Substance and Alcohol use in Young Adults in Turkey as Indicated by the CAGE Questionnaire and Drinking Frequency

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ABSTRACT

Introduction: The purpose of this study was to determine drinking problems and to analyze the socio-demographic factors associated with problematic alcohol use in young adults.

Methods: The study included 262 students who were surveyed for substance use problems in a postgraduate program using the Cut down, Annoyed, Guilty, Eye opener (CAGE) Questionnaire. The relationships between socio-demographic variables and alcohol use were assessed using both univariate and multivariate analyses.

Results: Of the whole sample, 56.11% reported that they had tried drinking alcohol and 1.91% had tried cannabis. The prevalence of problematic alcohol use was 15.3% and 29.7% according to CAGEI+ and past-year drinking frequency, respectively. Alcohol use by mothers

was an important differentiating factor for alcohol use by their daughters. Graduating from a university located in the Eastern/Southeastern Anatolia regions, graduating from a private high school, and having average academic performance levels were determinants of problematic alcohol use according to CAGEI+ and frequency of drinking.

Conclusion: This study suggests there is need for early intervention to prevent exposure to the risk factors for problematic alcohol use in young adults, emphasizing that probable presence of an alcohol use disorder and high frequency of drinking are related to socio-demographic factors (high school type, geographical location of the university, and family structure).

Keywords: Alcohol use, substance use, prevalence, socio-demographic factors, CAGE questionnaire

INTRODUCTION

Adolescence and young adulthood are critical periods for the development of substance use. The prevalence of substance use, particularly alcohol use, among young people increases over time. Alcohol is the most experimented, repeatedly used, and abused substance, and its use typically peaks during young adulthood (1,2). Recent studies have showed that experimentation with alcohol is rather normative in adolescence and many adolescents develop a regular drinking pattern (3,4,5,6,7). After an initial increase in alcohol consumption, many students show a gradual reduction in alcohol consumption to moderate levels in university and the following years. The drinking pattern of young adults is relatively variable. The transition from adolescence to young adulthood is a particularly crucial period in the development of patterns of substance use. Alcohol consumption causes weak bonds with the family, academic difficulties, and risk behaviors such as fighting, suicide, unplanned sexual activities, and motor vehicle activities in young.

A study in the Netherlands in 2000 showed that among those aged 21-25 years and 26-30 years, approximately 30% of males and 7%-10% of females were problem drinkers (8). In a longitudinal cohort study, problematic substance use steadily increased from 1994 to 2001, and 48.9% of the subjects had problematic use in the Canton of Zurich (9). Approximately 5%-15.45% of a sample reported repeatedly using alcohol, tobacco, and marijuana at some point in their lifetime (10). Although substance use is more prevalent among males, substance use among female students has increased in the recent years (11). Several studies have found that adolescents who begin to use alcohol very early are at a greater risk for the later development of alcohol abuse or dependence (12,13,14).

Turkey has geographically separated regions. The regions share borders with Europe (the Marmara region) and the Middle East (the Eastern/Southeastern Anatolia regions). The geographical location of Turkey allows different cultural influences both from Muslim countries, where alcohol use is religiously and/or lawfully forbidden, and from European countries, where alcohol use is highly prevalent. It has been observed that western culture and lifestyle strongly influence young people, in particularly with regard to the acceptance of alcohol consumption.

In Turkey, although purchasable alcohol is forbidden by an individual younger than 18, alcohol remains the most widely used substance among adolescents. Furthermore, illicit substance use is legally restricted in Turkey. However, younger people in Turkey are exposed to alcohol and other substances and drink more frequently than adults. Biological, psychological, and particularly cultural factors

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Table 1. Ratio of the CAGE Questionnaire items

CAGE Questionnaire items	Yes		No	
	n	%	n	%
"Have you ever felt you ought to cut down on your drinking?"	22	8.4	87	33.2
"Have people annoyed you by criticizing your drinking?"	18	6.9	91	34.7
"Have you ever felt bad or guilty about your drinking?"	26	9.9	83	31.7
"Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?"	0	0.0	108	41.2

Table 2. Socio-demographic and background characteristics of the respondents, n=262

