried tobacco once or a couple of times and who were not using regularly, and who were using tobacco or alcohol occasionally or regularly.

Conclusions: The practices and activities of the health center incorporated in the university should be enhanced for the establishment of effective control programs related to tobacco, regular alcohol and substance use.

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Introduction

According to the estimates of World Health Organization, 2 billion people use alcohol, 1,3 billion people smoke cigarettes, and 185 million use drugs worldwide. Each year 5,4 million deaths occur due to cigarette smoking and health problems caused by alcohol use are seen in 76,3 million people¹⁻³.

Of the 430,459 deaths seen in Turkey in 2010, it is predicted that 54,699 could have been prevented by preventing cigarette smoking and 13,435 could have been prevented by preventing alcohol use⁴. Unfortunately we don't have enough information about the national dimensions of the health burden of substance and drug usage.

In a study carried out in a group of young subjects aged between 15-24 years in Turkey, it was determined that 28.5% have smoked cigarettes at least once and 34.7% used alcohol at least once⁵.

In the study conducted by Ogel *et al.* among high school students from 15 different cities, it was found that 22% of the students smoked cigarettes daily, 17.3% consumed alcohol at least once in the last month, 3.6% used cannabis at least once and 8.6% used inhalants at least once⁶.

Tobacco, alcohol and substance use generally begins during adolescence³. The importance of these habits lies in the increased

risk for the university students to encounter the substances and the burden of disease potential they cause later in the life. The aim of this study was to determine the frequency of tobacco, alcohol and illicit substance use and the interrelations between the usage of various substances.

Methods

Study Population and Sample

The study was conducted during 2007-2008 academic year in 9 faculties (consisting of 4 years of university education), 6 colleges and 7 vocational schools (consisting of 2 years of university education) from different campuses of Canakkale Onsekiz Mart University (COMU), located in various regions of the city. In Turkey university education comprises of faculties involving 4 years of education, and colleges and vocational schools with a shorter (2 years) education which aim to educate students in a short span of time to help them for getting a profession. The university is located in Canakkale which is a small city in the northwest part of Turkey. During the mentioned period a total of 19,988 students were having education in the license and college programs of the university. Females comprised 51.4% (10,277) and males comprised 48.6% (9,711) of the students.

The minimum sample size for the study was designated as 5,034. A total of 4,762 students (94.6%) were reached. In determining the distribution of the sample, stratified sampling technique was used. In line with this purpose, stratification was carried out with respect to the weights of the faculties and the colleges. School of medicine students except for the first grade were excluded from the stratification, since they were continuing their courses in another university.

Type of the Study

The present study is a cross-sectional type of epidemiological study in which the frequencies of more than one health problem were investigated. Among the aims of the study, the incidence of headache, the frequency of having an accident and the assessment of mental state parameters consisting of depression, anxiety, anger and modes of anger expression were also included. In this article the results for the tobacco, alcohol and illicit substance use of the students were presented.

Procedure and Measures of Data Collection

This study was a collaborative research conducted by three different researchers (faculty members from the neurology, psychiatry and public health departments). Written permission of the presidency of the university was obtained prior to the procedure. Subsequently the faculty and college administrators were contacted to request their support during the data collection step. On dates determined together with the school administrations, surveys were administered to the students in a group setting during a scheduled school day.

The objectives of the study were explained to the students and they were informed about

their right to refuse without any negative consequences. Participation in the study was totally voluntary and the questionnaire forms were anonymous. Written informed consents were obtained from the participants. Local research ethical committee approval was not obtained since local ethical committee was not founded at the time the study was conducted.

The questionnaire form used in the study comprised of four parts. In the first part there were questions about the descriptive characteristics of the respondents and the use of tobacco, alcohol and other substances. The second part consisted of questions about headache, the third part consisted of questions about having accidents in the past year, and the fourth part consisted of scales concerning mental state i.e. The Beck Depression Inventory(BDI), the Beck Anxiety Inventory(BAI), and the State-Trait Anger Inventory (STAI).

