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Personality profile of binge drinking in university students is modulated by sex. A study using the Alternative Five Factor Model

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ABSTRACT

Background: The prevalence of binge drinking (BD), found especially among young people, is increasing worldwide and has become an important social and health concern. We studied, for the first time, the personality profile, using the Alternative Five Factor Model, among university students with BD and healthy controls, taking into account the possible influence of sex.

Methods: 70 participants with BD (30 men) and 70 healthy controls (30 men) were included, selected to control for characteristics that are known to be related to BD (physical and mental disorders, consumption of other drugs, circadian rhythms), completed the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ).

Results: The scores on Neuroticism-Anxiety and Impulsive Sensation-Seeking were higher in the BD group compared to the controls ($p < 0.001$ in both cases). The higher scores in the BD group in Neuroticism-Anxiety are due to higher scores in the women's group ($p = 0.014$), while those in Impulsive Sensation-Seeking are due to higher scores in the men's group ($p = 0.009$), both in the Impulsivity and in the Sensation-Seeking subscales ($p < 0.045$).

Conclusions: Sex could be a factor that modulates the endophenotype of drug dependence (impulsive and anxious personality) and the prevention and/or treatment programs for BD should include not only the management of the personality risk factors but also different tailored approaches according to sex.

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1. Introduction

Binge drinking (BD) or heavy episodic drinking is defined as the consumption of high quantities of alcohol in a reduced period of time. The National Institute on Alcohol Abuse and Alcoholism proposed that “a binge episode typically corresponds to consuming five or more drinks (men), or four or more drinks (women), within a time period of approximately two hours” (NIAAA, 2004). The practice of BD is increasing and expanding worldwide, and it has been recently labeled as a “new culture of intoxication”.

BD is becoming increasingly frequent among university students. In the United States and England, BD prevalence ranges from 43% to 58.5% in men and 32% to 54% in women (Howell et al., 2013), while in Spain it is around 35% in men and 20% in

women (aged 20–24, taking into account the previous 30 days) (Spanish Observatory on Drugs, 2015). This alcohol consumption often begins around age 13, tends to increase during adolescence, with a peak in young adulthood (ages 18–22), and then gradually decreases. Evidence from longitudinal studies for BD shows moderate to strong stability over time, reflecting a large trait component with some state-like fluctuations (Mushquash et al., 2014). Furthermore, BD is characterized by a low perception of risk and polydrug consumption, with tobacco and marijuana being the most frequent substances used (Stickley et al., 2013). BD students are more likely than non-bingers to have academic problems, engage in high-risk sex, sustain an injury, overdose on alcohol and drive while intoxicated (Barnet et al., 2014; Townshend et al., 2014).

BD in young adults is related to several non-adaptive behaviors, psychological distress and mental disorders (Bauer and Ceballos, 2014; Powers et al., 2016; Sylvers et al., 2011), being a risk factor for the future development of substance use disorders and severity of addiction (Balodis et al., 2009; White et al., 2011). In this regard, in several studies high levels of neuroticism have been described in BD

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subjects (Balogun et al., 2014; Cheng and Furnham, 2013; Wellman et al., 2014; White et al., 2011); neuroticism is the most important personality dimension related to many forms of psychopathology including anxiety, depression and substance use disorders (Ormel et al., 2013).

Many studies have demonstrated that BD is related to higher scores in Impulsivity (Adan, 2012; Balodis et al., 2009; Bauer and Ceballos, 2014; Townshend et al., 2014; Whelan et al., 2014; White et al., 2011) and Sensation-Seeking, with an emphasis on its component of disinhibition (Bauer and Ceballos, 2014; Legrand et al., 2007; Pilatti et al., 2015; Wellman et al., 2014). Both personality traits seem to be predictors of quantity of alcohol consumed, maintenance of the BD pattern through the life span, development of substance use disorders (Ashenhurst et al., 2015; Cortés et al., 2014; Mackinnon et al., 2014; Marquez-Arrico and Adan, 2013), and worse adherence to treatment (Staiger et al., 2014). The high impulsivity observed in BD subjects is related to brain dysfunction in inhibitory control and reward outcome (Whelan et al., 2014), as well as poor performance in executive tasks (Bauer and Ceballos, 2014; Goudriaan et al., 2011; López-Caneda et al., 2014). On the other hand, persistence in time of BD increases impulsivity (Quinn et al., 2011; Whelan et al., 2014) and cognitive impairment (López-Caneda et al., 2014; Verdejo et al., 2008), being these effects more marked in adolescents and young people than in adults, due to the neuromaturation changes in this period (Hermens et al., 2013). Recently, it has been suggested that the combination of an impulsive and anxious personality could be considered as an endophenotype of drug dependence (Ersche et al., 2012; Valero et al., 2014).

