



## Perceived stress, alcohol consumption, and Internet use among Korean college students: Does sensation-seeking matter?

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### ARTICLE INFO

#### Keywords:

Stress  
Sensation-seeking  
Alcohol use  
Internet use  
College students

### ABSTRACT

The drinking culture in South Korea is fairly permissive, and the country is one of the world's fastest growing leaders in Internet connectivity. Given very slim knowledge on the mediating role of sensation-seeking on the association between stress, alcohol consumption, and Internet use among Korean college students, a cross-sectional study was conducted using Structural Equation Modeling on 870 college students (Mean age = 21.9 (SD = 2.4), Males: 65.6%). Sensation-seeking positively mediated between perceived stress level and alcohol use, but no effect on Internet use was found. Findings suggest the need to understand the direct effect of stress on drinking as well as linkages between stress, sensation-seeking, and alcohol consumption.

### 1. Introduction

Harmful alcohol consumption among college students is a worldwide problem, but this problem is particularly salient among Korean college students. > 70% of surveyed Korean college students engaged in binge drinking in the past two weeks (Korean Alcohol Research Foundation, 2010). In contrast, about 40% of U.S. college students were involved in binge drinking in the past 30 days (Substance Abuse and Mental Health Services Administration, 2014). Binge drinking is defined as consuming five or more drinks for men and four or more drinks for women on the same occasion on at least one day in the past month (Wechsler & Nelson, 2001). Problem drinking among college students results in negative consequences, such as higher risk for alcohol use disorders (Blanco et al., 2008), alcohol-related sexual assault, and motor vehicle crashes (Hingson, Zha, & Weitzman, 2009), as well as decreases in academic performance (Wechsler, Dowdall, Maenner, Gledhill-Hoyt, & Lee, 1998).

In addition to problem drinking, Internet addiction is another major issue among emerging adults, including college students (Young, 2015). Korea is one of the world leaders in Internet users and connectivity (McDonald, 2011). The popularity of the Internet is associated with addictive Internet use among Korean young populations (Heo, Oh, Subramanian, Kim, & Kawachi, 2014; Noh & Kim, 2016). It is not surprising that the Korean government implemented various intervention programs for adolescents with Internet addiction (Koo, Wati, Lee, & Oh, 2011).

As Internet addiction is a growing body of research, there is

considerable literature documenting measures of Internet addiction. Most studies used measures based on the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria. For example, Young (2004) developed Internet addiction measures based on criteria for pathological gambling, which is viewed as most akin to the compulsive nature of Internet use. The elements of the diagnostic criteria include dependence (e.g., feel preoccupied with the Internet), withdrawal (e.g., feel restless or depressed when attempting to stop Internet use), tolerance (e.g., use the Internet with increasing amounts of time to achieve satisfaction), and negative consequences (e.g., interpersonal relationship problems, sleep deprivation, job loss, and loss of educational and career opportunities). In 2013, Internet gaming disorder became one of eight conditions for further study in DSM-5 (American Psychiatric Association, 2013).

There can be various reasons for excessive alcohol consumption and Internet use among college students. One of the most common reasons is perceived stress. It is well documented that stress is prevalent among college students. For example, a study indicates that about 90% of college students reported moderate to high levels of stress (Pierceall & Keim, 2007). Consistent with the construct of the self-medication theory of addiction (Khantzian, 1985), college students consume alcohol as an undesirable way to cope with stress (Park, Armeli, & Tennen, 2004; Powers & Kutash, 1985). To make matters worse, stress relief drinking can be a cause of problematic alcohol use and alcohol use disorder (Brady & Sonne, 1999). Blanco et al. (2008) found that approximately one in five college students met the criteria for an alcohol use disorder in the United States. Although it is unclear what

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percent of Korean college students meet DSM criteria for an alcohol use disorder (AUD), it is estimated that there is a higher prevalence of AUD among Korean college students than among U.S. college students. This is because drinking behaviors are very permissive and Korean college students even boast about large alcohol consumption. Additionally, while Internet use may temporarily reduce stress among children and adolescents (Leung, 2007; Tang et al., 2014), the perceived stress level positively predicts Internet addiction among college students (Velezmoraa, Lacedfielda, & Robertib, 2010; Yan, Li, & Sui, 2014).

Previous evidence suggests that the positive links between perceived stress and alcohol and Internet use among college students may be mediated by personality traits such as sensation-seeking, which is a trait defined by seeking varied, novel, complex, and intense sensations and experiences, and readiness to take physical, social, legal, and financial risks for the sake of such experiences (Zuckerman, 1994). Sensation-seeking refers to one's tendency to enjoy or pursue new or exciting experiences, even when the situation contains danger and risk factors (Zuckerman, 1994). Literature on predisposing factors for addiction has shown that sensation-seeking and other personal traits are strong factors in predicting addictive behaviors such as problem drinking (Hittner & Swickert, 2006; LaBrie, Kenney, Napper, & Miller, 2014; Schepis, 2010; Stautz & Cooper, 2013) and Internet addiction (Flores, Siomos, Stogiannidou, Giouzevas, & Garyfallos, 2014; Lin & Tsai, 2002; Yan et al., 2014). In addition, it is possible that a high level of perceived stress in college life can be associated with a high level of sensation-seeking as a means of relieving stress. For example, Smith, Ptacek, and Smoll (1992) reported that low sensation seekers had poorer stress management skills. In sum, prior research has supported the possible mediating roles of sensation-seeking on the association between perceived stress and such addictive behaviors. Peach and Gaultney (2013) reported that sensation-seeking positively mediated the effect of bedtime delay (equivalent to perceived stress) on the likelihood of engaging in delinquent behaviors (equivalent to addictive behaviors) in a national sample of U.S. adolescents, emerging adults, and adults.