The pilot application of the questionnaire form was carried out on 30 students from the first grade of the school of medicine. Following the pilot study, the questionnaire form was revised to form the final version. In the revised version of the questionnaire some questions were changed to be more clear and some questions were omitted, since the authors observed that they were frequently skipped or misunderstood by the respondents. The majority of the revisions were consisting of the items related to headache which were not used in this study.

For the questions inquiring the tobacco, alcohol, and substance use, National Burden of Disease and Cost Effectiveness Project Household Survey carried out by the Ministry of Health was used⁷.

The questions inquiring the cigarette smoking, alcohol and illicit substance use were closed-ended and the responses were as follows: "No, I never used", "I tried once, I'm not using currently", "I used a few times,

I'm not using currently", "I use occasionally", "I use regularly".

These options were reorganized during the analysis in order to perform the logistic regression analysis. In the cigarette and alcohol questions, "No, I never used" response was coded as "Never used (0)"; I tried once, I'm not using currently" and "I used a few times, I'm not using currently" responses were coded as "Tried once or a couple of times, not using currently (1)"; and "I use occasionally" and "I use regularly" responses were coded as "Using occasionally or regularly (2)". For substance use "No, I never used" response was coded as "Never used (0)" and the other responses were coded as "Used at least once (1)".

Beck Depression Inventory (BDI): BDI was first developed by Beck *et al.* (1961) and with its 1978 version^{7,8} it was adapted to obtain a self-report scale easier for scoring. It consists of 21 items rated 0 to 3, with a maximum score of 63 and a cut-off score of 17. Turkish adaptation of the scale was made by Tegin (1980) and Hisli (1988, 1989)⁹⁻¹¹. The Turkish version of the BDI is widely used for healthy and clinical populations. In the psychometric properties of the Turkish version, it is mentioned that the scale can be used in clinical and healthy populations.

Statistical Analysis

The collected data were entered in the Epi-Info version 6 statistical program by the researchers. After being checked, the data was later transferred to the SPSS 15.0 statistical program to be analyzed. The risk factors affecting cigarette, alcohol and substance use were investigated by logistic regression analysis. In the logistic regression analysis, gender, school, education of the mother and the father, income status, and BDI score were

taken as the independent variables for the cigarette, alcohol and illicit substance use. For each substance, other substance usages were also taken as risk factors. Statistical significance was set at $p < 0.05$.

Results

In this study 4762 students were investigated of which 53.1% were female, 52.6% were faculty (university licensing programs involving 4 years of education) students and 47.4% were college (university licensing programs involving 2 years of education) students. Mean age of the students was 20.4 ± 2.1 . Regarding the mothers and the fathers of the students, 78.6% and 61.9% respectively had an education level of primary school or less. The income of the families was 1225 USD (monthly) and below in 76.7% of the subjects. Average BDI score was estimated to be 11.7 ± 8.1 and 24.6% had a BDI score of 17 and above (Table 1). Of the respondents, 42.6% were staying in the dormitory and 57.4% were staying at home with friends or with their families. Of the investigated students, 34.9% have never smoked in their life while 24.8% smoked regularly everyday. Regarding alcohol, those who had never drunk alcohol constituted 33.8% of the study population, while 37.9% drank alcohol occasionally, and 8.1% drank alcohol regularly. Of the students 93.7% had never used an illicit substance in their life, 2.9% tried an illicit substance once but were not using currently, 1.2% were using occasionally and 0.1% were using regularly.