Characteristic	n	%
Gender		
Male	89	34.0
Female	173	66.0
Marital status		
Single	222	84.7
Married	38	14.5
Not stated	2	0.8
High school type		
Public high school	195	74.4
Anatolian high school	45	17.2
Private high school	17	6.5
Not stated	5	1.9
Employment status		
Employed	73	27.9
Unemployed	188	71.8
Not stated	1	0.4
Residence		
At home with family	129	49.2
At home with friends	57	21.8
At home alone	10	3.8
In a student dormitory	44	16.8
Other	22	8.4
Geographical location of the university		
Mediterranean/Aegean regions	39	14.9
Central Anatolia region	135	51.5
Eastern/Southeastern Anatolia regions	30	11.5
Marmara region	39	14.9
Not stated	19	7.3
Subjective evaluation of academic performance		
Poor	4	1.5
Average	76	29.0
Good	150	57.3
Very good	31	11.8
Not stated	1	0.4
Subjective evaluation of family income		
Poor	4	1.5
Average	76	29.0
Good	150	57.3
Very good	31	11.8
Not stated	1	0.4

are important to determine the prevalence of substance use problems (1,3,15,16,17).

According to the Global Status Report on Alcohol (WHO, 2004), the alcohol use rate in 2000-2001 was 19.6% in the general Turkey population and the prevalence of substance use was 1.3%. Several studies about substance use have reported that 13.8%-70.0% university students have ever tried alcohol and 2.0%-8.0% have ever tried illicit substances such as cannabis, inhalants, and ecstasy during their lifetime in Turkey (2,5,7, 15,16,18,19,20,21,22,23). The differences between the results of these previous studies are possibly due to varying sample sizes, age, and different patterns of alcohol problems as well as the variables used. Researchers have mostly focused on substance use among adolescents/university students. To the best of our knowledge, there has been no study about socio-demographic factors of postgraduate university students in Turkey. To identify students' patterns of substance use, it is essential to describe them in detail. This study sample consists of young adults who were pursuing a postgraduate program in a university. Young adults who are university graduates are different from university students because of adult responsibilities such as marriage, work, and certain environmental and social factors. Some of the students attend a Masters program, but their parents usually give economic support to their daughters/sons before entering the workplace. In addition, some of them take the responsibilities of a marriage and/or a job while they continue with their postgraduate education. Conversely, drinking is generally perceived as an adult behavior and social acceptability of alcohol consumption is encouraged in Turkey. All these psychosocial developmental issues could be critical factors in substance use in young adults. Studies to identify factors associated with youth drinking and to estimate the anticipated risk of students' problem drinking are needed to provide evidence for effective preventive programs.

The aims of this study were to describe the prevalence of problematic drinking and to analyze the socio-demographic factors (geographical location of the university, and parental alcohol use) associated with problematic alcohol use during young adulthood in a specific population of postgraduate students in Turkey.

METHODS

Study Population

This study included young people who were pursuing a postgraduate (Masters) program in Baskent University Institute of Educational Sciences. This university was selected because of the ease of access to the sample by the author and because the students came from different geographical locations. The study was approved by the Baskent University Institute of Educational Sciences.

Lecturers of a required course distributed questionnaires to the respondents who voluntarily completed them. Informed consent was obtained from the respondents, and they were explained about their rights to participate or not in the study. In addition, the respondents were instructed to place the completed questionnaire forms in an envelope before returning. A total 262 students accepted to participate in the study.

Measures

Data gathered on lifetime substance experimentation and repeated use were collected using a self-report questionnaire (24,25). This questionnaire consisted of questions related to socio-demographic characteristics and academic and job statuses. The pattern of alcohol use was assessed by asking questions on ever use of alcohol, use of alcohol in the past year, and frequency of drinking. The questionnaire also included questions on ever use and frequency of use of cannabis, solvents, ecstasy, heroin, and cocaine.

The Cut down, Annoyed, Guilty, Eye opener (CAGE) questionnaire was used to identify the problems of alcohol use. This instrument has been used in previous surveys conducted in Turkey; therefore, it was used in the present study with the aim of comparing the results (3,4,7,16,20). The CAGE questionnaire derives its name from the acronym of 4 questions (Table 1). The questions were dichotomous ("no" and "yes").

The score on the CAGE scale was determined by adding the answers of the 4 questions. A cut-off point of ≥ 1 positive answers on the CAGE scale was shown to be the most valid. Probable presence of an alcohol use disorder was indicated by a score of 1+.

Statistical Analysis

The mean age of first use of alcohol and drinking more than once were tested for gender differences by Student's t test. Chi-square analysis was performed for evaluating the relationships between genders considering the place and the person with whom they first used alcohol. In addition, the relationships between socio-demographic and background variables (gender, employment status, high school type, residence, geographical localization of the university, subjective evaluation of academic performance, and subjective evaluation of family income) and alcohol use were analyzed by chi-square analysis. Alcohol use was evaluated

in terms of either presence or absence of an alcohol use problem according to the CAGE 1+ cut-off score and past-year drinking frequency. Past-year drinking frequency was defined as drinking fortnightly or more frequently.