Although the above-mentioned studies made contributions to the body of research in the areas of college students' problem behaviors, gaps in the literature still remain. First, there is a lack of evidence examining the mediating roles of sensation-seeking on the relationship between perceived stress and alcohol consumption and Internet use. Most studies examined direct associations either between stress and alcohol consumption/Internet use, or between sensation-seeking and such behaviors. College students are often faced with temptations to experiment with various addictive behaviors as a means of coping stress. Gaining a better understanding of the mediating roles of personal traits such as sensation-seeking relevant to stress and addictive behaviors could help better inform efforts to control such behaviors. Additionally, considerable research examines the positive links between depression and anxiety (rather than perceived stress) and alcohol and Internet use problems (e.g., Martin, Usdan, Cremeens, & Vail-Smith, 2014; Schry & White, 2013). Second, substantial research in the areas of the connection between sensation-seeking and such behaviors were conducted using samples of adolescents (e.g., Heo et al., 2014; Schepis, 2010).

Taken together, to our knowledge, there is no research testing the joint associations between perceived stress and alcohol and Internet use via sensation-seeking in a sample of Korean college students. Therefore, the current study aims to fill these gaps by addressing two research objectives: 1) to estimate levels of alcohol consumption and Internet use in a sample of Korean college students, and 2) to test the mediating roles of sensation-seeking on the associations between perceived stress and the levels of alcohol consumption and Internet use. Although it is not possible that findings from the current study determine causal associations, the findings may provide a more comprehensive understanding of college student alcohol and Internet use problems.

## 2. Methods

### 2.1. Participants

Our sample consisted of 870 undergraduate students (65.6% males; 34.4% females) recruited from 14 universities in South Korea using a three-stage sampling procedure. At the first sampling stage, the five largest regions of South Korea (Seoul and Gyeonggi province, Chungcheong province, Gyeongsang province, Junra province, and Kangwon province) were selected. At the second stage, three similar private universities were randomly selected in terms of college entrance scores per each region, except for Kangwon province where only two colleges were selected because of its smaller population density compared to the other four regions. Only private universities were chosen because there are variations in students in terms of socioeconomic factors between private and public universities. At the third sampling stage, study participants were recruited via flyers that directed the student to go to the student center in each university, where they would receive the survey from a trained research assistant. The participants were informed that their participation was voluntary, their responses would remain confidential, data would be stored in a secure place, and the findings would be disseminated only for scholarly purposes. Anonymity of this self-administered survey was ensured by assigning an identification number to every survey participant. The completed surveys were returned to the research assistants. In collecting the data, similar proportions of year in school were considered. The respondents received a \$3 gift card for a coffee shop.

### 2.2. Measures

Alcohol consumption was assessed using the Alcohol Use Disorder Identification Test (AUDIT), a screening tool developed by the World Health Organization in 1982. The AUDIT is a reliable measure to identify people at risk of alcohol use problems, and contains three questions on the amount and frequency of drinking (hazardous alcohol consumption, FQ), three questions on alcohol dependence symptoms (DS) and four on problems caused by alcohol (harmful alcohol consumption, HAU) (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). The first eight questions measure the level of frequency using a 5-point scale (e.g., 0 = never to 4 = daily or almost daily). Questions 9 and 10 inquire about past problems with alcohol using a 3-point scale (0 = no, 2 = yes, but not in the last year, and 4 = yes, during the last year). The total scores ranged from 0 to 40, with higher scores indicating a higher severity of alcohol consumption. There are four levels of risk: Zone 1 (scores 0–7) indicating low risk drinking (social drinking) or abstinence, Zone 2 (scores 8–15) indicating alcohol use in excess of low-risk (high risk drinking), Zone 3 (scores 16–19) indicating harmful and hazardous drinking (alcohol abuse), and Zone 4 (scores 20 or higher) indicating alcohol dependence (Babor et al., 2001). The internal reliability in our sample was 0.875.

Internet use was measured using the K-scale, a Korean self-diagnostic scale for Internet addiction developed by the National Information Society Agency (2012). This 15-item scale is designed to measure the constructs of Internet addiction life dysfunction, tolerance, withdrawal, and virtual world orientation. Each question is rated on a 4-point scale (1 = never to 4 = very) with a total score of 60. Individuals with scores of 39 or higher are classified as addicted Internet users (specifically, 39–41 are classified as users potentially at-risk, and 42 or higher are classified as high-risk users), whereas individuals with scores of 38 or lower are considered normal users. The internal reliability in our sample was 0.834.

Perceived stress was measured via seven stress-related questions from the Depression, Anxiety and Stress Scale (DASS-21) developed by Lovibond and Lovibond (1995). The reliability and validity of DASS-21 for Korean college students were tested in previous studies (e.g., Song & Lindquist, 2015). Respondents were asked to rate, on a 4-point scale,

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