

# Prevalence of Risky Behaviors and Relationship of Risky Behaviors with Substance Use Among University Students

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## ABSTRACT

Prevalence of risky behaviors and relationship of risky behaviors with substance use among university students

**Objective:** This study aims to evaluate the prevalence of risky behaviors, frequently encountered in young adulthood, and the relationship between such behaviors and substance use in the university population.

**Method:** This cross sectional, web-based, self-report study was carried out in a state university with 53,003 students. The power analysis was conducted according to the lowest prevalence (0.01%-0.6%) of substance use in universities in Turkey. A sample of 3,184 people was found to be sufficient for the research. The data of 2,973 individuals who completed the Addiction Profile Index was evaluated. Frequency tests, Pearson chi-square and logistic regression were used in the statistical analysis.

**Results:** As participants 1,629 (54.8%) females and 1,344 (45.2%) males were included in the study. Suicidal plans or attempts and self-harming behaviors were significantly more prevalent among female students; carrying a weapon (penknife/knife/gun), engaging in physical fights, sustaining injuries in physical fights, early sexual relation experiences, condom usage, cigarette, alcohol, energy drink and substance consumption were significantly more prevalent among male students ( $p<0.001$ ). Frequent suicidal plans or attempts (11.3 times) and early sexual experiences, before the age of 15 (16.6 times) were found to be riskier behaviors with regard to substance use; as the consumption of cigarettes, alcohol and energy drink increased, so did the risk of substance use.

**Conclusion:** Gender is a distinctive characteristic with regard to risky behaviors among young people. The relationship between risky behaviors and substance use suggests that one risky behavior may lead to another. As such, it is necessary to evaluate the substance use among young people with risky behaviors and to examine other risky behaviors which accompany the substance use problems.

**Keywords:** Risk-taking, substance abuse, university students

## ÖZET

Üniversite öğrencilerinde riskli davranışların yaygınlığı ve riskli davranışların madde kullanımı ile ilişkisi

**Amaç:** Genç yetişkinlik döneminde sıklıkla karşılaşılan riskli davranışların üniversite popülasyonundaki yaygınlığı ve madde kullanımı ile ilişkisinin değerlendirilmesi amaçlanmıştır.

**Yöntem:** Kesitsel, web-tabanlı, öz bildirim dayalı çalışma, 53,003 öğrencisi olan bir devlet üniversitesinde gerçekleştirilmiştir. Örneklem sayısı için, Türkiye'deki üniversitelerde madde kullanımının en düşük prevalansına (%0.01%-0.6) göre güç analizi kullanılmıştır. Araştırma için 3,184 kişilik örneklem sayısı yeterli bulunmuştur. Bağımlılık Profil İndeksi Anketini tamamlayan 2,973 kişinin verileri değerlendirilmiştir. İstatistiksel analizlerde frekans testleri, Pearson ki-kare ve lojistik regresyon kullanılmıştır.

**Bulgular:** Araştırmaya 1,629 (%54.8) kadın ve 1,344 (%45.2) erkek katıldı. Kadınlarda intihar planı ya da girişimi ve kendine zarar verme davranışı (KZVD); erkeklerde çakı, bıçak, tabanca gibi silahları taşıma, kavga etme ve yaralanma, erken yaşta cinsel ilişki deneyimi, kondom kullanımı, sigara, alkol, enerji içeceği ve madde kullanımı anlamlı düzeyde yüksek bulundu ( $p<0.001$ ). Sık intihar planı ve girişimi (11.3 kat), 15 yaşından önce cinsel ilişki deneyimi (16.6 kat) madde kullanımında daha riskli davranışlar olarak bulundu. Sigara, alkol ve enerji içeceği kullanım sıklığı arttıkça madde kullanımı riskinin de arttığı saptandı.