Cigarette smoking risk was 1.3 times higher in males (95%CI:1.1-1.5), 1.2 times higher in college and vocational school students (95%CI:1.1-1.4), 1.3 times higher in those with a family income of 1226 USD and

Table 1
Cigarette smoking, alcohol and substance use of the students in terms of the descriptive characteristics, 2008, Çanakkale

	Cigarette smoking				Alcohol drinking				Substance* use	
	Total	Never used	Tried once or a couple of times, not using regularly	Using occasionally or regularly	Never used	Tried once or a couple of times, not using regularly	Using occasionally or regularly	Never used	Tried once or a couple of times, not using regularly	Using occasionally or regularly
Academic Programs	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Faculties	2505(52.6)	984(39.3)	719(28.7)	802(32.0)	966(38.6)	499(19.9)	1040(41.5)	2371(94.7)	114(4.6)	20(0.8)
College-Vocational School	2257(47.4)	677(30.0)	547(24.2)	1033(45.8)	642(28.4)	463(20.5)	1152(51.0)	2091(92.6)	123(5.4)	43(1.9)
p**		0,0001			0,0001			0,0001		0,01
Gender										
Female	2531(53.1)	1029(40.7)	726(28.7)	776(30.7)	1020(40.3)	594(23.5)	917(36.2)	2473(97.7)	47(1.9)	11(0.4)
Male	2231(46.9)	632(28.3)	540(24.2)	1059(47.5)	588(26.4)	368(16.5)	1275(57.1)	1989(89.2)	190(8.5)	52(2.3)
p**			0,0001			0,0001		0,0001		0,0001
Education of the Mother										
Primary school and under	3744(78.6)	1349(36.0)	1018(27.2)	1377(36.8)	1406(37.6)	796(21.3)	1542(41.2)	3539(94.5)	166(4.4)	39(1.0)
High school and above	1018(21.4)	312(30.6)	248(24.4)	458(45.0)	202(19.8)	166(16.3)	650(63.9)	923(90.7)	71(7.0)	24(2.4)
p**			0,0001			0,0001		0,0001		0,0001
Education of the Father										
Primary school and under	2948(61.9)	1056(35.8)	798(27.1)	1094(37.1)	1107(37.6)	636(21.6)	1205(40.9)	2787(94.5)	132(4.5)	29(1.0)
High school and above	1814(38.1)	605(33.4)	468(25.8)	741(40.8)	501(27.6)	326(18.0)	987(54.4)	1675(92.3)	105(5.8)	34(1.9)
p**			0,04			0,0001		0,0001		0,004

* Stimulants, inhalants and/or other illicit substances. **Chi-Square test. ***40 students did not respond to this question. **** 283 students' BDI responds were incomplete. USD: United States Dollar.

Table 1
Cigarette smoking, alcohol and substance use of the students in terms of the descriptive characteristics, 2008, Çanakkale (continuation)

	Cigarette smoking				Alcohol drinking				Substance* use		
	Total	Never used	Tried once or a couple of times, not using regularly	Using occasionally or regularly	Never used	Tried once or a couple of times, not using regularly	Using occasionally or regularly	Never used	Tried once or a couple of times, not using regularly	Using occasionally or regularly	n (%)
Family Income***	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
1225 USD and under	3624(76.7)	1349(37.2)	975(26.9)	1300(35.9)	1361(37.6)	765(21.1)	1498(41.3)	3425(94.5)	162(4.5)	37(1.0)	
1226 USD and above	1098(23.3)	299(27.2)	275(25.0)	524(47.7)	230(20.9)	189(17.2)	679(61.8)	997(90.8)	75(6.8)	26(2.4)	
Total	4722(100.0)	1648(34.9)	1250(26.5)	1824(38.6)	1591(33.7)	954(20.2)	2177(46.1)	4422(93.7)	237(5.0)	63(1.3)	
p**			0,0001			0,0001			0,0001		
BDE Score****											
16 and under	3376(75.4)	1261(37.4)	928(27.5)	1187(35.2)	1190(35.2)	661(19.6)	1525(45.2)	3203(94.9)	131(3.9)	42(1.2)	
17 and above	1103(24.6)	298(27.0)	264(23.9)	541(49.0)	311(28.2)	241(21.8)	551(50.0)	991(89.8)	95(8.6)	17(1.5)	
Total	4479(100.0)	1559(34.8)	1192(26.6)	1728(38.6)	1501(33.5)	902(20.1)	2076(46.3)	4194(93.7)	226(5.0)	59(1.3)	
p**			0,0001			0,0001			0,0001		