Subsequently, the relationships that were found to be at the $p=0.15$ significance level or below in univariate analysis were reassessed using logistic regression models. Presence of alcohol use problems according to the CAGE 1+ cut-off score and frequency of drinking were taken as the dependent variables in logistic regression analysis. The regression model was then computed 2 times. Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA) 16.0 was used for all statistical analyses.

RESULTS

A total of 262 students or 56.96% of the sample (173 females, 89 males) took part in the study. The mean age of the sample was 25.60 ± 2.23 years (range: 21-32 years). The mean age of females was 25.22 ± 2.19 years and that of males was 26.37 ± 2.12 years. The socio-demographic and background characteristics of the students are given in Table 2.

Of the whole sample, 56.11% reported that they had tried drinking alcohol. Among these users, 3.05% stated that they had experimented with both alcohol and other substances. The prevalence of drinking more than once during their lifetime was 44.7%. The results indicated that 1.91% of the sample had tried cannabis, and 0.38% had tried solvents only once in their lifetime, whereas 1.53% had used cannabis more than once. No other substance was reportedly used. Statistically significant differences were found between genders with respect to the last-year, last-month, and last-week alcohol use prevalence rates ($\chi^2=3.362$, $p=0.045$; $\chi^2=4.713$, $p=0.022$; and $\chi^2=7.434$, $p=0.007$; respectively).

The mean age of first use of alcohol was 17.91 ± 3.09 years. No statistically significant difference was found between genders in terms of the mean age of first alcohol use ($t=1.847$, $df=135$, $p=0.067$). The mean age of first alcohol users who drank more than once in their lifetime was higher among females (18.11 ± 2.22 years) than among males (16.95 ± 3.69 years) ($t=2.022$, $df=135$, $p=0.046$). There was a statistically significant relationship between genders with respect to the place and the person with

Table 3. Relation between parental alcohol use and student's alcohol use in the past year according to gender

Gender	Alcohol use by mother	Alcohol use in the past year				χ^2
		Yes		No		
		n	%	n	%	
Female	Yes	9	100.0	0	0.0	15.020 ^b
	No	58	35.4	106	64.6	
Male	Yes	1	100.0	0	0.0	0.989
	No	44	50.0	44	50.0	
Gender	Alcohol use by father	n	%	n	%	χ^2
Female	Yes	24	85.7	4	14.3	31.080 ^b
	No	43	29.7	102	70.3	
Male	Yes	9	90.0	1	10.0	7.010 ^a
	No	36	45.6	43	54.4	

^a $p<0.05$, ^b $p<0.01$

whom they first used alcohol ($\chi^2=14.338$, $p=0.014$). Substance use other than alcohol had been experimented mostly at home (37.8%) and in bars with friends (21.6%).

The overall prevalence of alcohol use problems according to CAGEI+ was 15.3%. In terms of past-year drinking frequency, 40.3% answered that they had been drinking once a month or less frequently and 29.7% had been drinking fortnightly or more frequently.

Mother's and father's use of alcohol was related to children's alcohol use in the past year ($\chi^2=13.924$, $p=0.000$ and $\chi^2=8.484$, $p=0.004$, respectively). Parental alcohol use history was investigated according to gender. Parents' drinking was significantly related to alcohol use in the past year for females. Conversely, only fathers' drinking was related to alcohol use in the past year for males (Table 3). If the father of a female did not use alcohol, the child did not use alcohol. On the other hand, if the father of a male did not use alcohol, the child still used alcohol. The percentage of males who used alcohol was higher than the percentage of their fathers who did not use alcohol. Use of alcohol by mothers was related to a similar use by their female children. Parental alcohol use history did not differ significantly between the CAGEI+ female student and CAGEI+ male student groups.

Students who graduated from private high schools consumed alcohol at least fortnightly or more frequently when compared with students who graduated from Anatolian and public high schools ($\chi^2=9.040$, $p=0.011$). As the academic performance of the students increased, problematic and frequent alcohol use increased ($\chi^2=9.402$, $p=0.022$ and $\chi^2=3.734$, $p=0.050$, respectively). A greater percentage of students in the Eastern/Southeastern Anatolia regions used alcohol more problematically than any other geographical locations according to CAGEI+ ($\chi^2=9.630$, $p=0.022$) (Table 4).

