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Mindfulness facets and problematic Internet use: A six-month longitudinal study



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<i>Keywords:</i>	Introduction: The aim of this study was to study the cross-sectional and longitudinal associations between mindfulness facets and problematic Internet use in adolescents.
Problematic Internet use	Methods: The sample consisted of 609 adolescents (313 girls, 296 boys; Mean age = 14.21 years, SD = 1.71; age range 11–18). Participants completed a measure of five facets of mindfulness (describing, observing, acting with awareness, non-judging and non-reacting) at the beginning of the year, and measures of several components of problematic Internet use (preference for online social interactions, the use of the Internet to regulate mood, deficient self-regulation and negative outcomes) at beginning of the year and six months later.
Mindfulness facets	Results: Findings indicated that non-judging is the only dimension of mindfulness that predicts a decrease in preference for online social interactions over face-to-face relationships. Moreover, non-judging indirectly predicted reductions in the rest of the problematic Internet use components. The observing and acting with awareness dimensions of mindfulness directly predicted less deficient self-regulation. Thus, these dimensions seem to act when the maladaptive use of the Internet is consolidated.
Adolescents	Conclusions: These findings suggest that interventions should include approaches to develop those mindfulness facets that protect against the development of problematic Internet use.

1. Introduction

In recent years, the Internet has taken on key importance in the lives of adolescents and adults. The Internet is a valuable tool for leisure. work, academic activities and social relationships, among others. It has also several advantages as a medium for building emotional skills in young people (Monshat, Vella-Brodrick, Burns, & Herrman, 2012). However, the Internet can also become the setting for several maladaptive behaviors, such as Internet addiction or problematic Internet use (PIU) (Pontes, Kuss, & Griffiths, 2015; Spada, 2014). PIU includes behaviors associated with the loss of control over Internet use, cognitive preoccupation and continued use, despite negative consequences in terms of interpersonal relations, academic studies and work (Caplan, 2010). Several studies have found that PIU leads to important problems in health, family relationships, and well-being (Çikrıkci, 2016; Gámez-Guadix, Calvete, Orue, & Las Hayas, 2015; Gámez-Guadix, Orue, Smith, & Calvete, 2013). Furthermore, the magnitude of the problem is increasing. A recent review of several nationally representative samples of adolescents indicated prevalence rates of between 1% and

18% (Pontes et al., 2015). In this context, it is important to identify protective factors that reduce the risk of developing PIU. Dispositional mindfulness is one such factor that has been proposed as beneficial and providing protection against the development of several psychological problems. The current study is based on the cognitive-behavioral model of PIU and examines whether several facets of dispositional mindfulness protect against the development of PIU in adolescents.

2. The Cognitive-behavioral Model of PIU

Caplan (2010) proposed a cognitive-behavioral model of PIU that includes four main components: the first component consists of a *preference for online social interaction* over face-to-face conversation. Some psychosocial problems (e.g., loneliness, depression, and social anxiety) predispose individuals to believe that people are safer and more efficacious with online interpersonal relationships (Caplan, 2003). The preference for online social interaction increases *the use of the Internet to regulate mood* (the second component), which involves using the Internet to relieve negative states, such as sadness, stress or

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anxiety (Caplan, 2010; Gámez-Guadix, Villa-George, & Calvete, 2012). In addition, both the preference for online interaction and the use of the Internet for mood regulation increase *deficient self-regulation of Internet use* (the third component), which includes *cognitive preoccupation* and *compulsive Internet use*. The component of deficient self-regulation has become a salient aspect of PIU (Özdemir, Kuzucu, & Ak, 2014). Moreover, the inclusion of this component led Shapira et al. (2003) to suggest that PIU could be classified as an impulsive control disorder. Finally, deficient self-regulation of Internet use, in turn, increases the likelihood of developing *negative outcomes* (the fourth component), such as health, academic and social impairments as the consequence of Internet use (Caplan, 2010).

A recent longitudinal study has provided support for the above causal model, which emphasizes the presence of difficulties in self-regulation and emotional distress in PIU (Gámez-Guadix et al., 2015). Furthermore, research has found that Internet addiction is associated with attention deficits (Yen, Yen, Chen, Tang, & Ko, 2009) and that several psychosocial problems, such as social anxiety (Casale & Fioravanti, 2015; Huan, Ang, & Chye, 2014), loneliness (Huan et al., 2014; Özdemir et al., 2014), and depressive symptoms (Gámez-Guadix, 2014) are associated with PIU.

3. Dispositional mindfulness

During the past decades, mindfulness-based interventions have experienced considerable development within the so-called 'third wave' of cognitive behavioral therapies. It has been proposed that the benefits of mindfulness training for health and well-being are mediated by an improvement in dispositional mindfulness. Thus, the construct of dispositional mindfulness itself and its role in the emergence of several psychological problems has become the focus of an increasing number of studies (e.g., Calvete, Orue, & Sampedro, 2017; Dixon & Overall, 2016; Royuela-Colomer & Calvete, 2016).

