

# Suicide Risk in College Students: The Effects of Internet Addiction and Drug Use<sup>\*</sup>

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## Abstract

This study aims to identify the factors in suicide risk among college students by examining the direct and indirect effects of drug use, internet addiction, gender, and alcohol use on suicide risk. The sample of the study is composed of 975 students studying at different faculties of Ahi Evran University during the academic year 2011–2012. They were selected through convenience sampling. This study used the University Form of Risk Behaviors Scale and Internet Addiction Scale as the data collection instruments. A path analysis was conducted to view the effects of independent variables on suicide risk. Results showed that college students' suicide risk is predicted by drug use and Internet addiction; and while gender and alcohol use do not have a direct significant effect on suicide risk, their indirect effects are significant. According to these results, suicide risk in university students is predicted by other risk behaviors. Thus, the importance of demonstrating the causal relationship between risk behaviors is discussed in the light of literature.

**Keywords:** College students • Suicide risk • Drug use • Internet addiction • Path analysis

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In Turkey, 788 young people aged between 15 and 24 years committed suicide in 2012, and 417 of these young people were college-aged (Türkiye İstatistik Kurumu [TÜİK], 2013). College life signifies a period in which one prepares for both a profession and social life as an adult. Some traumas resulting from adolescence are resolved and some major goals for future life are clarified during this time. Therefore, the college years can be seen as a challenging period in which compulsive behavior is likely youths are faced many difficulties.

Suicide is an act of aggression against oneself, and the intentional extermination of one's own life. It is defined as "all cases of death resulting directly or indirectly from a positive or negative act of the victim himself, which he knows will produce this result" (Durkheim, 1992). Suicide is reported as the second-most-common cause of death for college students (Taub & Thompson, 2013). College students at risk for suicide can be classified into two broad groups: those who come to college with a diagnosis of a psychological disorder, those who first experience affective disorders during their college education. According to the Suicide Prevention Source Center (2004), leaving home and progressing to university can exacerbate an existing emotional problem or trigger a new one. College students' mental health is likely to deteriorate when bad sleep habits, drug use or experimentation, and alcohol use and abuse are combined with academic and social stress (as cited in Taub & Thompson, 2013). A study by Ceyhan and Ceyhan (2003) concludes that suicide risk among college students is quite high.

Factors leading to increased suicide risk in college students and others can be categorized as biological, psychological, or socio-cultural. Alcohol and drug use are seen as important risk factors for suicidal behavior (Sue, Sue, Sue, & Sue, 2013), along with hopelessness and depression (Arria et al., 2009). This view is also supported by various other studies on the subject. Previous alcohol use and attendance at events where alcohol is used are also linked to suicide attempts (Schaffer, Jeglic, & Stanley, 2008). Alcohol abuse is also a predictor of suicide ideation in college students. A study by Brener, Hassan, and Barrios (1999) concludes that a relationship exists between drug use and suicide ideation in college students. Another study concludes that drug use in youth leads to increased suicidal ideation and behaviors (Felts, Cherner, & Barnes, 1992). A similar study with teenage boys of different ethnic origins concludes that psycho-active drug use is connected with suicide attempts in all groups of

teenagers, and cocaine and heroin use are connected with suicide attempts in Hispanic adolescents (Vega, Gil, Warheit, Apospori, & Zimmerman, 1993). Consistent with the results of these studies, several other studies in the literature conducted with the individuals between 15 and 24 have identified a relationship between suicidal behaviors (suicide ideation, suicidal tendencies, suicide risk, suicide attempts, and suicide itself) and alcohol and drug use (Borowsky, Ireland, & Resnick, 2001; Field, Diego, & Sanders, 2001; Hallfors et al., 2004; Karamustafaoglu et al., 2010; Morris et al., 1995; Remafedi, Farrow, & Deisher, 1991; Shamsian, 2001; Wichstrom, 2000; Yalçın, Eşsizoglu, Akkoş, Yaşan, & Gürgen, 2009). Based on these findings, it can be concluded that the abovementioned risk behaviors are not independent from each other, and risk behaviors bring about other risk behaviors. Therefore, it is important to examine the relationship between risk behaviors.

