

# PREVALENCE AND FACTORS AFFECTING THE USE OF TOBACCO, ALCOHOL AND ADDICTIVE SUBSTANCE AMONG UNIVERSITY STUDENTS IN EASTERN TURKEY

S Erhan Deveci<sup>1</sup>, Yasemin Açık<sup>1</sup>, A Ferdane Oğuzöncül<sup>1</sup> and Figen Deveci<sup>2</sup>

<sup>1</sup>Department of Public Health, <sup>2</sup>Department of Chest Diseases, Faculty of Medicine, Firat University, Elazig, Turkey

**Abstract.** This study investigated the prevalence and factors affecting the use of cigarettes, alcohol and addictive substances among university students in Eastern Turkey. This cross-sectional study was conducted on 2,258 students at Firat University in the city of Elazig, eastern Turkey. The subjects were students, randomly selected from each department of the university. A questionnaire was administered to the students under direct observation. The mean age of the participants was  $21.36 \pm 2.93$  years. Twenty-nine point three percent of the students smoked and 26.9% used alcohol. Six point six percent declared they had used an addictive substance other than cigarettes or alcohol at least once during their lifetime. Students who smoked had a higher monthly family income and allowance than non-smokers ( $p < 0.05$ ). Smoking was more prevalent among students whose fathers, siblings or close friends also smoked ( $p < 0.05$ ). The use of alcohol was higher among students whose close friends used alcohol ( $p < 0.05$ ). Six point three percent of participants stated they knew classmates who used addictive substances other than cigarettes or alcohol, and 12.4% declared they knew friends outside the classroom who used addictive drugs. At Firat University a large proportion of students reported using alcohol or smoking. Access to addictive drugs was also prevalent. Educational programs oriented towards young people must be prioritized in order to raise awareness regarding substance use.

**Key words:** smoking, alcohol, addictive drugs, university students, Turkey

## INTRODUCTION

The use of tobacco, alcohol and other addictive drugs among university students is major public health concern. Tobacco and alcohol are the most common addictive substances used by young people, and alcohol consumption is increasing in this population (Webb *et al*,

1997; Weinberg *et al*, 1998). Previous studies have reported the use of tobacco and alcohol during this transitional period may lead to experimentation with other addictive substances, such as heroin, hashish and narcotics (Chen and Kandel, 1995; Webb *et al*, 1997).

University students may be at high risk for using illicit substances during university life due to changes in lifestyle and reduced parental support (Ilhan *et al*, 2009). Increased social contact with peers within their campus community may influence the initiation of substance use. The

---

Correspondence: Dr Figen Deveci, Department of Chest Disease, Faculty of Medicine, Firat University, 23119 Elazig, Turkey.  
Tel: +90 424 2333555, 2858  
E-mail: fgndeveci@yahoo.com

move to a university environment is characterized by considerable peer influence and some students may be intellectually, emotionally and socially vulnerable throughout their college years (Karam *et al*, 2007).

Within Turkish society, the relationship between student and family and the influence of family on children generally continues after separation from the family. This sociocultural framework and negative perception of substance use in Turkey may play a preventative role against substance use (Ilhan *et al*, 2009). A recent study found the lifetime prevalence of substance use within five Turkish cities was 6.4%, indicating substance-use has not reached levels reported for Europe (Ilhan *et al*, 2009).

Data on the prevalence of substance use in Turkey are limited. The present study therefore examined the prevalence and determining factors for substance use among college students in Elazig, eastern Turkey.

## MATERIALS AND METHODS

This study used a cross-sectional methodology and interviewed 2,258 students at Firat University, Elazig in eastern Turkey.

The study population comprised 16,098 Firat University students. Given this population size, it was determined a sample group of 2,372 individuals would give a 99% confidence level and a standard deviation of 0.2. Of this sample group, the study successfully surveyed 2,258 participants (Response rate: 95.2%). The study sample group consisted of students from each department of the university. Each department was represented in proportion to the number of students within that department. The questionnaire was given to

students under direct observation. Those students who did not take the questionnaire either did not attend school on the day the questionnaire was administered or chose not to respond.