* Stimulants, inhalants and/or other illicit substances. **Chi-Square test. ***40 students did not respond to this question. ****283 students' BDI responds were incomplete. USD:United States Dollar.

above (95%CI:1.1-1.5), 1.5 times higher in those with a BDI score of 17 and above (95% CI:1.3-1.7), 3.6 times higher in those who have drunk alcohol at least once (95%CI:3.0-4.3), and 5.9 times higher in those who drank alcohol occasionally or regularly (95%CI: 5.0-6.9) (Table 2).

Alcohol use was 1.5 times more likely in males (95%CI:1.3-1.7), 1.4 times more likely in the students of college and vocational high schools (95%CI:1.2-1.6), 2.0 times more likely in the students with mother's educational level of high school and above (95%CI:1.6-2.5) and 1.2 times more likely in those with father's educational level of high school and above (95%CI:1.1-1.5), 1.7 times more likely in those with a familial income of 1226 USD and above (95%CI:1.4-2.1), 2.7 times more likely in those who have smoked at least once (95%CI:2.3-3.2), 9.8 times more likely in those who smoke occasionally or regularly (95%CI:8.1-11.9) and 2.7 times more likely in those who have used an illicit substance at least once (95%CI:1.5-3.9) (Table 2).

Illicit substance use risk was 4.2 times higher in males (95%CI:3.0-5.7); 2.1 times higher in those with a BDI score of 17 and above (95%CI:1.6-2.7); 3.0 times higher in those who tried smoking at least once (95% CI:1.6-5.4); 7.2 times higher in those who smoked occasionally or regularly (95% CI:4.2-12.3); and 2.9 times higher in those who drank alcohol occasionally or regularly (Table 2).

Discussion

The results of numerous studies indicate that cigarette smoking and alcohol and illicit substance use is a global public health problem¹²⁻¹⁸. Cigarette smoking and regular al-

cohol use appear as a social determinant which has the potential to cause early death of millions of people every year. Regarding the global burden of disease of various substance usages, the risk posed by illicit substance use, although less than the risks of cigarette smoking and alcohol use, has a potential that cannot be neglected¹⁹. Young adults have a remarkable place in this problem since harmful substance use habits generally initiate in this age period.

The results will be discussed over two main topics in this article. First is the prevalence of the cigarette smoking, alcohol and illicit substance use, and the second topic concerns the distribution of the risk factors.

In this study the incidence of ever cigarette smoking was found to be 65.1%. Regular smoking was reported by 24.8% of the students. In the studies carried out in the world and in Turkey, it was observed that the incidence of the use of tobacco products is substantial. According to the results of "National Survey on Drug Use and Health (NSDUH)", the frequency of the use of tobacco products is 41.4% in 2008, and 41.6% in 2009 among the 18-25 years old age group^{12,13}. In a study conducted in Hong Kong including university students, it was found that 13% of the students were smoking cigarettes²⁰. In Yang *et al.* study conducted in Taiwan, consisting of 16-18 year-olds from vocational schools, cigarette smoking in the past year was reported as 56%²¹. According to the results of The Global Adult Tobacco Survey results published by Turkish Statistical Institute in 2008, current prevalence of the use of tobacco products in the 15-24 years old age group was 25.3%¹⁸. In the study involving university students carried out in Kars, Turkey, the incidence of ever smokers was found as 57.5%; in the study conducted in Eskişehir, Turkey, the frequency of regular cigarette smoking was reported as 42.5% among university stu-

Table 2
Cigarette smoking, alcohol and substance use of the students in terms of the descriptive characteristics, 2008, Çanakkale