**Sonuç:** Gençlerde, risk alma davranışlarında cinsiyet faktörü ayrıncı özelliklerden biridir. Riskli davranışlar ve madde kullanımı arasındaki ilişki, bir riskli davranışın başka bir riskli davranışa yol açabileceğini düşündürür. Bu nedenle, riskli davranışlarda bulunan genç yetişkinlerde madde kullanımını, madde kullanım sorunu ile gelen genç yetişkinlerde de diğer riskli davranışların değerlendirilmesi gerekir.

**Anahtar kelimeler:** Riskli davranışlar, madde kullanımı, üniversite öğrencileri



**How to cite this article:** Atlam DH, Aldemir E, Altintoprak AE. Prevalence of risky behaviors and relationship of risky behaviors with substance use among university students. Dusunen Adam The Journal of Psychiatry and Neurological Sciences 2017;30:287-298.  
<https://doi.org/10.5350/DAJPN2017300402>

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Date of receipt / Geliş tarihi:  
March 15, 2017 / 15 Mart 2017

Date of the first revision letter /  
İlk düzeltme öneri tarihi:  
April 18, 2017 / 18 Nisan 2017

Date of acceptance / Kabul tarihi:  
May 14, 2017 / 14 Mayıs 2017

This study was presented as poster at the 8<sup>th</sup> National Alcohol and Substance Addiction Congress

## INTRODUCTION

Youth, in addition to being a time in which difficulties stemming from social and personal transformation are experienced, carries significance as a period in which individuals experience identity development (1). According to Dryfoos (1990), self-awareness, forming one's own personal values, problem-solving, decision-making, and gaining one's own emotional independence can become sources of stress during this time, giving way to a tendency for risky behaviors (1). According to the World Health Organization, reproductive health problems, substance abuse, eating disorders, psychological problems, and risky behaviors are frequently experienced during this time of life (2,3).

Risky behaviors, the source of which is mostly attributed to the characteristics of adolescence, carry attributes that may pose a problem during other periods of one's life, preventing individuals from becoming responsible adults (4,5). Such behaviors are defined by Jessor (1998) as harmful behaviors that may lead to undesired social or developmental results and may be harmful to one's health, even posing threats to one's life (1); these include sensation-seeking behaviors that require physical courage or actions that bring about a violation of rules, in some cases even leading to death (5,6).

Risky behaviors can be divided into four different groups under the headings of traffic, sexuality, substance use, and sports (6). Committing crimes, smoking cigarettes, alcohol or substance consumption, energy drink consumption and self-harming behavior, attempting suicide, risky driving (driving under the influence of alcohol, without a safety belt, speeding, driving without a license), early sexual experiences, unprotected gender, running away from home or school, dropping out of school, disinterest in classes, unhealthy eating patterns, dieting and a physically inactive life can be considered as risky behaviors (1,4,7-9). Self-harming behaviors, which are generally seen throughout the world between the ages of 13-19, and in our country between the ages of 16-20, are described as destructive behaviors without the intention of ending one's life, seeking to escape negative feelings or deal with

emotional stress factors (10-12). Studies conducted on both self-harming behavior and suicide show that youths in particular are in a high-risk group (13).

The fact that the highest incidence of emergency room admission due to suicide attempts in our country is found in the age group 16-24 is an important piece of information (13-15). Researches on risky behavior, finding has showed that while women experience higher rates of self-harming behavior and suicide attempts, men more frequently become engaged in substance use, violence, early sexual activity, and suicide (4,13,16-20). Studies conducted with university sample groups focus more specifically on risky sexual behavior, particularly sexual activities without the use of condoms (21-24). In addition to unprotected gender, sexual experiences with a high number of partners, gender in exchange for money, as well as the use of illegal substances during or before sexual activities are all considered as risky sexual behavior (24-27).

