A review of Internet addiction with regards to assessment method design and the limited parameters examined

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Abstract

"Internet addiction" (IAD) was formally introduced in the late 1990's, and while it has not been extensively researched compared to other pathologies, it is significant enough to be considered for inclusion into the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). [1,2]. Although many methods evaluating internet usage have been developed, a gold standard IAD test has not been recognized, and knowledge is therefore limited regarding the consequences of pathological internet use on a person's well-being [3]. This article attempts to highlight a sample of the general IAD literature with regards to its shortcomings and its findings regarding sample population demographics, lifestyle, and predictive values.

Keywords: Internet addiction, scale, risk factors

Background and significance

The internet is an important tool for everyday use in the lives of many individuals. While most consumers approach internet use in a controlled manner, some users experience a gradual loss of the capacity to regulate the duration and frequency of their internet activities [4]. As a result, the unrestrained time allocated to internet use and the behavioral narrowing can contribute to considerable psychosocial outcomes and is termed "Pathological Internet Use" or IAD. Prevalence data concerning IAD are minimal due to difficulties in methodology regarding the diagnosis and the heterogeneity of diagnostic measures. In fact, international prevalence rates have been reported from 1.5% to 8.2% of the continuously increasing number of people who are connecting to the internet each day. Therefore, reliable diagnostic instruments or measures are necessary to allow proper and valid international comparisons.

Shortcomings of the current assessment designs

A majority of the studies concerning internet addiction have sampled large populations through internet surveys employing the most common assessment method known as the Internet Addiction Test (IAT) [1]. However, anonymous surveys and the IAT's design and application provide restricted clinical insight and knowledge is, therefore, minimal regarding the ramifications of IAD on a person's well-being [3]. In order to be incorporated into the DSM-5 nosology a more comprehensive method for assessment and understanding is needed [1].

Therefore, several attempts to modify the IAT or to create an easily administered, psychometrically sound, and valid instrument to measure the severity of compulsive Internet use have been proposed [5]. For example, Bowen et al provide IAT modifications for application within a structured individual patient interview [1]. Their results were examined with regard to the clinical benefits of the IAT assessment procedure and considerations for inclusion in the upcoming DSM-5. In addition, Meerkerk et al developed and introduced a totally new instrument, known as the Compulsive Internet Use Scale (CIUS), which features 14 items that are ratable on a Likert 5-point scale [5]. In trials the CIUS showed reliable factorial stability across time and different sample populations. Furthermore, Clark and Frith, describe the development of the Internet Consequences Scale (ICONS), an effective instrument assessing 44 items used to measure internet use regarding pyschosocial consequences and its impact on an individual's behavior, finances, and physiology [3].

This dominant issue regarding IAD diagnosis involves assessing the validity of the method used to measure a users' level of Internet participation and creating a gold standard [6]. Moreover, many of the current measures used to assess Internet addiction have not yet been tested psychometrically. Therefore, Widyanto et al compared two of the prominent internet addiction research measures, the Internet-Related Problem Scale (IRPS) and the IAT. They also employed a self-diagnostic survey asking participants if they thought they were indeed addicted to the Internet. The persons who described

themselves as addicted to the Internet had increased scores on both the IRPS and IAT. The implications for such an addiction include emotional/psychological conflict; time management issues; loss of control, and modification of the addicted persons mood.

Population Analysis

One major sample population for examining consequences of IAD includes those who play video games known as Massively Multiplayer Online Role-Playing Games (MMORPGs) which are an extremely popular worldwide leisure activity [7]. MMORPGs involve a large number of players interacting with one another via the internet in a continuous virtual world [8]. While MMORPGs are extremely popular they can become problematic effecting the daily living patterns of a small but significant proportion of gamers [7]. Adverse effects such as excessive use and isolation are becoming more prominent as the number of gamers increases. Problems may also include loss of control regarding gaming behaviors as well as jeopardizing social and individual quality of life [8]. Van Rooij et al analyzed online gamers to determine that approximately 1.5% of all children in the Netherlands from 13-16 years are effected by internet addiction [9]. Despite the small percentage value, distinguishing such a group of addicted online gamers validates efforts to establish and verify questionnaire scales designed to specifically measure online gaming addiction.