Gender	Cigarette			Alcohol			Substance*		
	Beta	OR(95%CI)	p	Beta	OR(95%CI)	p	Beta	OR(95%CI)	p
Male	0.233	1.3(1.1-1.5)	0.0001	0.374	1.5(1.3-1.7)	0.0001	1.424	4.2(3.0-5.7)	0.0001
Female		1.0			1.0			1.0	
School									
College-Vocational School	0.223	1.2(1.1-1.4)	0.002	0.326	1.4(1.2-1.6)	0.0001	0.045	1.0(0.8-5.7)	0.734
Faculty		1.0			1.0			1.0	
Education of the Mother									
High school and above	-0.115	0.9(0.7-1.1)	0.250	0.701	2.0(1.6-2.5)	0.0001	0.242	1.3(0.9-1.8)	0.149
Primary school and under		1.0			1.0			1.0	
Education of the Father									
High school and above	-0.072	0.9(0.8-1.1)	0.381	0.213	1.2(1.1-1.5)	0.01	0.107	1.1(0.8-1.5)	0.477
Primary school and under		1.0			1.0			1.0	
Family Income**									
1226 USD and above	0.250	1.3(1.1-1.5)	0.005	0.532	1.7(1.4-2.1)	0.0001	0.258	1.3(0.9-1.7)	0.080
1225 USD and under		1.0			1.0			1.0	
BDI Score***									
17 Points and above	0.391	1.5(1.3-1.7)	0.0001	0.149	1.2(1.0-1.4)	0.090	0.734	2.1(1.6-2.7)	0.0001
16 Points and under		1.0			1.0			1.0	

OR: Odds Ratio. CI: Confidence Interval. BDI: Beck Depression Inventory. USD: United States Dollar.

* Stimulants, inhalants and other illicit substances.

** 40 students did not respond to income question.

*** 283 students' BDI responses were incomplete.

Table 2
Cigarette smoking, alcohol and substance use of the students in terms of the descriptive characteristics, 2008, Çanakkale (continuation)

	Cigarette			Alcohol			Substance*		
	Beta	OR(95%CI)	p	Beta	OR(95%CI)	p	Beta	OR(95%CI)	p
Cigarette									
Tried once or a couple of times, not using regularly	-	-	-	0.988	2.7(2.3-3.2)	0.0001	1.091	3.0(1.6-5.4)	0.0001
Using occasionally or regularly	-	-	-	2.284	9.8(8.1-11.9)	0.0001	1.972	7.2(4.2-12.3)	0.0001
Never used	-	-	-	-	1.0	-	-	1.0	-
Alcohol									
Tried once or a couple of times, not using regularly	1.277	3.6(3.0-4.3)	0.0001	-	-	-	0.352	1.4(0.8-2.5)	0.234
Using occasionally or regularly	1.770	5.9(5.0-6.9)	0.0001	-	-	-	1.078	2.9(1.8-4.8)	0.0001
Never used	-	1.0	-	-	-	-	-	1.0	-
Substance*									
Used at least once	1.665	5.3(3.1-8.9)	0.0001	0.883	2.7(1.5-3.9)	0.0001	-	-	-
Never used	-	1.0	-	-	1.0	-	-	-	-
Constant:		-0.724			-0.977			-6.231	

OR: Odds Ratio. CI:Confidence Interval. BDI:Beck Depression Inventory. USD:United States Dollar.

* Stimulants, inhalants and other illicit substances.

** 40 students did not respond to income question.

*** 283 students' BDI responds were incomplete.

dents^{17,22}. In Orak *et al.* study conducted in Isparta, 48.8% of the students were smoking cigarettes²³. In another study conducted by Turkish Statistical Institute consisting of 261 schools in 60 cities, cigarette smoking prevalence was reported as 15.6%²⁴. In the study consisting of 5,823 students carried out in Istanbul among 15-17 years old adolescents, the prevalence of smoking at least once daily was determined as 19.6%²⁵. The results of the studies from Turkey and the results of our study indicate that the prevalence of cigarette smoking during university period is rather high. Although the results of our study do not provide further evidence about the causes of this condition, prior literature reveals that the higher degree of freedom and the need to adapt to the new social milieu in the campus and the related problems that the university student experiences may form a predisposition for smoking²². Therefore these risks should be taken into account in the organization of counseling services targeting the new students who enter the university life. Trained peer groups may be utilized to help the university student in adapting to the environment and to prevent taking support from smoking while trying to solve his/her problems.