The influence of friends remains a key factor in health-related risky behavior, which include the consumption of substances such as cigarettes, alcohol and energy drinks. These substances can be suggested by an individual's circle of friends and their use by peers may lead to consumption due to the desire to feel as a member of that group or due to peer pressure (28,29). Particularly cigarettes and alcohol that are tried during adolescence can lead to a transitional consumption of marijuana and other substances in later years, increasing a tendency towards the use of illegal substances (29). It is here that the university years play an influential role as a time during which different experiences with substances may occur. The consumption of energy drinks, which are popular among young people, pose a risk in terms of excessive alcohol and substance consumption (7,30) as they cause an increased release of dopamine, serotonin, noradrenaline and adrenaline, in addition to their prolonging the effects of these chemicals (31).

It is established that risky behavior may accumulate in individuals and that a youth with one risky behavior then has a tendency for other risky behaviors (4). According to research that supports this relationship, there is a link between illegal substance use and health-related risky

behaviors, risky sexual behaviors (32-34), risky driving (35), risky financial behaviors and gambling (36-38), engaging in fights and sustaining injuries, and carrying sharp and piercing weapons (39-41).

In recent years, there has been a rise among university students in engaging in risky behavior and substance use. This study aims to assess the prevalence of risky behaviors among university students and evaluate the relationship between risky behaviors and substance use. The basic hypothesis of this study is that there is a relationship between substance use and the following risk-taking behaviors: suicide attempts, self-harming behaviors, carrying sharp and piercing weapons, fighting and sustaining injuries as a result of fighting, engaging in early sexual experiences and unprotected gender.

## METHOD

Power analysis was utilized in the calculation of the sample size. In the scope of this study, calculations were made based on the prevalence of illegal substances (0.01%-0.6%), which are in the focus of this study; power analysis was utilized with substances with the lowest prevalence of use (heroin, cocaine, ecstasy, volatile substances etc.) according to studies conducted in universities in Turkey (9,42). Accordingly, a sample size of 3,184 individuals with a deviance of  $\pm 0.03$  and a 95% confidence interval for a setting in a university with 53,003 students was found sufficient. A total of 4,307 individuals aged between 17 and 35 years participated in a year-long survey. As a reliability question, a non-existent substance dubbed "relaktin" was included. The 325 participants who answered "yes" to the use of "relaktin" were removed from the assessment and a sample of 3,982 remained. The findings of 2,973 individuals who completed all of the questions were included in the final assessment.

## Measures

The demographic data form includes gender, age, school, academic success, family and cohabitant information of the participant, and financial status of the individuals included in the study.

**Addiction Profile Index - short form (API – short):** The Addiction Profile Index (API) short form, which was prepared by Ogel et al. (43), features risky behavior such as the consumption of cigarettes, alcohol, and substance use frequency, early sexual activity, suicide attempts, physical fighting, sustaining injuries as a result of fighting, gashing one's body and other forms of self-harm, carrying a knife, a gun, or similar weapons, an unhealthy lifestyle and unhealthy internet usage, as well as questions based on psychological evaluations such as depression, anger, anxiety, impulsivity and sensation-seeking. The Cronbach alpha co-efficient of the scale is 0.89. The item-total score correlation coefficients have been determined to be between 0.49 and 0.70. Two factors have been obtained in the explanatory factor analysis, explaining 60.3% of the total variance. Addiction diagnosis scales and questions pertaining to strong desire have been gathered under the first factor, while influence on life and motivation have been gathered under the other factor. The correlation co-efficient between BAPI-short and BAPI has been found to be 0.96, while this figure was 0.82 for AUDIT and 0.76 for CAGE. All correlations were statistically significant at the level of  $p < 0.05$ .

## Application

The study was approved by the Ethics Committee (Decision no. 2037). The survey was entered into the university database and was administered as a web-based study. All units were sent a formal notification in writing prior to the study, posters were placed on campus to encourage participation, and the survey was announced on the websites and social media pages of the university and its organizations. The survey, which was conducted online, was based on voluntary participation. First names, last names, student numbers and similar personal information were not gathered from students. The survey was prepared so that one could not proceed with the questions before completing the previous question; however, participants could withdraw from filling in the questionnaire at any point they desired.