The questionnaire consisted of questions regarding basic demographic data (age, sex, marital status, living arrangements during education, parental education, and economic status). Substance use was assessed by frequency and substance type. Current (at least once per week) use of cigarettes, current (occasionally or more often) use of alcohol and the use of other addictive substances (heroin, cocaine, morphine, inhalants, hashish) at least once in their lifetimes were evaluated. The questionnaire also included questions about contributory factors related to substance use. The survey was conducted during March - April 2008 and prior consent for the study was obtained from the university presidency.

Data were analyzed using SPSS (Version 10.0). Results are expressed as means  $\pm$  standard deviation (SD). A *p*-value  $<0.05$  was considered significant. Statistical analysis was performed using chi-square and *t*-tests.

## RESULTS

The mean age of participants was  $21.36 \pm 2.93$  years. Seventy point three percent ( $n=1,587$ ) of the students were male and 29.7% ( $n=671$ ) were female. Ninety-seven point seven percent ( $n=2,206$ ) of participants were un-married; 2.0% ( $n=46$ ) were married and 0.3% ( $n=6$ ) were widowed or divorced. The average monthly income of the student's families was  $912.41 \pm 536.69$  Turkish liras (TL), and the average monthly allowance given to the students was  $221.95 \pm 139.23$ .

The proportion of current smokers was

Table 1  
Distribution of use of cigarettes, alcohol and substances by gender.

Substances	Male		Female		Total		p-value
	n	%	n	%	n	%	
Cigarettes							
Smokers	533	33.6	129	19.2	662	29.3	0.0001
Non-smokers	1,054	66.4	542	80.8	1,596	70.7	
Total	1,587	100.0	671	100.0	2,258	100.0	
Alcohol							
Users	479	30.2	128	19.1	607	26.9	0.0001
Non-users	1,108	69.8	543	80.9	1,651	73.1	
Total	1,587	100.0	671	100.0	2,258	100.0	
Other							
Users	130	8.2	20	3.0	150	6.6	0.0001
Non-users	1,457	91.8	651	97.0	2,108	93.4	
Total	1,587	100.0	671	100.0	2,258	100.0	

29.3% ( $n=662$ ), and 26.9% ( $n=607$ ) currently used alcohol. Six point six percent ( $n=150$ ) of the students had used a substance other than cigarettes or alcohol at least once in their lifetime. The mean age of initial use of cigarettes was  $16.05 \pm 2.90$  years.

The use of cigarettes, alcohol and other addictive substances was significantly higher among males than females (Table 1). The distribution of the use of cigarettes, alcohol and substances according to gender is given in Table 1.

Table 2 shows the reasons given by current users for starting/continuing to use cigarettes and/or alcohol.

Mean family incomes and monthly allowances of students using cigarettes and/or alcohol were higher than those of non-smokers/non-drinkers (Table 3).

Forty-six percent of students stated very few of the academic staff set a good example in terms of non-smoking. Twenty point two percent stated there were no good examples to follow at school for non-smok-

ing. Ninety-eight point one percent of participants stated that cigarettes were very harmful and 97.6% ( $n=646$ ) of smokers were aware of the dangers of smoking.

The rate of current smokers was significantly higher among students with parents, siblings or friends who smoke ( $p<0.05$ ). The rate of current smokers was significantly higher among students whose fathers smoked (33.2%,  $n=256$ ), than those whose fathers did not smoke (27.3,  $n=406$ ) ( $\chi^2=8.359$ ,  $p=0.004$ ). The rate of current smoking was significantly higher among students whose siblings (41.9%,  $n=253$ ,) and at least one of their three closest friends (40.5%,  $n=598$ ) smoked cigarettes than among those whose siblings (24.7%,  $n=409$ ) and at least one of their three closest friends (8.2%,  $n=64$ ) did not smoke ( $\chi^2=62.866$ ,  $p=0.0001$  for siblings;  $\chi^2=256.327$ ,  $p=0.0001$  for at least one of their three closest friends). There were no significant differences in the rate of current smoking between upper classmen (31.2%,  $n=268$ ) and freshman-

Table 2  
Students' reasons for starting/continuing to use cigarettes and/or alcohol<sup>a</sup>.

	<i>n</i>	%
Reasons for smoking (N=662)		
Affectation	275	41.5
Curiosity	213	32.1
Family problems	142	21.4
Solitude	136	20.5
School problems	133	20.0
For pleasure	38	5.7
Others (being an adult, friendship, distress etc)	63	9.5
Reasons for drinking alcohol (N=607)		
Curiosity	306	50.4
Distress	219	36.0
Friendship	173	28.5
No reason	95	15.6
To be brave	42	6.9
Others (pleasure, being an adult, business meeting etc)	39	6.4

<sup>a</sup> More than one answer may be given.