One of the results of this study is about alcohol use. Of the studied group, 37.9% of the university students consume alcohol occasionally and 8.1% consume alcohol regularly. According to the results of NSDUH, among college students in the United States current alcohol use prevalence was reported to be 61.0% in 2008 and 63.9% in 2009. In the same study, the prevalence of heavy drinking among college students was found to be 16.3% in 2008 and 16.0% in 2009^{12,13}. In Yang *et al.* study conducted in Taiwan, alcohol use prevalence was found as 70.7% in vocational schools²¹. Among high school students in Thailand, life-time alcohol use prevalence was found as 30.5% in males and

18.2% in females²⁶. In a study conducted in Hong Kong including university students, it was estimated that 61% of the students were using alcohol²⁰. In the studies concerning the university students, it was reported that the prevalence of ever use of alcohol was approximately 60%^{27,28}. In Orak *et al.* study involving university students, it was indicated that 15% of the students were using alcohol²³. In TSI's (Turkish Statistical Institute) study among students in 60 cities, it was reported that the prevalence of alcohol use in the past month was 16.5%²⁴. The results of this study and prior literature from all over the world show that a substantial portion of the university students encounter alcohol use. Although the available data indicate that a relatively small portion of the students consume alcohol regularly, it is thought that informing the young adults about the risks of alcohol consumption is necessary, regarding the disease burden potential it may result in. In this study it was found that 6.3% of the students abused stimulants, inhalants (such as volatile solvents, aerosols, or gases) and/or other illicit drugs at least once in life-time. For instance in a study conducted in USA among the 18-25 years old age group, it was observed that the prevalence of illicit substance use was 21.2%^{12,13}. In another study involving Chinese university students in Hong Kong, life-time use of marijuana prevalence was reported as 2%, and that of other substances was 2%²⁰. In the study conducted in Taiwan it was seen that the prevalence of substance use among 16-18 years old students was 6.4%²¹. Tot *et al.* study carried out in Mersin, Turkey revealed that 4.7% of the students use cannabis, 5.0% use inhalants and 3.9% use other substances²⁸. In Ihan *et al.* study including university students it was seen that the prevalence of substance use was 6.4% and cannabis use was 5.9%²⁹. The results of our study and the results of prior studies indicate the prevalence of the use of sub-

stances at least once in life-time. In order to reach further conclusions more detailed data are needed. However, regarding the fact that these substances have a high addiction potential and that they are illegal, we think that being exposed to these substances even once still creates an important risk that should not be neglected. Since the present study aimed to determine the presence and the dimensions of the problem in Canakkale Onsekiz Mart University, we do not have detailed information about the use of different substances, but further studies are planned regarding these issues and their data will be shared later. For this step the major point which forewarned us as the researchers was the fact that the probability for the exposure of the students to the risk of substance use was not negligible. Another major point to be considered is that there may be an underestimation of the prevalence of substance use, because it is illegal in Turkey. It is widely known that many subjects hesitate to report the use of illicit substances even in anonymous surveys.

This study reveals that new groups entering the university should be monitored closely by health care units. For this purpose university health centers should be organized to include various personnel from different disciplines, primarily being physicians, psychologists, social workers and psychological counselors.

There exists a Health Center and an affiliated "Youth Counseling Unit" in Terzioğlu campus which is the central campus of COMU. This unit involves a physician, a psychologist and psychological counselors, however regarding the substantial amount of students and the distribution of the schools within the city, it is planned to be fortified.