## Statistical Analysis

The analysis utilized frequency, the Pearson chi-square and regression tests. Pearson chi-Square test was used in order to evaluate the categorical data and determine the difference between groups. At the analysis stage, sets of four or five Likert-type scale answers were transformed into two or three sets in order to help with the assessment. All substances (tranquilizing medication, hallucinogens, ecstasy, heroin, cocaine, narcotic drugs, and volatile substances) which were inquired about from students in this study were combined and evaluated together as "substance experience." The logistic regression test was used in evaluating the effect of independent variables on the dependent variable, which was

substance use. The binary logistic regression analysis was used with the enter method in order to obtain the distinctive effect of each risky behavior in substance use. The statistical significance level of the study was chosen as  $p < 0.05$ .

## RESULTS

### Sociodemographic Results

Of the participants in the study, whose average age was  $21.8 \pm 2.9$  (min: 17, max: 35), 1,629 were women (54.8%) and 1,344 were men (45.2%). While 78.8% ( $n=2,343$ ) of the participants represented faculties, 6.1% ( $n=181$ ) represented colleges, 8.9% ( $n=264$ ) vocational colleges and 6.2% ( $n=185$ ) represented

**Table 1: The prevalence of risky behavior according to sex**

	General %	Women %	Men %	$\chi^2$	p
<b>Plans or attempts of suicide</b>	24.8	27.9	21.2	18.335	<0.001
<b>Self-harming behavior</b>	15.4	17.8	12.5	15.887	<0.001
<b>Carrying sharp, piercing weapons</b>	13.7	10.2	18.0	37.993	<0.001
<b>Involvement in a fight in past year</b>	16.8	11.0	23.8	85.706	<0.001
<b>Sustaining injury due to fight in past year</b>	5.2	2.9	7.9	35.594	<0.001
<b>Sexual relations experience</b>				374.746	<0.001
No sexual activity	58.7	73.5	40.7		
Before the age of 15	1.5	0.6	2.6		
Between ages 15-18	13.4	5.4	23.1		
After the age of 18	26.4	20.4	33.6		
<b>Protection method during sexual relations</b>				74.070	<0.001
No method	6.9	5.3	7.8		
Coitus interruptus	27.5	35.0	23.5		
Birth control pill	6.1	12.3	2.8		
Condom	59.4	47.3	66.0		
<b>Cigarette experience</b>				106.410	<0.001
Never	45.7	52.9	37.1		
1-2 times	18.5	19.0	17.9		
Once a month	6.1	5.8	6.5		
A few times a week	5.5	4.6	6.6		
Everyday	24.2	17.8	31.8		
<b>Alcohol experience</b>				116.593	<0.001
Never	23.8	26.2	20.9		
1-2 times	13.8	15.9	11.2		
A few times a month	46.2	48.1	43.9		
A few times a week	13.8	8.5	20.2		
Everyday	2.4	1.3	3.8		
<b>Energy drink experience</b>	31.9	23.0	42.7	147.024	<0.001
<b>Substance experience</b>				69.589	<0.001
Never	72.8	76.9	67.9		
1-5 times	19.6	19.2	20.2		
More than 5 times	7.6	4.0	11.9		

$\chi^2$ : Chi-square

postgraduate institutes. Of the students, 15% (n=445) were in their preparation year, 25.9% (n=770) in their first year, 20.3% (n=604) in their second year, 13.9% (n=413) in their third year, 13.5% (n=402) in their fourth, fifth and sixth years and 8.8% (n=262) were pursuing a graduate degree or doctoral thesis. Among the participants, 84% noted that their mother and father were still together; 9.9% indicated that their parents were divorced and 6.1% said that they had lost at least one parent. Of the participants, 39.2% lived with their families; 2.2% with a relative; 34.5% alone in a home, with their friends or their significant other; 22% indicated that they were staying in a dormitory while 2% said they had an alternate living arrangement.