Table 3  
Distribution of family income and student allowances.

	Monthly family income (Mean±SD)	Monthly student allowance (Mean±SD)
Smoking		
Smokers	TL 971.36±672.42	TL 248.08±162.14
Non-smokers	TL 888.13±467.58	TL 211.11±127.02
	<i>p</i> =0.004	<i>p</i> =0.0001
Alcohol		
Users	TL 965.59±669.62	TL 257.29±155.12
Non-users	TL 892.75±477.03	TL 208.96±130.58
	<i>p</i> =0.014	<i>p</i> =0.0001

sophomores (28.2%, *n*=394,  $\chi^2=2.281$ , *p*=0.131, respectively).

The rate of current smoking was associated with the educational level of mothers but not fathers. There was no association between smoking status and other family factors, such as living arrangements during college, and family

status, such as living together or separately (Table 4).

The data indicate the students' use of alcohol increased with higher maternal education (*p*<0.05) but not with higher paternal education (*p*>0.05). Rates of alcohol use among college students according to maternal educational level (high,

Table 4  
Smoking status of students according to family factors.

	Smoker N=662 (%)	Non-smoker N= 1,596 (%)	$\chi^2$	<i>p</i>
Living status during education				
Family	309 (31.2)	680 (68.8)	3.567	0.168
Friends (dormitory/house)	318 (27.6)	836 (72.4)		
Others (relative, guest house)	35 (30.4)	80 (69.6)		
Maternal education level				
Illiterate	270 (28.8)	668 (71.2)	9.232	0.010
Primary, secondary or high school	285 (27.7)	744 (72.3)		
College	107 (36.8)	184 (63.2)		
Paternal education level				
Illiterate	86 (30.1)	200 (69.9)	0.745	0.689
Primary, secondary or high school	288 (28.4)	726 (71.6)		
College	288 (30.1)	670 (69.9)		
Family status (N=2,071) <sup>a</sup>			0.070	0.791
Living together	583 (28.7)	1,447 (71.3)		
Living separately	11 (26.8)	30 (73.2)		

<sup>a</sup>The students whose mothers and/or fathers were deceased were not evaluated.

Table 5  
Rates of use (at least once) of substance other than cigarettes and alcohol among students.

	Hashish <i>n</i> (%)	Heroin <i>n</i> (%)	Cocaine <i>n</i> (%)	Morphine <i>n</i> (%)	Inhalants <i>n</i> (%)	Other <i>n</i> (%)
Male	113 (7.1)	3 (0.2)	1 (0.1)	1 (0.1)	9 (0.6)	11 (0.7)
Female	18 (2.7)	-	-	-	1 (0.1)	1 (0.1)
Total	131 (5.8)	3 (0.1)	1 (0.0)	1 (0.0)	10 (0.4)	12 (0.5)

medium and low) were 34.4% (*n*=100), 28.8% (*n*=288) and 23.3% (*n*=219), respectively ( $\chi^2=14.891$ , *p*=0.001). More upper classmen (29.5%, *n*=254) used alcohol than freshman and sophomores (25.3%, *n*=254) ( $\chi^2=4.973$ , *p*=0.026). Alcohol use among college students was not associated with alcohol use among fathers (*p*>0.05), but the rate of alcohol use in students whose close friends drank alcohol (59.4%, *n*=320) was significantly higher compared with those

whose close friends did not drink alcohol (16.7%, *n*=287) ( $\chi^2=380.162$ , *p*=0.0001). If the mother used alcohol, the student was more likely to use alcohol and other addictive substances, excluding cigarettes and alcohol (*p*>0.05). The prevalence of alcohol use among students whose mothers drank alcohol was 72.7% (*n*=24) compared with 26.2% (*n*=583) among those whose mothers did not drink alcohol ( $\chi^2=35.810$ , *p*=0.0001).

Few participants (1.6%) stated they had a family member who used some form of illegal substance; 6.3% stated that they were aware of a classmate who used such substances and 12.4% stated they knew at least one person outside the school who used such substances. Six point six percent of students stated that they had used addictive substances other than cigarettes or alcohol at least once. Of these substances, hashish (5.8%) was the most widely used (Table 5).

