

Impulsivity and Addiction Symptoms of Internet and Electronic Screen Based Device Use Among Adolescents

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Nowadays electronic screen based device use is common in both developed and developing countries. The portability, availability and affordability of electronic screen based devices minimise the constraints on location and time for the device use [1]. Lemola, Perkinson-Gloor [2] found that adolescents who owned a smartphone spent significantly more time on Internet activities and social networking per day.

Excessive time spent on a behavior is probably one of the indicators of the severity of behavioral addiction. Behavioral addictions were found to be related to increased frequency and time spent on the behaviors, and share common components such as salience, tolerance, withdrawal, relapse, mood modification, interpersonal conflict, social dysfunction and poor time management [3]. López - Fernández, Honrubia Serrano [4] conducted a survey of 1097 UK adolescents aged 11 - 18 and found that frequency and time spent on the Internet were significantly and positively associated with problematic Internet use. Yoo, Cho [5] conducted a survey of 73238 South Korean adolescents aged 12 - 19, and found that adjusted odds ratios of Internet addiction increased along with time spent on the Internet.

Internet and smart devices are platforms for various types of electronic screen-based activities. Excessive and problematic use of electronic screen-based device for a particular electronic activity may contribute to the symptoms of Internet or smart device use addiction measured with psychometric instruments [6-8]. Salehan and Negahban [9] conducted a survey of 209 US youth and found that frequency of using mobile applications of social networking sites was significantly associated with mobile phone addiction. In South Korea, the Internet addiction rate among adolescents was the highest [10], but their smartphone addiction rate was even higher [11].

Time spent on electronic screen based activities could be additive. The more types of activities involved in multitasking may be associated with the higher risk of addiction. Multitasking behavior in electronic screen based activities was identified among the US youth [12,13] and was found to be significantly and positively associated with smartphone addiction [14]. Leung and Lee [15] conducted a survey of 718 Hong Kong adolescents with a mean age of 14.5, and found that time spent on the Internet and frequency of social networking and online gaming were significantly and positively associated with Internet addiction.

The tendency towards impulsiveness or the inability to delay gratification are hallmarks of addictive behavior [16]. Impulsiveness is characterised by need satisfaction without forethought and behavioral disinhibition [17,18]. Adolescents might be relatively prone to emotional reactivity and impulsive behavior and judgment compared with adults [19]. Human brain continues to develop throughout adolescence till early adulthood, undergoing both structural changes and alterations in neurotransmitter receptors [20]. The robust changes in the prefrontal and orbitofrontal cortices, which are responsible for aspects of executive function, including decision making and judgment [21-23], may be associated with impulsiveness and poor judgment that place some adolescents at risk of problematic behaviors [24].

Impulsiveness was found to have a positive association with Internet addiction [25-30], which was considered as a subtype of impulse control disorder [31] and categorised as an Impulse Disorder in Diagnostic and Statistical Manual of Mental Disorders (DSM) IV [32,33] and Internet Gaming Disorder in DSM V [34]. Impulsiveness was considered to be one of the key characteristics of poor self-control [35-38], which was defined as inability to resist an impulse and delay gratification [36]. Poor self-control in electronic screen based activity is probably governed primarily by the reinforcement of immediate gratification and short-term rewards through Internet surfing, gaming or social networking [35,39], and has been found to be associated significantly with addiction symptoms in Internet, games and mobile phone use [40].

Impulsiveness and sensation seeking were both considered as facets of addictive personality [41,42]. Sensation seeking and the number of devices owned were found to be associated with media multitasking [43]. Lin and Tsai [44] found that adolescents who were Internet-dependent scored significantly higher than those who were not Internet-dependent in Sensation Seeking Scale [45] and its subscale of Disinhibition. Velez-moro, Lacefield [46] found that problematic Internet use was predicted only by disinhibition, and not by other sub-dimensions of sensation seeking. The relationship between disinhibition and problematic Internet use demonstrated its closeness to impulsive behavior [47]. Lin and Tsai [44] also found that Disinhibition was the most important subscale of Sensation Seeking Scale associated with dependence, withdrawal, tolerance and compulsive use of Internet. Although Internet addiction shared common symptoms with compulsive impulsive disorders [47,48], impulsivity was found to be stronger than obsessive compulsive symptoms in predicting Internet addiction [49].

Impulsiveness is likely a significant risk factor of addiction in electronic screen based activities among adolescents who probably is a high-risk group subjected to the influences of developmental, psychological and socio-economical factors. The addiction in social networking site use, Internet use and smartphone use might cover problematic uses of multiple types of electronic activities such as gaming, messaging, browsing and posting which might have different strengths in their relationships with psychological symptoms and social dysfunctions. One of the future directions of research on online behavior and electronic screen based device use among adolescents may be focusing on exploring specific types of activities and their purposes which associate with personalities, psychological symptoms and social dysfunctions so as to identify modifiable targets of behavioral interventions for achieving positive outcomes.

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