### The Prevalence of Risky Behaviors

When risky behaviors were assessed based on gender, women were found to experience higher rates of planning and attempting suicide ( $\chi^2=18.335$ ;  $p<0.001$ ) as well as self-harming behavior ( $\chi^2=15.887$ ;  $p<0.001$ ) while men experienced significantly higher rates of carrying knives, penknives, weapons and sharp, piercing objects ( $\chi^2=37.993$ ;  $p<0.001$ ), in addition to involvement in a physical fight within the last year ( $\chi^2=85.706$ ;  $p<0.001$ ); having sustained an injury as a result of fighting ( $\chi^2=35.594$ ;  $p<0.001$ ) and early age sexual experiences ( $\chi^2=374.746$ ;  $p<0.001$ ). While there was a relationship determined between protection methods during sexual activities and the gender factor ( $\chi^2=74.070$ ;  $p<0.001$ ); condom use was reported more frequently by men, while birth control pills and coitus interruptus were cited by women as the most popular forms of protection (Table 1).

The lifetime use of the following at least one time was found among the students: cigarettes 54.3%, alcohol 62.4%, energy drinks 31.9% and a substance (any kind of sedative medication that is not prescribed, marijuana, ecstasy, heroin, cocaine, narcotic medication, volatile substances) 27.2%. Consumption was categorized by frequency between 1-5 times (19.6%, n=584), and more than five times (7.6%, n=225).

There were significant differences found between the gender regarding the frequency of cigarettes ( $\chi^2=106.410$ ;  $p<0.001$ ), alcohol ( $\chi^2=116.593$ ;  $p<0.001$ ), energy drinks ( $\chi^2=147.024$ ;  $p<0.001$ ) and substance use ( $\chi^2=69.589$ ;  $p<0.001$ ) (Table 1).

### The Relationship Between Risky Behaviors and Substance Use

The study examines the prevalence of risky behaviors and the effects of the frequency of risky behaviors on substance use. The assessment was conducted in groups who never use substances (n=2164) and those who consume substances (those who have used substances more than five times) (n=225). Logistic regression analysis was used for the effect of each risky behavior on substance use. It can be seen that the frequent attempt or planning of suicide, self-harming behavior, carrying sharp or piercing objects, having been involved in a physical fight in the last one year or having received an injury in a fight all correlate to an increased risk of substance use (Table 2). In sexual experience, having experiences prior to the age of 15, within the 15-18 age range and after the age of 18; in the case of sexual activities, the technique of coitus interruptus (an ineffective protection method), the use of condoms or the birth control pill (effective protection methods) and using no form of protection during sexual relations correlate to an increased risk of substance use as compared to those who have no sexual experience. As the frequency of consuming cigarettes, alcohol and energy drinks increase, so does the use of substances (Table 2).

According to Table 2, the use of substances is over eight times higher in those who frequently plan suicide, have sexual experiences prior to the age of 18, use the coitus interruptus method during sexual relations, smoke every day, consume alcohol every day or 1-5 times a week, and consume an energy drink 1-7 times a week.

### DISCUSSION

Our findings demonstrate that suicide attempts, the carrying of sharp and piercing objects, the consumption