Internet addiction can be seen as an important risk area as it has been seen frequently among college students in recent times. It cannot be ignored the positive effects of the internet on youth, but problematic Internet use and/or Internet addiction is a crucial and increasing problem (Bozoğlan, Demirel, & Şahin, 2013; Li, O'Brien, & Snyder, 2015; Niemz, Griffiths, & Banyard, 2005; Şahin, 2014; Şahin, Özdemir, & Ünsal, 2013). Although it does not have definitive criteria for diagnosis or assessment as do other types of addiction, the term "Internet addiction" has been used to define unhealthy and uncontrolled use of the Internet (Beard, 2005). Basic symptoms of Internet addiction are excessive use, depressive emotions, tension and anger when the internet is unavailable, the deterioration of social relations, and a decline in academic or job performance (Young, 2004). Besides these negative situations, Internet addiction can have a range of effects on risk situations involving youth. Ceyhan (2008) thus argues that Internet addiction is a risk factor in the mental health of youth.

In particular, Internet-addicted persons are reported to have more suicide ideation (Kim et al., 2006). Similarly, a strongly positive relationship holds between Internet addiction, depression, and suicide ideation (Ryu, Choi, Seo, & Nam, 2004). Some studies have also shown that depression and suicide ideation are connected not only with internet addiction but also with its symptoms (Fu, Chan, Wong, & Yip, 2010). An analysis of the Youth Risk Behavior Survey showed a relationship

between internet use, video games, and suicide ideation in youth (Messias, Castro, Saini, Usman, & Peebles, 2011). Thus, internet addiction can be seen as an important factor in predicting suicide risks among youth. Therefore, it seems important to identify clearly the relationships between Internet addiction and suicide risk and the other risk behaviors from a multidimensional perspective.

Thus, it is aimed to examine the extent to which college students' suicide risk is directly or indirectly affected by alcohol use, drug use, and Internet addiction. This study also investigates the role of gender in alcohol use, drug use, internet addiction, and suicide risk. While completed suicides are more common among men, suicidal tendencies are more common among women (Lee & Tsang, 2004; Turgay, 1992). Although women are thought to bear more suicide risks because of their predisposition to depression and anxiety disorders (Kearney & Trull, 2012), the predictors of suicide risk for both genders are different. Stephenson, Pena-Shaff, and Quirk (2006) found that while suicide ideation in female college students is predicted by alcohol use and sexual harassment, that of male students are predicted by exposure to physical assault. Another study on college students showed that suicidal tendencies in female students stem from internal events, while those of male students stem from events related to success (Waelde, Silvern, & Hodges, 1999). Therefore, the effects of gender were included in our study because it is important to identify the direct and indirect effects of gender on suicide risk.

Alcohol use is higher among male college students than females (Buğdaycı, Şaşmaz, Ayaç, & Çamdeviren, 2003; Çamur, Üner, Çilingiroğlu, & Özcebe, 2007; Engs & Hanson, 1990; O'Malley & Johnston, 2002; Turhan, İnandı, Özer, & Akoğlu, 2011). Drug use is also higher among male college students (O'Malley & Johnston, 2002; Pirinççi & Erdem, 2004; Siyez, 2009; Tot et al., 2002; Yiğit & Khorshid, 2006; Yıldırım, 1997); some studies have concluded that masculinity is a risk factor for drug use (Görgün, Tiryaki, & Topbaş, 2010; Yalçın et al., 2009).

Likewise, several studies have confirmed that Internet addiction is higher among men than among women (Batgün & Kılıç, 2011). Crucially, men use the Internet more than women (Bimber, 2000), but women are online for longer periods than men (Ono & Zavody, 2003). Weiser (2000) argued that reasons for using the Internet differ for men and women. However, some studies have shown that levels of Internet addiction do not differ by gender (Kim et al., 2006).