Furthermore, because these types of games have such vast appeal, internationally validated methods to evaluate IAD with regards to excessive gaming are necessary to screen players who are at potential risk of MMORPG addiction [8]. Achab et al referenced this need as they examined patient characteristics, online habits and troublesome overuse in adult MMORPG gamers [7]. The researchers screened addiction in 448 participants using three different methods in a population of MMORPG gamers recruited online over 10 months. These methods included the qualitative Goldberg Internet Addiction Disorder scale (GIAD), the quantitative Orman Internet Stress Scale (ISS) and the substance dependence criteria for the Diagnostic and Statistical Manual of Mental Disorder, fourth revised edition (DSM-IV-TR) that has been adjusted for MMORPG (DAS). Achab reported that the DAS appears to be an acceptable screening tool for MMORPG addiction in online gamers. The results justify prevention programs against online game overuse as the study found high MMORPG addiction rates, and self-reported adverse symptoms effecting mood and sleep.

Additional known evaluation methods were incorporated by Schmit et al to compare social characteristics, coping strategies, self-esteem and depressive symptoms between a population dependent upon online video games versus a population which is not dependent on video games online [10]. The results noted significant differences between the two populations, particularly concerning social characteristics, depressive symptoms, coping strategies and self-esteem. Billieux et al also used multiple instruments to examine various psychological predictors in relation to problematic participation in MMORPGs [8]. Male subjects recruited from cyber cafe's were screened to assess impulsivity using the UPPS Impulsive Behavior Scale. Researchers also used a questionnaire to analyze the personal motives as to why the players participated in MMORPG activity. Negative consequences due to excessive game play were analyzed using the IAT. The study revealed that problematic use of MMORPGs may be predicted by both a high urgency and a motivation to play the games for immersion. The researchers concluded that problematic behavior can be predicted in gamers who are likely to react impulsively in emotional situations and who are attracted to the idea of emersion in a virtual world.

Predictive behaviour in IAD subjects was further noted when Jang et al identified individual factors associated with IAD and investigated psychiatric symptoms in adolescents using controlled demographic and Internet-related factors [11]. The results of their study suggested that male gender, internet chatting, and progressively longer Internet use per day were notably linked to Internet addiction. When the researchers controlled demographic and Internet-related factors, they noted that obsessive-compulsive and depressive symptoms were individually associated risk factors related to Internet addiction. Jang suggests that staff working with adolescents should take notice of those students who possess such risk factors as early intervention and preventative treatment may help reduce internet addiction in a high-risk individual.

Risk factors and predictive values regarding IAD were also a key subject examined by Ko et al [12]. A two year prospective study was designed to analyze the predictive values of psychiatric symptoms in relation to the incidence of Internet addiction in adolescents. The researchers assessed Internet addiction using the Chen Internet Addiction Scale and concluded that attention-deficit/hyperactivity disorder, hostility, depression, and social phobia were significant predictors of internet addiction. Therefore, they postulate that these predictors should be detected by clinicians as early as possible and intervention methods implemented in order to prevent Internet addiction in adolescents.

Beyond predictive values, other associative IAD measures have been examined in the last decade. Yang et al examined the association between internet addiction and suicidal behaviors in adolescents to determine if the

association could be a consequence of behaviors related to the impulsity and/or depression [13]. The researchers investigated 3507 adolescent participants and found that approximately 5% were diagnosed as IAD. Suicide ideation during 12 months prior to the survey was reported in 27.4% of the participants while 9.5% of participants had a plan and only 2.6% had attempted suicide. Yang et al conclude that while Internet addiction is not substantially associated with suicide attempt, it correlates with suicidal ideation and plan as the associated percentages were higher in the IAD population compared to the general adolescent population. When factors such as depression and behaviors associated with impulsivity were recorded into Hierarchical regression, the relationship between internet addition, suicidal ideation and plan were significantly decreased. However, as internet addiction was registered into Hierarchical regression, the association between depression, and impulsive behaviors in relation to suicidal ideation and plan were not lowered. Yang, therefore, determined that adolescent internet addition may be linked to suicidal ideation and plan and potentiated by depression and behaviors related to the impulsivity.