**Table 2: The effect of risky behaviors on substance use**

Risky behaviors	Odds Ratio	95% Confidence Interval	Wald
<b>Plans or attempts of suicide</b>			
Occasional planning and attempting	2.227	1.639-3.025	26.229
Frequent planning and attempting	11.364	5.774-22.365	49.502
<b>Self-harming behavior</b>			
Carrying sharp, piercing objects	3.498	2.549-4.799	60.187
A physical fight within the last year	3.892	2.843-5.329	71.859
<b>A physical fight within the last year</b>			
One physical fight	2.701	1.854-3.936	26.765
Two or more physical fights	5.955	3.932-9.018	71.009
Sustaining injury due to a physical fight within the last year	4.577	2.933-7.144	44.847
<b>Sexual relations experience</b>			
After the age of 18	4.904	3.439-6.992	77.144
Between ages of 15-18	10.067	6.871-14.749	140.425
Before age of 15	16.602	7.477-36.865	47.647
<b>Method of protection during sexual relations</b>			
No method used	4.939	2.389-10.213	18.570
Coitus interruptus*	9.269	6.193-13.872	117.142
Condom, birth control pill**	5.928	4.198-8.373	102.086
<b>Cigarette experience</b>			
One to 2 times in life	3.341	1.996-5.593	21.058
A few times a month	5.202	2.670-10.133	23.490
A few times a week	4.805	2.381-9.697	19.194
Everyday	15.853	10.444-24.065	168.382
<b>Alcohol experience</b>			
Only once	2.208	1.111-4.388	5.113
One to 3 times a month	3.416	1.984-5.882	19.635
One to 5 times a week	16.376	9.357-28.657	95.878
Almost everyday	39.625	18.831-83.380	93.966
<b>Energy drink experience</b>			
One to 3 times a month	3.800	2.825-5.110	77.911
One to 7 times a week	8.560	5.121-14.308	67.086

\*Non-effective protection method, \*\*Effective protection method, Odds Ratio: Relative Risk

of cigarettes, alcohol and substances, as well as unprotected gender are more prevalent in university students in Izmir, compared to other studies conducted in Turkey, and that there is a relationship between risky behavior and substance use.

### The Prevalence of Risky Behavior

Our study found that the incidence of planning and attempting suicide (24.8%) in university students is higher than the findings of other studies conducted in Turkey (suicide thoughts 11.4%-42%, suicide attempts 5.5%-7%) (13,44,45). In studies conducted in other countries, the prevalence of thoughts of suicide were found to be 24%, suicide attempts varied between 5 and 18% (11,46-49). Regardless of the fact that our findings show a higher prevalence than at other universities in Turkey, we hold that the thought, planning, or attempt of suicide are different terms, and our inclusion of the

two different terms of suicide planning and suicide attempt in the same question may have affected the results. The finding of a prevalence of self-harming behavior (15.4%) to be at the same percentage as in a different study conducted in 2011 demonstrates that a consistent result has been attained (45). In studies conducted in different countries, we see that self-harming behavior is generally more prevalent and reaching higher numbers particularly in the United States (69%), Canada (41%), Australia (47%), and Indonesia (32.7%), while this rate is lower in European countries such as England (14%), Italy (21%), and Germany (6%) (11,49). The difference in these countries may be due to legal regulations, socio-cultural infrastructure, social acceptance based on self-destructive harm, and differences in religious beliefs. Our finding of high rates of suicide attempts and self-harming behavior among women is consistent with the approach of cultural differences and many studies (49-53); however, there are some studies

which indicate that there is no difference regarding gender in this matter (13,45). The gender-based differences found in the literature may be due to the respective research methods being utilized. The reason for the findings of higher rates of attempted suicides in women and successful suicides in men may have to do with the preferred methods of suicide. While women generally take pills, men opt for fire weapons in trying to take their own lives, choices affecting the outcome of suicide attempts (53).

The fact that our study found the rate of university students carrying knives, penknives, guns and similar sharp and piercing weapons (13.7%) to be higher than in other studies in the university population of Turkey (7.9%-11.1%), shows that such behavior is on the rise among students (54,55). Our finding that the rate of injuries sustained as a result of carrying a piercing or sharp weapon and involvement in a fight is higher among men in comparison to women (40,54,56,57) may be explained by social gender roles imposed on men, expecting them to be brave, strong, and to become warriors.