The use of an addictive substance other than cigarettes and alcohol was significantly higher among male students (8.2%,  $n=130$ ) than females (3.0%,  $n=20$ ) ( $\chi^2=20.694$ ,  $p=0.001$ ). Of those, 31.4% ( $n=11$ ) had a family member who used some form of addictive substance, compared with 6.3% ( $n=139$ ) whose family members had never used drugs ( $\chi^2=35.216$ ,  $p=0.0001$ ).

## DISCUSSION

Tobacco smoking has had a marked decline over the past twenty years in most OECD (Organization for Economic Co-operation and Development) countries. The proportion of daily smokers among adults decreased from 43.6% in 1989 to 33.4% in 2006, but the smoking rate among adults in Turkey remains much higher than the OECD average of 23.3% (OECD Health Data, 2009). Some attempts have been made to reduce tobacco consumption in Turkey, such as a 2008 law restricting smoking in some indoor areas. Future cigarette consumption may be markedly reduced as a result of this recent legislation.

Since the late 1990s, cigarette smoking among college students in many countries has been on the rise (Lantz, 2003; Smith and Leggat, 2007). The rate of smok-

ing among college students was reported as 22.3% in 1997 by Wechsler *et al* (1998) and 32.9% in 1999 by Rigotti *et al* (2000). A study by Knapp *et al* (2001) during 1999-2000 of more than 14.5 million students enrolled in 4,182 colleges and universities showed that 4.35 million college and university students were currently smoking. Recent studies indicate that smoking among college students varies between 11.4% and 40% (Tamim *et al*, 2003; Moran *et al*, 2004; El-Roueiheb *et al*, 2008). Nationwide surveys done after 2002 showed the prevalence of smoking among college students in Turkey ranged from 21.6% to 64.4% (Alikasifoglu *et al*, 2002; Akvardar *et al*, 2004; Cooper *et al*, 2004; Altindag *et al*, 2005; Yilmaz *et al*, 2005; Aslan *et al*, 2006; Kilic and Ek, 2006). The present study found 29.3% of students currently use cigarettes; this rate was significantly higher among males than females. The mean age at which students started smoking was  $16.05 \pm 2.90$  years. A previous study found that approximately 80% of adult smokers started using tobacco before the age of 18 (WHO, 1998).

Epidemiological studies suggest the smoking initiation experience occurs primarily during adolescence. Evidence from a number of sources suggests the majority of smokers still try their first cigarette in early adolescence, and make the transition to habitual smoking by age 19 (Lantz, 2003). The reason for the increase among young adults is unclear, and may reflect a "cohort effect", as a previous group of high school smokers moves into older age groups (Wechsler *et al*, 1998). Increased feelings of social anxiety and pressure, separation from parents and a change in living area may be factors leading to smoking during this period. The reasons for adolescents and young adults smoking cigarettes and using other substances are

complex and not well understood. Smoking may play a role in the process of self-exploration by conveying information about identity in their new social environment (Nichter *et al*, 2010). Smoking while drinking was the most common reason for currently smoking (Levinson *et al*, 2007). Cigarettes involve a consumption event that facilitates social interaction among college students during study times when students feel isolated from their friends (Nichter *et al*, 2007). The primary reason for starting to smoke, and the main reason smokers continue to smoke, are reported as addiction and stress (Morrison *et al*, 2003).

Surprisingly, curiosity was the most important reason most smokers in the present study gave to begin/continue smoking cigarettes. We suggest this is the most important preventable reason for smoking. For this reason, persuasive education and other preventative programs may be an appropriate intervention strategy for college students who currently smoke. The findings of previous research and the present study show most currently smoking students have at least one close friend and a person within their family who smokes cigarettes; parental smoking patterns and attitudes may affect smoking habits (Newman and Ward, 1989; Isohanni *et al*, 1991; Riou França *et al*, 2009). Maternal smoking in particular influences the risk of lifetime smoking by the child (Kandel and Wu, 2002). Previous studies showed there are many variables associated with smoking, such as male sex, alcohol use, higher parental educational background (Tamim *et al*, 2003), higher socioeconomic status and middle-upper class socio-economic status. In general, the rate of smoking was higher among males than females (Greenberg *et al*, 1999; Onal *et al*, 2002; Saatci *et al*, 2004; Thompson *et al*, 2007).