Population studies have established sex differences in the personality characteristics. Men tend to exhibit major impulsivity and sensation seeking, in accordance with their lower self-control and higher risk of suffering impulsivity disorders (Adan et al., 2010; Cross et al., 2013; De Haan et al., 2015; Prat and Adan, 2013; Tonetti et al., 2010; Verdejo et al., 2008). In contrast, women tend to show higher levels of neuroticism (Muro et al., 2009; Randler et al., 2015). However, there are very few works analyzing the possible personality differences between sexes in relation to BD, and none has used the Alternative Five Factor Model (AFFM) measured by the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ; Zuckerman, 2002). The AFFM emerged on an evolutionary-biological basis approach that could improve other models, relying on the encoding of personality traits in language and reflecting observed behaviors in social interactions (e.g., the Big Five Factor Model), for the study of personality traits and considering their proportional biological relevance (Zuckerman, 2002). Besides, the ZKPQ has already shown concurrent and discriminant validity in addressing characteristics of substance use disorder (Marquez-Arrico and Adan, 2016; Valero et al., 2014) and pathological gambling (Ramos-Grille et al., 2015), among others.

The aim of this study was to assess, for the first time, the personality profile of university students with BD as compared to healthy controls under the AFFM perspective. Likewise, we examined whether sex could be a modulatory variable in the observed results.

2. Methods

2.1. Participants

Participants were 140 Spanish university students, all Caucasian and aged 18–25 years (21.33 ± 0.16). 70 met the criteria for BD (30 men) and 70 constituted the control group (30 men). There were no differences in age between the BD group and controls, or between men and women (see Table 1).

Using a structured clinical interview, participants were excluded if they had a history of alcohol dependence or other drugs, family history of alcoholism, daily drug intake (except nicotine and caffeine at moderate doses) and current presence of medical or psychiatric illnesses. The BD pattern was defined as intake of at least five alcoholic drinks in men and four in women, within two hours, at least once in the previous 30 days (NIAAA, 2004). No participants had sporadic repeated use of other drugs (cannabis, cocaine, etc.) and controls were not sporadic consumers of high amounts of alcohol, manifesting a maximum consumption of two low-grade alcohol drinks (especially beer) per month.

Circadian typology (morning, intermediate or neither and evening-type) was controlled by selecting only neither-type individuals, since circadian rhythmicity has an influence on the different AFFM personality traits (Muro et al., 2009; Randler et al., 2015) and drug use (Adan et al., 2012; Adan, 2013). Participants were good sleepers with a minimum of 6.5 h of regular sleep, since the sleep-wake cycle is the main marker for circadian rhythmicity; there were no differences between groups (Table 1).

All subjects participated voluntarily, were unpaid and signed an informed consent. The data in this study belong to a larger study on risk factors and impacts of BD in young people. Sociodemographic, clinical and circadian rhythmicity data were collected by an individual interview, after which those who met inclusion criteria completed the ZKPQ personality. The University of Barcelona ethics committee approved this study in accordance with the ethical standards of the Helsinki declaration.

2.2. Measures

To assess personality, the Spanish adaptation of the ZKPQ (Gomà-i-Freixanet et al., 2004) was administered. The ZKPQ consists of 99 dichotomous items covering five scales and an additional Infrequency (10 items) scale, which allows eliminating subjects with careless responding or social desirability (scores higher than 4). All participants in our study met this criterion. The five personality dimensions are Neuroticism-Anxiety, Activity, Sociability, Impulsive Sensation-Seeking, and Aggression-Hostility. Neuroticism-Anxiety (19 items) describes frequent emotional upset, tension, worry, fearfulness, obsessive indecision, lack of self-confidence, and sensitivity to criticism. Activity (17 items) describes the need for general activity and the preference for hard and challenging work, which was composed by the subscales of General Activity and Work Activity. Sociability (17 items) measures the preference for having friends and spending time with them, which also involves two subscales: Parties and Friends and Isolation Intolerance. Impulsive Sensation-Seeking (19 items) is a factor that describes Impulsivity as a lack of planning, the tendency to act impulsively without thinking, and Sensation Seeking as seeking excitement, novel experiences, and the willingness to take risks for these types of experiences. Finally, Aggression-Hostility (17 items) reflects a readiness to express verbal aggression, rude, thoughtless or antisocial behavior, vengefulness and spitefulness, having a quick temper, and impatience with others. The questionnaire has demonstrated good internal reliability, temporal stability, validity, and cross-cultural replication (Gomà-i-Freixanet and Valero, 2008; Zuckerman, 2002; Ramos-Grille et al., 2015).

In order to control for circadian typology, the Spanish version of the Composite Scale of Morningness was used (CSM; Adan et al., 2005). The scale is composed of 13 items, with a total score from 0 to 55, the intermediate typology ranging from 26 to 36. The CSM has excellent psychometric properties and transcultural validity (Di Milia et al., 2013), with 0.841 being the reliability for the present sample.

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