While in Turkey sexual experiences increase during university years, we see that there is an absence of sufficient information regarding sexual protection methods and sexually transmitted diseases (STDs) among university students (58,59). This situation brings about a youth that is more active in sexual life, while not using effective forms of protection, thus creating risky situations. Our study has found the prevalence of unprotected gender (where no form of protection is used, including coitus interruptus) to be 34.4%. This rate is higher compared to the findings of other studies in Turkey (18.9%-27.4%) and similar to findings of studies abroad (34%-48%) (21-24,26,58-60). This finding is an important result which needs to be examined. The lack of information on methods of protection, inadequate experience and the lack of a correct attitude towards sexuality all increase the risk of facing early pregnancy, HIV, and STDs. Because half of the HIV patients and one third of STD cases are youths below the age of 25, university students comprise an important population that needs to be kept under surveillance to this end (61). An important sexually risky behavior is sexual experience at a young age. It

is believed that the difference found in sexual experience before the age of 15 in our study (1.5%) and the findings of a study conducted abroad (40.6%) is caused by our country's cultural values and our perception of sexual experience (62). Turkey's perception of sexuality as a taboo and the fact that this topic is, for the most part, not discussed and rather ignored, in addition to the importance placed on virginity, social and familial pressure regarding sexuality, the fear of becoming pregnant or impregnating, STDs and religious beliefs are all causes leading to the avoidance of sexual activities at a young age (58,63).

The finding in our study that life-long cigarette and alcohol consumption among Izmir university students is higher than that reported in other studies (cigarette consumption 29.1%-43.3%, alcohol consumption 47.9%-55.6%) conducted on Izmir's university students points to the need for an increase in preventative measures for this matter (64-66). Additionally, even though the finding of lower rates of energy drink consumption (31.9%) in our study compared to other studies in Turkey (55.0%-59.9%) and abroad (65%-68%) may appear to be a positive outcome, this does not mean that there is no problem regarding the consumption of such drinks (30,67-69). Another study completed in Turkey points out that despite the rate of energy drink consumption being 55%, the percentage of persons with inadequate knowledge about energy drinks is 73%, highlighting unawareness in the uninformed consumption of this product (67). The probability of the threat that may be posed by uninformed consumption in the future needs to be considered. It is expected that the consumption of energy drinks among youths will continue to increase, with the marketing strategy for these beverages targeting young people, physical endurance, sexual bravery, and extreme sports (69,70).

The rates of substance use in Turkey among university students have been found in the range of 6.0%-8.6% between 1990-2003 (71-74), 3.0%-9.2% (42,55,75,76) between 2004-2009, and 4.7%-13.6% between 2010-2015, demonstrating that consumption is on the rise with each passing year (3,65,68,77,78). In

addition to this, our study reveals that substance use affects a high percentage of people. This difference may have to do with variance in research methods, the difference in scales that assess the prevalence of substance use, and the fact that for the purposes of our study, sedatives which are used without a prescription and which may lead to a substance use problem were also evaluated under the category of "substance use." Furthermore, the 2013 report of the Turkish Monitoring Center for Drugs and Drug Addiction (TUBIM), which includes a statistical finding that the regions of Marmara and Aegean have the highest prevalence in marijuana-related incidents, with a total of 33,500 drug users being reported for Izmir according to data for 2011, seems to confirm this situation (79). Our study found that the consumption of cigarettes, alcohol, energy drinks, and substances is significantly more prevalent among men than among women, which is consistent with other studies in the literature pertaining to the gender role in this matter (3,5,39,66,77,80,81). Additionally, our study found that the trial of substances was similar in men and women (consumption of 1-5 times), but a difference was found in the continued consumption (more than five times). This finding, in addition to the demonstrated fact that men are at a higher risk regarding the regular consumption of substances, points to an increasing interest in and experience with substance use by women.

### **Relationship Between Risky Behavior and Substance Use**

The finding in our study of an increased risk of substance use among people with frequent plans or attempts of suicide, or those with self-harming behavior, appears to demonstrate the relationship between self-harming behavior and substance use. It is frequently noted that the use of drugs and substances plays a causal role in thoughts and attempts of suicide (82) and that psychological illnesses and substance use are at the core of self-harming behavior (12,83,84). Our study demonstrates that there is a higher risk of substance use among those who engage in physical fights and carry piercing or sharp weapons. In studies completed in the United States, results were found to demonstrate