Other studies have reported the opposite findings (Emmons *et al*, 1998; Moskal *et al*, 1999) and some studies found no association between smoking and gender (DeBernardo *et al*, 1999; Everett *et al*, 1999). The present study found lower levels of smoking among females. This may be related to cultural differences in the social role of females. Traditional cultural values in Turkey portray a negative view of smoking by women. Cigarette smoking among females is not well tolerated within Turkish society (Tot *et al*, 2004; Erdogan and Erdogan, 2009). Previous studies in Turkey showed the prevalence of smoking among final year university students was significantly higher than among first year students (Aslan *et al*, 2006; Erdogan and Erdogan, 2009). The prevalence of smoking was significantly higher among senior students than freshman-sophomore students, but the difference was not statistically significant.

Contrary to some studies that found that smoking increases with decreasing socioeconomic status (Tyas and Pederson, 1998; Malmstadt *et al*, 2001), the present study showed a high prevalence of cigarette smoking among students who had high family incomes and high monthly allowances. Adolescents coming from families of higher socio-economic status were at greater risk for smoking and drinking alcohol than those from families of lower socio-economic status, perhaps because financial advantages may increase access to these substances (Tot *et al*, 2004). Some previous studies have suggested a higher socio-economic status increases the risk of substance use (Baumrind, 1985; Miller and Miller, 1997). In a study by Tamim *et al* (2003), the authors speculated educated parents adopt more open attitudes towards adolescent smoking, and not actively oppose this habit. The great-

est prevalence of cigarette smoking was among students whose mother or father had a higher educational background (Tamim *et al*, 2003). In the present study, smoking was related to a higher educational background of the student's mother.

Most students thought teachers should not smoke in the classroom and should close the door of their office when smoking (Erdogan and Erdogan, 2009). Approximately half the students in the present study thought very few academic staff set a good example in terms of non-smoking. Twenty point two percent of students thought there were no good examples in school for not smoking. Attitude of educational personal may be a factor in smoking among college students and prevention programs must include members of faculty.

Alcohol consumption and related health risks are uncommon in Turkey. Per-capita consumption of alcohol is approximately 1.5 liters of absolute alcohol per year in Turkey. This value is 9.2 liters in Australia, 12.9 liters in Germany, 13.7 liters in Ireland and 4.1 liters in Lebanon (Karam *et al*, 2007).

Alcohol use among senior students was higher than freshman and sophomore students in the present study. Current alcohol use was associated with the educational levels of mothers, but not fathers. Alcohol use in the present study was more prevalent among students whose mothers had a high education level, similar to a previous study in Turkey (Tot *et al*, 2004). A study by Oksuz and Malhan (2005) conducted in Turkey's capital city, found alcohol use did not vary by study year and high maternal and paternal education levels were associated with increased student alcohol use. Tuinstra *et al* (1998) found more frequent alcohol use among older

youths and wealthy youths in the Netherlands. Several factors have been found to be associated with alcohol use, such as alcohol consumption being more common among men students, those receiving a higher allowance and those with a high family income (Refaat, 2004; Passos *et al*, 2006). High socio-economic status was previously reported to be related to heavier alcohol use (Oksuz and Malhan, 2005). In another study, the presence of at least one family member or a friend who used alcohol, was associated with increased alcohol use among students, but belief in God and family or negative attitudes of peers towards excessive drinking were found to be protective factors against alcohol use (Karam *et al*, 2004). Reasons reported for alcohol consumption included escaping problems, peer influence and having fun (Pillon *et al*, 2005). The most frequently reported reasons in the present study for starting/continuing to use alcohol were curiosity, stress and the influence of friends. In the present study, the use of alcohol by friends or the student's mother were strongly associated with a significantly increased prevalence of alcohol use. The relationship between parental influence and substance use has been noted in previous studies (Chassin *et al*, 1984; Tolone and Dermott, 1995). The majority of adolescents drink alcohol for the first time while with their parents (Braucht *et al*, 1973).