Another finding of this study concerns the risk factors for cigarette smoking and the use of alcohol and other substances. Male gender,

being a student in college or vocational school, having a family income of 1226 USD monthly and above, the presence of depression, and the use of alcohol and substance increase the risk of cigarette smoking. Regarding the alcohol consumption, being male, being a student in college or vocational school, having a mother or a father with an educational level of high school and above, having a familial income of 1226 USD monthly and above, and cigarette smoking and substance use were determined as the risk factors. For substance use, male gender, the presence of depressive symptoms, and the use of cigarette smoking and alcohol use were observed as the risk factors. Several studies in the literature indicated that the use of tobacco, alcohol and substance is higher in males^{17,18,21,27-30}. Actually this finding was expected. Males are exposed to harmful habits more than females worldwide. Especially in the conservative societies in which women are more strictly controlled than men, it is harder for women to reach cigarettes, alcohol and other substances and the use of these substances by women is generally culturally disapproved. Therefore it should be kept in mind that males are under a higher risk for harmful substances. The results of this study showed that higher familial income of the student increases the risk for cigarette smoking and alcohol consumption. Tot *et al.* study also showed that cigarette smoking and alcohol consumption were higher in the higher income group²⁸. Since it is thought that high family income might have a facilitating effect in reaching the harmful substances, this finding appears to be an expected result. However income was expected to cause a more profound effect on illicit substance use and the fact that this finding was not determined in our study may be due to the limited number of subjects who reported to use illicit substances.

Another important risk factor for cigarette smoking and substance use is the presence of

depression (BDI score being 17 and above). It has been previously demonstrated that subjects with depressive symptoms are characterized by more anti-health life styles including smoking³¹. In Groth and Beedy's study³² consisting of girls ranged in age from 15 to 19, those who smoked either cigarettes or cannabis had higher scores of depression and alcohol use. In Yang *et al.* study, those who have behavioral and mental problems were reported to have a higher risk for cigarette smoking, alcohol and substance use²¹. In line with these findings in the literature, our study also demonstrated that cigarette smoking and substance use were higher in young individuals who have a Beck depression score of 17 and above.

As an expected finding psychological stress increases the use of harmful substances. In this study we don't have the necessary information to discuss the causes of this condition, but the important point that should be taken into account is that young adults who experience psychological stress are at higher risk for using harmful substances. These students should be given priority in the psychological counseling services presented in the health centers as the risk groups. Scales developed to evaluate depression and anxiety may be used to determine the students with high risk either at the beginning of the academic year or at regular intervals during the year.

One last major point we want to emphasize in this article is the association between cigarette smoking, and alcohol and substance use. As the results of our study reveal, using one of these three substances is a risk factor for the use of others. This is an important result and makes us think that cigarette, alcohol and other substances tend to be consumed together. A similar result was also observed in Abdullah *et al.* study. In this study cigarette smoking increased alcohol use risk, marijuana increased cigarette smoking and alcohol use risk²⁰.

Although it was not investigated in this study, due to the easy availability and the higher acceptance in the society for tobacco, it is thought that it may be the first substance to begin. In addition, regarding the fact that cigarette smoking is a risk factor for using other substances, we think that it must be given a priority in the prevention of substance use. Another finding that supports this opinion is the higher prevalence of cigarette smoking than the use of other substances. Important legal revisions concerning cigarette smoking were accomplished in our country recently. However these revisions are not considered to be adequate. Despite the health risks, quitting a habit like smoking is generally harder than it is expected. Thus primary preventive measures targeting individuals who have not started smoking become even more important. Psychological counseling services may contribute to the prevention of harmful habits in the students especially during the first year of the university. In addition to this, planning peer counseling programs targeting university students may be useful in order to help the students who have knowledge deficiency about cigarette smoking, alcohol and substance use, and the students who currently use these substances, but who want to quit.

Several studies in the literature emphasize the importance of peer influence in the use of these substances especially for the first use. Peer counseling programs may be helpful to benefit from the peer influence in a positive way. Regarding the above mentioned points, a prevention program focusing on cigarette smoking and alcohol and substance use has been initiated in Canakkale Onsekiz Mart University in 2010. The efficacy of the 18 months program will be evaluated and in the case of positive results, the peer counseling program aiming to reduce the use of harmful substances will be extended to include all sections of the university.

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