Görgün, Tiryaki, and Topbaş (2010) state that drug use is higher among college students who had previously smoked and used alcohol. Other studies reported that a significant portion of drug-using students use alcohol as well; therefore, students with a chemical-using habit are likely to become addicted to other substances (Yıldırım, 1997). Furthermore, drug use has a possible intermediary effect between alcohol use and suicide risk (Pompili et al., 2010).

Finally, this study aims to identify the extent to which college students' suicide risk is predicted by gender, alcohol use, drug use, and internet addiction; and to what extent their suicide risk increases by gender and alcohol use through the agencies of drug use and Internet addiction. Ascertaining the multidimensional causal relationships between risk behaviors is important for prevention programs. In the literature on college students' suicide risk, psychological characteristics are often examined. However, few studies have examined the multidimensional relationships between the different variables. This study aims to investigate how previous risk factors for suicide risk affect each other and how they jointly increase suicide risk in college students. This can make a significant contribution to the existing knowledge for practitioners and researchers in the field. According to Öksüz and Bilge (2014), suicide rates are increasing gradually among college students, so prevention initiatives by professionals of psychology, psychological counseling, and other relevant fields are becoming increasingly important. If risk behaviors with the fewest negative impacts are prevented, the negative impacts related to other risk areas can thus be prevented. Moreover, understanding the causal relationships between the variables in this study can provide information for mental health specialists helping those at risk for suicide.

## Method

### Research Design

A relational survey model was used for this study. The explanatory and predictive relationships between suicide risk of college students and predictor variables (gender, alcohol, drug use, and internet addiction) are investigated through path analysis. According to Bayram (2010) path analysis serves to investigate the relationship networks among observed variables.

## Participants

Based on the aim of the study and the analysis, convenience sampling is used in this study. The sample of our study comprised 975 students studying at different faculties of Ahi Evran University in the 2011–2012 academic year. 258 (26.5%) of these students studied in the Faculty of Science and Letters, 99 (10.2%) in the Faculty of Agriculture, 143 (14.7%) in the Faculty of Economics and Administrative Sciences, 99 (10.2%) in the Physical Medicine and Rehabilitation, 195 (20%) in the Vocational Health College and 181 (18.6%) in the School of Physical Education and Sports. 594 (60.9%) of these students were female, and 381 (39.1%) were male. Distribution of these students according to their grades is as follows: 417 (42.8%) of them were in the first year, 281 (28.8%) in the second year, 144 (14.8%) in the third year, and 133 (13.6%) in the fourth year.

## Data Collection Tools

For data collection tools for this study, it is used the University Form of Risk Behaviors Scale (Gençtanırım, 2014) and the Internet Addiction Scale (Bayraktar, 2001). In addition, it is asked participants a series of questions to obtain information about their gender, grades, and areas of study.

**University Form of Risk Behaviors Scale (UFRBS):** This scale was developed to evaluate risk behaviors in college students. It assumes the explanations of Problem Behavior Theory on risk behaviors and was based on the Risk Behaviors Scale<sup>®</sup> (Gençtanırım-Kuru, 2010) developed for high school students. This scale examines such dimensions as antisocial behaviors, smoking, alcohol use, drug use, suicide risk, feeding habits, and dropping out. It includes 60 items scored on a five-level Likert scale. All items are equally weighted. The scale has a separate score for each dimension. High scores in a dimension indicate increased risk in that dimension. Exploratory and confirmatory factor analyses were conducted to ensure the validity of this scale. Exploratory factor analysis showed the total variance of the scale to be 52.38%. Item factor loadings ranged from .34 and .90 according to the results of our exploratory factor analysis (Gençtanırım, 2014).