Some students in this study had exposure to alcohol and a large majority had the chance to try illicit drugs. The college environment presents a general risk for substance use. The prevalence of substance use among college students in Turkey is lower than in many other countries. A study by Tot *et al* (2004) of Mersin college students in Turkey reported a lifetime substance use rate of 4.7% for cannabis, 5%



for inhalants, and 3.9% for other illicit drugs. A study conducted in Turkey by İlhan *et al* (2009) reported the prevalence of cannabis use at least once was 5.9%, followed by Ecstasy (1.7%), solvents (0.6%), cocaine (0.4%), and heroin (0.2%). Another national study found lifetime Ecstasy use was 3.3% (Çorapçıoğlu and Ögel, 2004). The present study found 6.6% of students had used a substance other than cigarettes or alcohol at least once, with usage being higher among males than females. Those students whose mother used alcohol were more likely to try addictive substances than cigarettes or alcohol. Having a family member who used an addictive substance other than alcohol or cigarettes was associated with an increased rate of using an addictive substance at least once. We suggest this may be because parents who use illicit drugs may be more tolerant of substance use by their children. Previous studies showed the use of drugs by both family and peers influenced drug-taking behavior in adolescents (Feldman and Rosenkrantz, 1977; Swadi, 1988). Parental monitoring has been found to be a strong protective factor against adolescent substance use (Ennett *et al*, 2008). There is a strict intolerance in Turkish families towards substance use and Islam prohibits the use of alcohol and other substances. These cultural and religious prohibitions may play a protective role against substance use in our country.

The present study investigated the prevalence of substance use and factors influencing substance use among university students. Smoking and drinking of alcohol were the most common substances used, but other addictive substances were also used increasing health hazards for university students in eastern Turkey. The identification of smoking, alcohol and other substance use and determining rea-

sons for substance use will facilitate intervention via preventative programs in our region. Educational, preventative and treatment programs should be designed to target young adults during their college years. Interventions should include the manipulation of peer influence, parenting and family risk behaviors and education programs should involve education of parents. Possible environmental risk factors may be identified and living conditions should be improved, exposure opportunity should be decreased during college years. University policy stipulates substance-free activities for students who do not want to drink or use drugs. Students may be screened for prior substance use to help determine high-risk populations during the first year of education, and university health centers and/or social services may give support for the prevention and treatment needs of students and follow-up contact should be made.

## REFERENCES

- Akvardar Y, Demiral Y, Ergor G, Ergor A. Substance use among medical students and physicians in a medical school in Turkey. *Soc Psych Psych Epid* 2004; 39: 502-6.
- Alikasifoglu M, Erginoz E, Ercan O, Uysal O, Kaymak-Albayrak D, Ilter O. Cigarette smoking among Turkish high school students. *J Adolescent Health* 2002; 30: 7-8.
- Altindag A, Yanik M, Yengil E, Karazeybek AH. Substance use among University Students in Sanliurfa. *J Depend* 2005; 6: 60-4.
- Aslan D, Bilir N, Ozcebe H, Stock C, Kucuk N. Prevalence and determinants of adolescent smoking in Ankara, Turkey. *Turk J Cancer* 2006; 36: 49-56.
- Baumrind D. Familial antecedents of adolescent drug use: a developmental perspective. In: Jones JL, Battjes RJ, eds. Etiology of drug abuse: implications for prevention. *Res Monogr* 1985; 56: 13-44.