The study of the role of dispositional mindfulness in psychological problems has been limited by the lack of consensus regarding the concept of mindfulness. In 2004, a group of experts (Bishop et al., 2004) proposed a conceptualization of mindfulness as a two-component construct. The first component consists of the self-regulation of attention so that it is maintained on the immediate experience. The second component consists of adopting an orientation toward one's experiences in the present moment, characterized by curiosity, openness, and acceptance. Although this two-dimension perspective of mindfulness has predominated in the field, theory and empirical research have also proposed additional components of dispositional mindfulness. Notably, Baer, Smith, Hopkins, Krietemeyer, and Toney (2006) examined the mindfulness structure by means of exploratory and confirmatory factor analyses of items from several mindfulness questionnaires. They found that mindfulness includes five facets:1) observing, which consists of attending to or noticing internal or external experiences; 2) describing, or the use of words to describe inner experiences; 3) acting with awareness, or attending to the present moment; 4) non-judging of inner experience, or the non-evaluation of thoughts and feelings; and 5) nonreactivity to inner experience, or the ability to let feelings and thoughts come and go, without getting caught up in them. Whereas facets such as acting with awareness and observation reflect the self-regulation of the attention dimension of mindfulness proposed by Bishop et al. (2004), other facets such as non-judging and non-reactivity to inner experience reflect the acceptance dimension.

Several studies have examined the role of dispositional mindfulness in psychological problems. Although most of these studies have focused on depression (e.g., Ciesla, Reilly, Dickson, Emanuel, & Updegraff, 2012; Royuela-Colomer & Calvete, 2016), some studies have also examined the role of dispositional mindfulness in psychological problems that involve self-regulation difficulties. For instance, a number of studies have found that dispositional mindfulness is negatively associated with substance use (Brown, West, Loverich, & Biegel, 2011; Calvete, Sampedro, & Orue, 2014; Calvete et al., 2017). The protective role of dispositional mindfulness against substance use could be explained because the awareness component of mindfulness increases self-regulation and because mindfulness promotes adaptive ways of reacting to distress and negative situations (Tarantino, Lamis, Ballard, Masuda, & Dvorak, 2015).

4. Mindfulness facets and PIU

The above findings on the beneficial role of dispositional mindfulness in several psychological problems, including substance use, suggest that it can act as a protective factor for PIU. Individuals who score high on dispositional mindfulness are characterized by adequate interpersonal skills (Dekeyser, Raes, Leijssen, Leysen, & Dewulf, 2008) and poor interpersonal skills are proposed as an antecedent of PIU (Caplan, 2010). In addition, both main dimensions of dispositional mindfulness (i.e., awareness and acceptance) are associated with fewer symptoms of distress, anxiety, and depression (Calvete et al., 2017; Ciesla et al., 2012; Royuela-Colomer & Calvete, 2016) and emotional distress is proposed as another important antecedent of preference for online social interaction (Caplan, 2010). Furthermore, the components of non-judging and non-reactivity may promote healthy engagement with emotions and thus, facilitate alternative emotion-regulation strategies to using Internet to relieve negative emotions (Chambers, Gullone, & Allen, 2009). Finally, some components of mindfulness, such as observing and acting with awareness, are proposed to improve executive control (Teper, Segal, & Inzlicht, 2013) and, therefore, could mitigate the deficient self-regulation of Internet use.

Nevertheless, evidence of the association between dispositional mindfulness and PIU is scarce. Kuss, Van Rooij, Shorter, Griffiths, and van de Mheen (2013) found that the personality factor of conscientiousness, which has been associated with dispositional mindfulness (Latzman & Masuda, 2013), acted as a protective factor in high/ frequency online gamers. More recently, Gámez-Guadix and Calvete (2016) conducted a study to examine whether dispositional mindfulness was associated with PIU in a large sample of adolescents. Their findings indicated that mindfulness was negatively associated with all components of PIU: preference for online social interactions, mood regulation through the Internet, deficient self-regulation, and negative outcomes of PIU. Furthermore, some of the associations between mindfulness and PIU components were indirectly mediated by other PIU components. For instance, mood regulation and deficient selfregulation of Internet use mediated the association between mindfulness and negative outcomes. Nonetheless, their study had two important limitations. It was a cross-sectional study, which prevents examining predictive associations between mindfulness and PIU. In addition, the study only included the acting with awareness component of mindfulness. However, as described above, dispositional mindfulness includes several other components. Thus, additional research is necessary to assess the predictive role of the multiple dimensions of dispositional mindfulness in PIU.

5. Overview of the current study

The aim of this study was to study the longitudinal associations between mindfulness facets and PIU components in adolescents. The identification of those facets associated with a lower PIU should guide the development of preventive interventions of PIU in adolescence, a developmental stage in which PIU is highly prevalent (Pontes et al., 2015). Adolescence is a specifically critical time for the appearance and development of most of problem behaviors (Eaton et al., 2012), including PIU. Moreover, PIU during adolescence precedes other problem behaviors such us substance abuse and cyberbullying (e.g., Gámez-Guadix et al., 2015). Early identification of protective factors for PIU could therefore make a major contribution to the well-being of adolescents.

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