In our study, suicidal tendencies (ST), alcohol use (AU), and drug use (DU) were used as the sub-dimensions of this scale. There were 12 items with factor loadings between .47 and .73 for suicide risk (tendency); nine items with factor loadings

between .59 and .83 for alcohol use; and nine items with factor loadings between .56 and .83 for drug use. Confirmatory factor analysis showed that item factor loadings varied between ( $\lambda$ ) .60–.88 for alcohol use; ( $\lambda$ ) .55–.81 for suicide risk (tendency) and ( $\lambda$ ) .57–.89 for of drug use. In addition, the model fit indices were at acceptable levels.

From the reliability analyses conducted while developing the scale, Cronbach's alpha values of internal consistency were  $AU = .90$ ,  $ST = .89$ , and  $DU = .90$  for suicide tendencies, alcohol use, and drug use, respectively. The reliability of the scale was measured with the test-retest method as well: Pearson's correlation ( $r$ ) coefficients were  $AU = .98$ ,  $ST = .74$ , and  $DU = .97$  (Gençtanırım, 2014). Cronbach's alpha coefficients for internal consistency of the relevant sub-dimensions were calculated as  $AU = .93$ ,  $ST = .91$ , and  $DU = .95$ .

**Internet Addiction Scale (IAS):** The Internet Addiction Scale is a Likert-type scale based on an adaptation of the "Pathological Gambling" criteria of DSM-IV (Young, 1998). It has 20 items graded between 1 and 6. Its score range is 20–180, with high scores indicating high levels of internet addiction. This scale was translated into Turkish by Bayraktar (2001) in the Turkish Republic of Northern Cyprus (TRNC). The Cronbach's alpha coefficient for its internal consistency was .91. In the adaptation study, the results show the model is significant for Turkish sample ( $f(11.29) = 26.15$ ,  $p < .01$ ). For the data set used in our study, the Cronbach's alpha coefficient for the internal consistency of this scale was .94.

## Procedure

It is obtained the necessary permissions from the university for data collection and the data were carried out by the researcher. Students were informed about the purpose and subject of the study, and data were collected through volunteer participation by students. Data collection was conducted during class time with the support of lecturers. Before analysis, Pearson's correlation coefficients between the variables were computed. A path analysis was conducted to determine the effects of independent variables on dependent variables. The data were analyzed using AMOS. The gender variable in the model was expressed as male = 1 and female = 0, and was defined as a dummy variable. In addition, the intermediary effects in the model were examined in terms of their significance through the Sobel Test.

Table 1  
Pearson's Correlation Coefficients between the Variables in the Path Model, Average and Standard Deviation Values of the Variables and Their Coefficients of Internal Consistency (Cronbach's Alpha) ( $n = 975$ )

Variables	$\bar{X}$	ss	A	Pearson correlation coefficients			
1. Gender (Male)				1			
2. Suicide Risk	22.33	8.98	.91	.07			
3. Alcohol Use	14.91	5.91	.93	.38**	.19**		
4. Drug Use	11.52	8.65	.95	.25**	.40**	.32**	
5. Internet Addiction	20.16	20.16	.94	.20**	.27**	.19**	.42**

\*\*  $p < .01$  and \*  $p < .05$ .

### Results

Pearson's correlation coefficients between the variables, coefficients of internal consistency (Cronbach's alpha), and average and standard deviation values of the variables are shown in Table 1.

The statistical significance ( $p < .001$  and  $p < .05$ ) of the correlation coefficients between the variables showed that the cause-and-effect relationships foreseen at the outset of this study could be tested with a path analysis. The results of our path model are as follows:

#### Direct Effects

As Figure 1 shows, a 1-point increase in alcohol use leads to a .08-point ( $\beta = .08$ ) rise in suicide risk scores. Standardized regression weights are presented with betas in parentheses ( $\beta$ ). This change is statistically insignificant ( $z = 2.465$ ;  $p = .014$ ). It is found that to be male decreases suicide