- Braucht G, Brakarsh D, Follingstad D, Berry KL. Deviant drug use in adolescence: a review of psychosocial correlates. *Psychol Bull* 1973; 79: 92-106.
- Chassin L, Presson CC, Sherman SJ, Montello D, McGrew J. Changes in peer and parent influence during adolescence: longitudinal versus cross-sectional perspectives on smoking initiation. *Dev Psychol* 1984; 22: 327-34.
- Chen K, Kandel DB. The natural history of drug use from adolescence to the mid-thirties in a general population sample. *Am J Public Health* 1995; 85: 41-7.
- Cooper R, Gorcegez P, Akturk N, Akyol S, Pocari E. Smoking habits of medical school students in Turkey: has anything changed? *Turk J Cancer* 2004; 34: 146-9.
- Çorapçioğlu A, Ögel K. Factors associated with ecstasy use in Turkish students. *Addiction* 2004; 99: 67-76.
- DeBernardo RL, Aldinger CE, Dawood OR, Hanson RE, Lee SJ, Rinaldi SR. An E-mail assessment of undergraduates' attitudes toward smoking. *J Am Coll Health* 1999; 48: 61-6.
- El-Roueiheb Z, Tamim H, Kanj M, Jabbour S, Alayan I, Musharrafieh U. Cigarette and waterpipe smoking among Lebanese adolescents, a cross-sectional study, 2003-2004. *Nicotine Tob Res* 2008; 10: 309-14.
- Emmons KM, Wechsler H, Dowdall G, Abraham M. Predictors of smoking among US college students. *Am J Public Health* 1998; 88: 104-7.
- Ennett ST, Foshee VA, Bauman KE, et al. The social ecology of adolescent alcohol misuse. *Child Develop* 2008; 79: 1777-91.
- Erdogan N, Erdogan I. Smoking at school: views of Turkish university students. *Int J Environ Res Public Health* 2009; 6: 36-50.
- Everett SA, Husten CG, Kann L, Warren CW, Sharp D, Crossett L. Smoking initiation and smoking patterns among US college students. *J Am Coll Health* 1999; 48: 55-60.
- Feldman BH, Rosenkrantz AL. Drug use be college students and their parents. *Addict Dis* 1977; 3: 235-41.
- Greenberg JL, Lewis SE, Dodd DK. Overlapping addictions and self-esteem among college men and women. *Addict Behav* 1999; 24: 565-71.
- Ilhan IO, Yildirim F, Demirbaş H, Dogan YB. Prevalence and sociodemographic correlates of substance use in a university-student sample in Turkey. *Int J Public Health* 2009; 54: 40-4.
- Isohanni M, Moilanen I, Rantakallio P. Determinants of teenage smoking, with special reference to non-standard family background. *Br J Addict* 1991; 86: 391-8.
- Kandel D, Wu P. The contributions of mothers and fathers to inter-generational transmission of cigarette smoking in adolescence. *J Res Adolesc* 1995; 52: 225-52.
- Karam E, Kypri K, Salamoun M. Alcohol use among college students: an international perspective. *Curr Opin Psychiatry* 2007; 20: 213-21.
- Karam EG, Maalouf WE, Ghandour LA. Alcohol use among university students in Lebanon: prevalence, trends and covariates. The IDRAC University Substance Use Monitoring Study (1991 and 1999). *Drug Alcohol Depend* 2004; 76: 273-86.
- Kiliç N, Ek NH. Knowledge, Behavior and manner of conduct for cigarette in Adnan Menderes University Health School and Vocational School of Health Students. *J Health Sci* 2006; 15: 85-90.
- Knapp LG, Kelly JE, Whitmore RW, et al. Postsecondary institutions in the United States: fall 2000 and degrees and other awards conferred: 1999-2000. Washington DC: US Department of Education, National Center for Education Statistics, 2001.
- Lantz PM. Smoking on the rise among young adults: implications for research and policy. *Tob Control* 2003; 12: 60-70.
- Levinson AH, Campo S, Gascoigne J, Jolly O,