In addition to gaming populations and chat room participants examined above, IAD can also present with problematic Internet sexual use [14]. This topic was investigated by Ross et al using a sample of 1,913 Internet-recruited Swedish men and women. Components assessed included problems associated with control of internet use, dysphoria, the feeling of "addiction", and a self realization regarding need for treatment. The researchers report that 5% of women and 13% of men reported various internet sexual problems. Furthermore, 2% of women and 5% of men express serious problems with regards to all items assessed.

Significant predictors of problematic use included negative experiences with Internet sexual use, and frequency at which a person views pornography. Furthermore, the viewing and sharing of pornographic material was highly associated with noted problems. Data also supports that having very specific interests regarding pornographic content was associated with a rise in the number of reported problems. While the report is limited in that it uses information obtained from a non-random sample, the data does indicate that Internet sexual problems do affect a small but significant subset of the Internet-using population and can be quantified.

In general, further effects of IAD and its influence on lifestyle have also been examined [15]. Kim et al determined that high-risk Internet users have poor diet quality and behaviour. Students were evaluated using the Korean Internet Addiction Self-Scale short form for youth, and classified as high-risk Internet users, potential-risk Internet users, and no risk Internet users. Comparisons between the students' levels of Internet addiction were associated with diet and lifestyle patterns. Alcohol and tobacco use, as well as sporatic sleep behaviour was more predominant in high-risk Internet users compared to the no risk group. High-risk Internet users also demonstrated a loss of appetite resulting in irregular dietary behavior such as skipping of meals and limited diet quality. The imbalances in diet quality could result in delayed development and therefore, justify proper nutritional education directed towards high risk internet users.

In addition to nutrition, lifestyle factors such as sleep patterns have also been analyzed with regards to IAD [16]. Cheung et al analyze the relationship between insomnia and internet addiction with regards to how they effect depression. Participants were assessed using a 12-item version of the General Health Questionnaire (GHQ-12), the Pittsburgh Sleep Quality Index (PSQI), the Chinese Internet Addiction Scale (CIAS), and questions designed to examine patterns of internet use and socio-demographic features. Among the 17.2% of participants determined to be internet addicts, nearly half of them suffered from insomnia. The researchers concluded that there is a significant comorbidity between insomnia and internet addiction and that both exemplify differential effects regarding depression.

Also, lifestyle parameters such as parental rearing styles and their association to adolescent males with internet addiction disorder were analyzed by Xiugin et al [17]. The researchers examined personality profiles of 304 participants with and without IAD to learn if excessive internet use is linked to distinctive parental rearing behaviors. The data suggested adolescents with IAD revealed significantly higher incidence of obsessive-compulsive characteristics, interpersonal sensitivity, anxiety, hostility, paranoid ideation, and depression. In addition, the Internet-dependent participants demonstrated a notably lower degree of extraversion and a significantly higher degree of psychoticism when compared with the non-addicted control group. Finally, and perhaps most notably, the participants with IAD commonly rated the rearing practices of both as being overbearing and intrusive, lacking in emotional warmth and responsiveness, and often rejecting and punitive. The study validates the observation that IAD generally occurs simultaneously with other mental symptoms and personality characteristics such as psychoticism and introversion. The study also supports the idea that parenting style and family function are among significant factors which may influence Internet dependency.

Conclusion

In conclusion, IAD is a significant problem as it may effect quality of life issues such as loss of control regard-

ing time management, sleep, diet, and sexual behaviors [6]. Furthermore, IAD may be associated with and predicted by many factors including depression and impulsive behaviors and should be detected and addressed as early as possible to curtail the negative implications of such an addiction [8,11]. The predominant issues concerning IAD diagnosis involve isolating and validating a gold standard assessment method [6]. Validation of such an instrument will not only help to identify and prevent cases of IAD early in their development but will also help researchers to further distinguish and understand the consequences and future development of the pathology [3].

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