The statistically significant relationships were tested by constructing 2 logistic regression models. The significant relationship between the geographical location of the university and CAGEI+ in univariate analysis did not appear in multivariate analysis. According to the results of logistic regression analysis, graduating from a university located in the Eastern/Southeastern Anatolia regions (odds ratio=1.78), graduating from private high schools (odds ratio=18.14), and having an average level of academic performance (odds ratio=2.98-3.15) were determinants of problematic alcohol use with regard to CAGEI+ and frequent drinking (Table 5).

DISCUSSION

The present study measured substance use characteristics of university students who were pursuing postgraduate programs were aged between 21 and 32 years. The most experimentally used substances were alcohol and cannabis. In the US, the prevalence rate of experimentation ranges from 48.06% to >90%; the rate of repeated use is >80% in individuals aged ≥ 23 years (26). In the Netherlands, the prevalence rate of regular drinking ranges from 53.8% to 80.4% between the ages of 21-25 years (27). By the age of 26.91% of youths have used alcohol in France (28). The prevalence of current drinking among university students in Turkey is approximately 36.7% (4). The differences in the rates of substance use may emerge from the alcohol use patterns and cultural differences.

The prevalence of drinking in lifetime is lower for university students. In university students, the prevalence of drinking in lifetime ranges from 42% to 95% in European countries and from 26.9% to 81.9% in Turkey, where-

Table 4. Univariate analysis of alcohol use problems

Variables	CAGEI+		Alcohol use fortnightly or more frequently	
	n	%	n	%
Gender				
Male	20	45.5	13	36.1
Female	20	31.2	14	25.5
High school type				
Public high school	31	36.5	18	25.0
Anatolian high school	6	37.5	4	30.8
Private high school	3	42.9	5	83.3 ^a
Employment status				
Employed	10	30.3	5	18.5
Unemployed	30	40.0	22	34.4
Residence				
At home with family/in a student dormitory	25	36.2	13	22.4
At home alone/with friends	12	37.5	11	42.3
Geographical location of the university				
Mediterranean/Aegean regions	5	29.4	3	21.4
Central Anatolia region	16	29.1	14	29.2
Eastern/Southeastern	10	71.4 ^a	2	18.2
Anatolia regions				
Marmara Region	8	47.1	5	38.5
Subjective evaluation of academic performance				
Average	18	58.1 ^b	11	55.8
Good/very good	20	26.7	6	24.6
Subjective evaluation of family income				
Poor/average	18	39.5	8	21.6
Good/very good	21	38.2	17	36.2

^a $p<0.05$ ^b $p<0.01$

as it is 74% in Israel and 96.4% in Brazil (15,16,18,29,30,31). The frequency of heavy drinking in late adolescence tends to devolve to social drinking after finishing university studies and assuming adult responsibilities.

The use of illicit substances was rare, with cannabis being the most commonly used illicit substance. Students who consume cannabis have higher frequencies and volumes of alcohol consumption (10,32,33). Social drinking settings often increase modeling of drinking and easy availability of alcohol, which may lend itself to greater rates of problematic drinking (34). Özgür-Ilhan et al. (10) found that the prevalence of cannabis use at least once during lifetime was 5.9% in university students in Turkey.

In the present study, the prevalence of problematic alcohol use was determined to be 15.3% and 29.7% according to CAGEI+ and past-year drinking frequency, respectively. These rates are lower than reported by

Table 5. Logistical regression analysis of alcohol use problems

	CAGEI+		Alcohol use fortnightly or more frequently	
	Model 1		Model 2	
	Exp (B)	95% CI	Exp (B)	95% CI
Gender				
Male	0.871	0.330-2.302		
Female	1.000			
Geographical location of the university				
Marmara region	1.000			
Mediterranean/Aegean regions	0.447	0.103-1.935		
Central Anatolia region	0.473	0.147-1.523		
Eastern/Southeastern Anatolia regions	1.778 ^a	1.169-8.510		
Subjective evaluation of academic performance				
Average	3.154 ^a	1.169-8.510	2.979	0.797-11.130
Good/very good	1		1.000	
High school type				
Public high school			1.000	
Anatolian high school			0.890	0.176-4.510
Private high school			18.139 ^a	1.697-193.916
Residence				
At home with family/in a student dormitory			1.000	
At home alone/with friends			2.476	0.654-9.374
Employment status				
Employed			0.471	0.100-9.374
Unemployed			1.000	
Subjective evaluation of family income				
Poor/average			0.460	0.134-2.219
Good/very good			1.000	
^a p<0.05				

other studies in Turkey carried out to determine the rate of alcohol use problems in university students (10,21,25). Changes in social roles and assuming job and marriage responsibilities and a parental role are, to a large extent, accountable for a drop in heavy and problematic drinking (35).