risk by  $-1.20$  points ( $\beta = -.07$ ); however, this effect is also statistically insignificant ( $z = -2.042$ ;  $p = .041$ ). On the other hand, a 1-point increase in drug use leads to a .51-point increase in suicide risk. This effect is statistically significant ( $z = 10.185$ ;  $p < .001$ ) and demonstrates that drug use leads to an increased suicide risk. A 1-point increase in Internet addiction was found to lead to an increase in suicide risk by .07; this effect is statistically significant ( $z = 3.910$ ;  $p < .001$ ). In addition, a 1-unit increase in alcohol use leads to an increase in drug use of .18 ( $\beta = .27$ ) ( $z = 8.224$ ;  $p < .001$ ) and to an increase in Internet use by .25 ( $\beta = .13$ ) ( $z = 3.942$ ;  $p < .001$ ). These effects are statistically significant. To be male increase internet addiction by 5.34 points ( $\beta = .16$ ) ( $z = 4.770$ ;  $p < .001$ ) and more drug use by 1.86 points ( $\beta = .15$ ) ( $z = 4.735$ ;  $p < .001$ ). These effects are statistically significant.

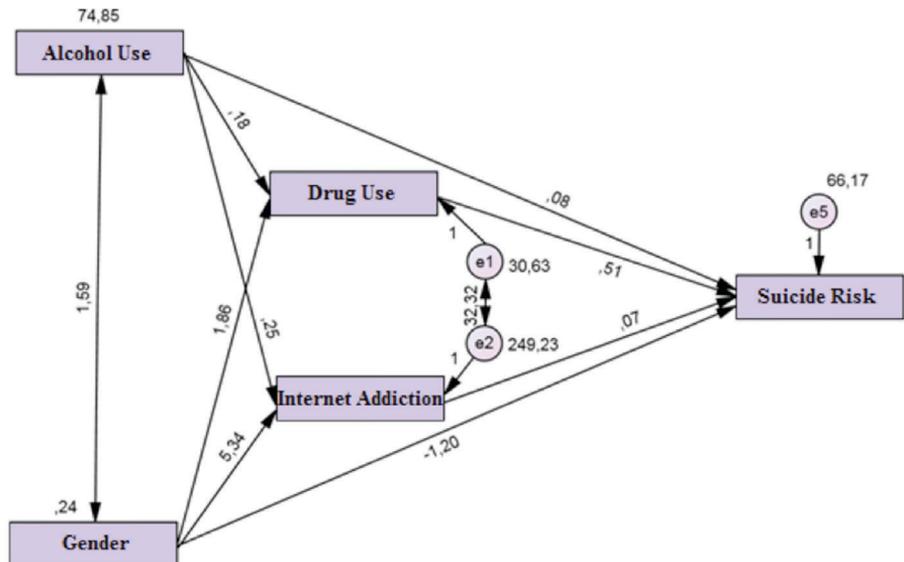


Figure 1: Path model: Unstandardized regression weights.

### Indirect Effects

In this hypothetical model, it is also examined the usefulness of alcohol use and gender as variables in predicting suicide risk through drug use and Internet addiction. It is found that alcohol use does not directly predict suicide risk, but its intermediary effect is significant when its level of predicting suicide risk ( $t_{\text{sobel}} = 6.33; p = .000$ ) through drug use is considered. In other words, alcohol use increases drug use, and this in turn increases suicide risk. The potential for alcohol use to predicate suicide risk through Internet addiction is effectively significant ( $t_{\text{sobel}} = 3.37; p = .000$ ) as well. Thus, Internet addiction is an intermediary variable in suicide risk prediction through alcohol use.

The intermediary effect of gender between drug use and suicide risk was also found significant ( $t_{\text{sobel}} = 4.28; p = .000$ ). To put it another way, suicide risk is higher for male students, who are at greater risk for drug use. The effect of gender on suicide risk through Internet addiction is also significant ( $t_{\text{sobel}} = 3.01; p = .000$ ). Accordingly, male students with high levels of Internet addiction bear more suicide risk. As a consequence, it can be said that drug use and Internet addiction are intermediary variables in terms of gender.