a strong relationship between carrying a gun on campus and substance use, as well as substance sales and substance-related crimes (40,57). An early start of violence and crime may indicate a risk of substance use in later years. Our study shows that early sexual experience increases the risk of substance use by 16.6 times and that among those whose sexual activity begins at an earlier age, substance abuse climbs to a high rate of 37.9%. This confirms the relationship between risky sexual behavior and substance use. It has been pointed out that in addition to the relationship between substance use and risky sexual behavior (60,85,86), substance or alcohol consumption prior to or during sexual behavior is assessed as risky sexual behavior, and an experience based on this may lead to unprotected sex (24,26). Opinions have been formulated on the increasing prevalence of marijuana consumption in Africa and how this is tied to risky sexual behavior (32).

Our research has determined that as the consumption of cigarettes, alcohol, and energy drinks increases, so does the risk for substance use. Research indicates that regular smoking of cigarettes and risky (excessive) consumption of alcohol form a risk with regard to the use of addictive substances and may even lead to the consumption of multiple substances (42,87,88). In addition, there is a study finding a higher consumption rate of cigarettes, alcohol, marijuana, and amphetamines among consumers of energy drinks (7).

In the end, risky behavior such as suicide attempts, carrying piercing and sharp objects, consuming cigarettes, alcohol, substance use, and unprotected sexual activity are all increasing with each passing year among university students in Turkey. In some risk-taking behavior, the gender factor continues to maintain its differentiating role. It is evident that self-harming behavior and suicide attempts in particular are more prevalent among women. One important finding is that as the frequency of risky behavior increases, so does the risk of substance trial and use. The noticeably higher rates of substance use among persons who frequently plan suicide, experience sexual relations before the age of 18, have unprotected sex, consume cigarettes every day, and consume alcohol 1-7 time week, as well as those who consume energy drinks demonstrates that there is an increased risk of substance use among those who are engaged in such behavior. The



relationship between risky behavior and substance use confirms the idea that a person who engages in one type of risky behavior may be prone to other ones. As such, it is very important to question substance use in youths who engage in risky behavior and inversely the risky behavior among those who seek aid with a problem pertaining to substance use.

One of the strongest aspects of the study is its well-planned research method. The setting of the study was kept wide, including students from pre-bachelor, bachelor, and post-bachelor programs from all units, including faculties, the postgraduate institute, colleges, and vocational colleges making up the university in central Izmir and surrounding towns in the remit of the study. The online administration of the study worked to increase participation. As it was thought that the virtual world would be perceived as more anonymous by young people, even those who do not actively attend classes were reached out to. Additionally, a question pertaining to a non-existent substance named “relaktin” was used as a reliability question, leading to the removal of 325 people who noted they had tried this substance, thereby increasing the reliability of the study and allowing for more accurate findings. Furthermore, a system that did not allow for questions to be skipped was implemented, thereby preventing the loss of data.

One of the limitations of this study was the lack of detailed information obtained on risky behavior. It was thought that asking and evaluating the age at

which each risky behavior began would eliminate the uncertainty regarding the two-way relationship between risky behavior and substance use. Furthermore, conducting a cohort-type research on determining the direction of this relationship will increase the strength of similar studies. Another restriction was the use of self-assessment-based data for analysis. It is believed that this may have led to an insufficient evaluation due to incomplete statements. Additionally, our sample is composed of the students of only one university in Izmir. The inclusion of different universities in different regions will increase the study’s generalizability for the whole of Turkey.

Contributions category	Authors name
Development of study idea	A.E.A.
Methodological design of the study	A.E.A.
Data acquisition and process	D.H.A., A.E.A.
Data analysis and interpretation	D.H.A., E.A.
Literature review	D.H.A.
Manuscript writing	D.H.A., E.A.
Manuscript review and revision	E.A.

**Acknowledgement:** We would like to thank Professor Kultegin Ogel for his contributions to the research idea and method in the context of the Genciz Project.

**Conflict of Interest:** Authors declared no conflict of interest.

**Financial Disclosure:** Authors declared no financial support.

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