- Zakharyan A, Tran ZV. Smoking, but not smokers: identity among college students who smoke cigarettes. *Nicotine Tob Res* 2007; 9: 845-52.
- Malmstadt JR, Nordstrom DL, Carty DC, *et al.* Cigarette smoking in Wisconsin: the influence of race, ethnicity, and socioeconomics. *WMJ* 2001; 100: 29-33.
- Miller DS, Miller TQ. A test of socioeconomic status as a predictor of initial marijuana use. *Addict Behav* 1997; 22: 479-89.
- Moran S, Wechsler H, Rigotti N. Social smoking among U.S. college students. *Pediatrics* 2004; 114: 1028-34.
- Morrison K, Banas J, Burke M. Understanding college students' salient attitudes and beliefs about smoking: distinctions between smokers, nonsmokers, and ex-smokers. *Public Health Rev* 2003; 31: 95-109.
- Moskal PD, Dziuban CD, West GB. Examining the use of tobacco on college campuses. *J Am Coll Health* 1999; 47: 260-5.
- Newman IM, Ward JM. The influence of parental attitude and behavior on early adolescent cigarette smoking. *J Sch Health* 1989; 59: 150-2.
- Nichter M, Nichter M, Carkoglu A. Tobacco Etiology Research Network. Reconsidering stress and smoking: a qualitative study among college students. *Tob Control* 2007; 16: 211-4.
- Nichter M, Nichter M, Carkoglu A, Lloyd-Richardson E. The Tobacco Etiology Research Network (TERN). Smoking and drinking among college students: "It's a package deal". *Drug Alcohol Depend* 2010; 106: 16-20.
- OECD Health Data 2009. How does Turkey compare. 2009. [Cited 2010 Jan 16]. Available from: URL: [http://www.oecd.org/LongAbstract/0,3425,en\\_33873108\\_33873854\\_38980478\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/LongAbstract/0,3425,en_33873108_33873854_38980478_1_1_1_1,00.html)
- Oksuz E, Malhan S. Socioeconomic factors and health risk behaviors among university students in Turkey: questionnaire study. *Croat Med J* 2005; 46: 66-73.
- Onal AE, Tumerdem Y, Ozel S. Smoking addiction among university students in Istanbul. *Addict Biol* 2002; 7: 397-402.
- Passos S, Brasil P, Santos M, Aquino MT. Prevalence of psychoactive drug use among medical students in Rio de Janeiro. *Soc Psychiatry Psychiatr Epidemiol* 2006; 41: 989-96.
- Pillon SC, O'Brien B, Piedra Chavez KA. The relationship between drugs use and risk behaviors in Brazilian university students. *Rev Lat Am Enfermagem* 2005; 13: 1169-76.
- Refaat A. Practice and awareness of health risk behaviour among Egyptian university students. *East Mediterr Health J* 2004; 10: 72-81.
- Rigotti NA, Lee JE, Wechsler H. U.S. college students' use of tobacco products: results of a national survey. *JAMA* 2000; 284: 699-705.
- Riou França L, Dautzenberg B, Falissard B, Reynaud M. Are social norms associated with smoking in French university students? A survey report on smoking correlates. *Subst Abuse Treat Prev Policy* 2009; 4: 4.
- Saatci E, Inan S, Bozdemir N, Akpınar E, Ergun G. Predictors of smoking behavior of first year university students: questionnaire survey. *Croat Med J* 2004; 45: 76-9.
- Smith DR, Leggat PA. An international review of tobacco smoking among medical students. *J Postgrad Med* 2007; 53: 55-62.
- Swadi HS. Adolescent drug taking: role of family and peers. *Drug Alcohol Depend* 1988; 21: 157-60.
- Tamim H, Terro A, Kasem H, *et al.* Tobacco use by university students, Lebanon. *Addiction* 2003; 98: 933-9.
- Thompson B, Coronado G, Chen L, *et al.* Prevalence and characteristics of smokers at 30 Pacific Northwest colleges and universities. *Nicotine Tob Res* 2007; 9: 429-38.
- Tolone WL, Dermott D. Some correlates of drug use among high school youth in rural community. *Int J Addict* 1995; 10: 761-77.
- Tot S, Yazici K, Yazici A, Metin O, Bal N, Erdem P. Psychosocial correlates of substance use

- among adolescents in Mersin, Turkey. *Public Health* 2004; 118: 588-93.
- Tuinstra J, Groothoff JW, van den Heuvel WJ, Post D. Socio-economic differences in health risk behavior in adolescence: do they exist? *Soc Sci Med* 1998; 47: 67-74.
- Tyas SL, Pederson LL. Psychosocial factors related to adolescent smoking: a critical review of the literature. *Tob Control* 1998; 7: 409-20.
- Webb E, Ashton H, Kelly P, Kamali F. Patterns of alcohol consumption, smoking and illicit drug use in British university students: interfaculty comparisons. *Drug Alcohol Depend* 1997; 47: 145-53.
- Weinberg NZ, Rahdert E, Colliver JD, Glantz MD. Adolescent substance abuse: a review of the past 10 years. *J Am Acad Child Adolesc Psychiatry* 1998; 37: 252-61.
- Wechsler H, Rigotti NA, Gledhill-Hoyt J, Lee H. Increased levels of cigarette use among college students: a cause for national concern. *JAMA* 1998; 280: 1673-8.
- World Health Organization (WHO). The World Health Report—Life in the 21<sup>st</sup> century: a vision for all. Geneva: WHO, 1998.
- Yilmaz G, Karacan C, Yöney A, Yilmaz T. Brief intervention on maternal smoking: a randomized controlled trial. *Child Care Health Dev* 2005; 32: 73-9.