### Discussion

According to the results of this study, drug use is an important predictor for suicide risk among college students. In other words, suicide risk increases in drug-using students. Drug use negatively affects the mental health of youth, and one of these negative effects can be suicide risk. Increased drug use gives rise to psychologically negative traits such as loneliness, depression, and suicidal ideation in youth (Newcomb & Bentler, 1988; McWhirter, McWhirter, & McWhirter, 2004). Due to drug use, young people have troubles in many areas and sever almost all ties with normal life. Our research results are consistent with those of previous studies (Brener et al., 1999; Borowsky et al., 2001; Field et al., 2001; Hallfors et al., 2004; Morris et al., 1995; Karamustafaoglu et al., 2010; Remafedi et al., 1991; Shamsian, 2001; Wichstrom, 2000; Yalçın et al., 2009). Another significant finding is that Internet addiction significantly predicts the suicide risk of college students. According to TÜİK (2013) data, the heaviest internet users in Turkey are between the ages of 16 and 24 and are mostly college-aged. Certain changes in life situations account for the prevalence of Internet usage during this time. Like drug use, Internet addiction is also

known to negatively affect the mental health of youth (Ceyhan, 2008). Several studies have shown that Internet addiction is connected with suicidal behaviors in youth (Fu et al., 2010; Kim et al., 2006; Messias et al., 2011; Ryu et al., 2004). The results of our study confirm the results of previous studies. Moreover, Internet addiction may either accompany the other psychiatric disorders or set the stage for such disorders (Ekşi, 2012). Internet-addicted youngsters may have difficulty fulfilling their academic and social responsibilities and may encounter more tension in their lives. This situation may trigger suicide. For example, a study by Anderson (2010) showed that college students who spend more time on the internet report more life difficulties than their peers who spend less time on the internet. Therefore, life difficulties resulting from internet use and being forced to cope with them can cause suicide risk in college students.

Gender was not a significant predictor of suicide risk. While women are commonly assumed in the literature to be more prone to suicide than men, some recent studies have concluded that suicide risk does not differ by gender (Gençtanırım, 2004; Öksüz & Bilge, 2014). Furthermore, some studies have argued that the dynamics of suicidal behaviors may differ for men and women (Stephenson et al., 2006; Waelde et al., 1999). Therefore, gender does not directly predict suicide risk, but its intermediary effects can be significant. This effect was confirmed by the present study. According to our results, the more male students used drugs and were addicted to Internet, the higher their suicide risk. In this sense, it can be said that gender indirectly increases students' suicide risk.

The direct effect of alcohol use on suicide risk was insignificant, but its indirect effect was significant. In short, alcohol use predicts suicide risk via drug use and internet addiction. Alcohol use causes increased drug use among college students (Görgün et al., 2010; Yıldırım, 1997), and drug use paves the way for suicide risk. The same is true for internet addiction. Alcohol use causes an increase in internet addiction, and internet addiction in turn sets the stage for suicide risk. As a consequence, it can be said that risk behaviors in youth are related to each other, and an increase in one risk area may bring about an increase in another. Suicide prevention programs should consider this point.

The results of this study lead to the conclusion that drug use and internet addiction predict the suicide risk of college students; thus, drug-using students bear higher suicide risk. Suicide risk is likewise higher in students addicted to the internet.

Therefore, the risk factors for drug use should be further investigated along with additional studies on suicide prevention. Services for at-risk students could be made more efficient if mental health specialists, psychologists, and psychological counselors were made aware of the dynamics among drug use, internet addiction, gender, and suicide risk. Such services should be offered more systematically within university bodies, and they should prioritize preventative measures for drug use, internet addiction, and suicidal behaviors. There

is currently a significant increase in the number of university counseling centers being constructed based on items 46 and 47 of numbered 2547 of the Higher Education Act of the Health, Culture, and Sports Department. According to Spencer-Thomas, Sandler, and Jensen (2010), one out of ten college students considers suicide. It is believed that this study contributes to the accumulation of knowledge in the field as it sheds light on the other risks underlying suicide risk in college students.

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