In the present study, only 4 students evaluated their academic performance as low. Therefore, the low group was combined with the average group. In the analysis, academic performance was categorized into 2 groups: poor/average and good/very good. According to our study results, academic performance appears to be predictive of alcohol use. Average academic performance has the highest risk of probable presence of an alcohol use disorder three times. The predictor of CAGEI+ was academic performance. In contrast, other studies have indicated low academic achievement, as subjectively stated by the student, to be associated with a greater probability of substance use (23,25). This is probably a reciprocal causal relationship. In this study, poor academic performance was considered in conjunction with average academic performance. Therefore, average academic performance may correspond to low academic performance in other studies.

High school type and university culture in Turkey were associated with alcohol use problems. Students who graduated from private high schools had an increased risk of drinking fortnightly or more frequently. Students who attend a private school generally belong to high family income groups and have a more tolerant family environment, particularly with regard to alcohol use. Therefore, less-conservative structure of the family is a significant for problematic drinking. Other studies have also indicated that alcohol-drinking problems are associated with a high socio-economic level (25,33). Drinking patterns develop primarily in high school or earlier and do not change considerably in the transition from high school onward. Once initiation has occurred, no other factor becomes important.

Turkey has been geographically separated into different regions. Students in the regions bordered by Europe (the Marmara region) and Middle East countries (the Eastern/Southeastern Anatolia regions) were likely to have drinking problems. These findings indicate that students who graduated from a university located in the Eastern/Southeastern Anatolia regions (OR=1.169-8.510) had a higher risk of developing alcohol use problems. The Eastern/Southeastern Anatolia regions represent transition regions 33

between East and West and are under the influences of both Arabic-Muslim and Western cultures. Multicultural influences are associated with problematic alcohol use. The characteristics of the region may play a role in drinking. Similarly, 2 studies have described the profile of university students' substance use in the Eastern and Southeastern Anatolia regions. The percentage of those who tried drinking only once ranged from 26.9% to 30.4%. This rate is higher than that reported by studies conducted in other regions (7,25,31).

Although the age of first experiment of drinking did not differ between genders, female alcohol users began drinking later and more than once in their lifetime than males did. The prevalence rates of alcohol use between genders were found to be higher when the findings were compared with the results reported by similar studies (9,35). Gender difference is related to both biological and socio-cultural factors. Biologically, women are more intolerant of alcohol and easily get drunk with fewer amounts of alcohol. Therefore, the drinking pattern of men is different. Drinking greater quantities of alcohol but less frequently has been associated with greater alcohol-related problems in men (1,4,8,10,12,14,32,36). Furthermore, the gender gaps in drinking behavior have narrowed in the recent decades (37), which may be attributed to the changes in cultural attitudes toward drinking.

This study provides some support for the view that parental alcohol use is a very important factor for using alcohol. In experimentation and use of alcohol, males take their fathers as role models, but females take both their mothers and fathers (6,13,27,35,38,39). Children's alcohol use is related to their family structure. Alcohol use by mothers is an important and differentiating factor for alcohol use by their daughters, but it is not important for their sons. If a mother does not use alcohol, her daughter similarly does not use alcohol. In Turkey, drinking behavior among women is socially less acceptable compared with that among men. Thus, alcohol use by the mother reflects the family's culture, and such as family appears to have more liberal attitudes towards substance use. Knop et al. (40) reported that a father's alcoholism by itself does not independently contribute to the prediction of the son's drinking. However, there is a significant overlap between the genetic factors influencing the frequency of use and alcohol problems at around the age of 25 for both genders (26,36).

The results of this study should be viewed in the context of some limitations. The response rate was low (57% of the sample). There may be non-respondents (43%) who possibly used substances at higher rates than the respondents. While interpreting the results, it should be kept in mind that the generalizability of the results is limited. The study findings may not be applicable to students in different academic fields. The limited sample size prevented a more discriminating categorization and examination of factors (such as the marital and employment status) as it relates to drinking behavior over time we used self-reports of substance use. The reliance on self-report measures is another limitation.

This study suggests a need for early intervention to prevent exposure to risk factors for problematic alcohol use, emphasizing that probable presence of an alcohol use disorder and high frequency of drinking are related to socio-demographic factors (high school type, geographical location of the university, and family structure). Health promotion and prevention efforts that focus on these factors should be directed toward university students. If young adults focus on recognizing the potential threat of alcohol use problems at a young age, alcohol use problems will be prevented before they develop. In addition, this intervention, involving parents could

be a focus for the prevention of problematic drinking by increasing awareness regarding substance use.

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