

Problematic Internet Use in Youth: An Outline and Overview for Health Professionals

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Abstract: *The broad field of Internet-related psychology, and problematic Internet use (PIU) in children and teenagers in particular, has attracted much clinical and research interest in the two decades since the emergent condition was first described. It is a complex, evolving, and controversial phenomenon; there remains debate about whether PIU merits being classified as a ‘mental health disorder’ in its own right. An important positive step was taken in the fifth edition of the Diagnostic and Statistical Manual, or DSM-5, with inclusion of ‘Internet gaming disorder’ in the manual’s Section III ‘Emerging Measures and Models’. This review paper, for the practising clinical psychologist working with children, teens and families, will provide an overview of this multi-faceted, and at times challenging condition. It will examine its historical development, outline key research findings on prevalence, co-morbidity and neurobiological studies, and appraise methods on the condition’s assessment and treatment, particularly in the Australian context.*

Keywords: *problematic Internet use, child psychology, computer gaming, Internet addiction, adolescent mental health*

Introduction and Historical Development

“Here’s looking at you, kid”. Though these famous words hail from the soft-focus, black-and-white world of Hollywood’s Golden Age, they could as easily apply to the selfie-admiring, hyperconnected age of today. It now seems a simple truism to state that the phenomenal rise of the web, the Internet and associated computing technologies has revolutionised the way many generations—but in particular the younger generations—communicate, seek entertainment, inform themselves and engage with the broader world. However, as with almost every significant innovative and ground-breaking technological development, often unforeseen and negative consequences have emerged in recent decades. The most notable of these consequences include problematic Internet use (PIU)—often popularly dubbed ‘Internet addiction’, cybersafety (eg. cyberbullying and sexting), and cybersecurity issues.

This paper will focus on the first of these three domains, with an emphasis on children and teenagers. It presents an overview of what is a complex, controversial and ever-evolving domain, and seeks to highlight some of the major historical and more recent developments, maintaining a practical and clinical perspective of use to the clinician who may be treating clients with ‘technology overuse issues’ as part of their presenting picture.

Definition, Classification and Prevalence Studies

The first clinical descriptions of this novel disorder—and the first use of the term ‘Internet addiction’—began to emerge in the mid- to late-1990’s (Young, 1996), soon after the emergence of the ‘World Wide Web’ as a powerful global, economic and cultural tool. From the outset, there was active debate whether it should be considered a form of impulse-control disorder analogous to pathological gambling (Block, 2008), or more similar in nature to substance use disorders, or whether it was worthy of consideration as a psychological condition at all (Swaminath, 2008). There have also been numerous terms used for the condition, from the initial ‘Internet addiction’, to ‘video game addiction’ and ‘compulsive Internet use’. In the present paper, the more neutral and less potentially derogatory term ‘problematic Internet use’, PIU, will be utilised (Shapira et al., 2003). PIU will be conceptualised here as : the pervasive, sustained and heavy usage of Internet and computer technologies (ICT) by a person, which results in a clinically significant impact in that persons daily functioning, roles or expectations, and which persists despite efforts in the client, or in the social circle, to reduce that usage. Of note, in this definition, it is not just the *hours* spent gaming or online that is key, but what *real world activities* are negatively impacted through the day, or night, by this usage. In school-aged children and teenagers, these activities would include homework or revision, eating and family time, sporting activities, sleep patterns and, in the more advanced forms, school attendance itself (Leung, 2007). The term also takes a broad view of the activities undertaken online and on a computer or other device. Though video and Internet gaming has attracted the most research attention due to its highly compelling nature, other activities such as excessive social media use, online shopping and gambling, adult website use, or video-viewing may also lead to clinically significant issues in the client. It is also true that computer-based activities do not necessarily have to be online to be a potential problem; stand-alone gaming consoles, for example, could lead to mental health difficulties if played to excess.

As international research in the domain gathered pace, numerous assessment instruments were developed to assist with prevalence, neurobiological and treatment studies. However, concerns were raised about the cross-validity of these tools—making comparison between studies problematic—and the intrinsic accuracy and validity of the tools. To date, the ‘Young Internet

Addiction Diagnostic Questionnaire', or Y-IADQ, remains the most widely-used tool in research (Widyanto & McMurren, 2004) and has been translated into the largest number of different languages. Assessment considerations will be explored further in the relevant section, below.

As is also often the case with newly-described clinical conditions, problems of accurately defining PIU persist (Starcevic, 2013). Many researchers—and many in the general population—do not consider that it merits being classified as a 'genuine' mental health disorder. However, in 2013, a specific subtype of broadly-defined PIU, termed 'Internet Gaming Disorder' was included in Section III, conditions for further study, of the DSM-5 (American Psychiatric Association, 2013). This condition referred only to online forms of gaming overuse, as the majority of the research to date had focussed on gaming compared to, for example, social media or online gambling overuse. As was noted above, however, other domains of Internet usage may also show 'addictive' potential (Griffiths, 2014), and thus also merit future research focus. Many studies specifically focus on online game-playing, while some do not specify the types of activities undertaken online, which adds to difficulties in interpreting and comparing results across studies.

Since the initial descriptions of PIU, or Internet addiction, there have been many international studies looking at prevalence, gender differences, and associated characteristics. Given the diversity of assessment tools utilised, it is difficult to draw firm conclusions, but most of the larger, higher-quality studies indicated a point-prevalence of between 5% and 10% (Park, Hong, & Park, 2012; Gentile et al., 2011; Grusser, Thalemann, & Griffiths, 2007). Studies also tended to utilise—probably for convenience of access—university or college students as subjects, often only males, which again could cast doubt on the representativeness of findings. A systematic review of prevalence research (Byun et al., 2009), indicated that, in the two decades since studies have been undertaken, a wide range of tools and 'diagnostic cut-offs' were utilised, pointing to a need to unify methodologies. More recently, an attempt has been made (Petry et al., 2013) to standardise the criteria for diagnosis of Internet gaming disorder (IGD) within the DSM-5 framework, and to thus facilitate international collaborative research.

All these findings sit within the broader field of 'Internet psychology'; how general populations utilise the web to communicate, form groups and networks, seek information and entertainment, and so forth (Joinson, 2007). Numerous studies of ICT usage in the Australian context have been undertaken, as well as internationally: the most recent major one (Brand and Todhunter, 2015) studied 1274 representative households in Australia, examining online gaming habits, attitudes and networks. Among many important findings, this report showed that the average age of a gamer was 33yrs, and that 98% of households with children possess at least one computer gaming device.

Comorbid and Associated Mental Health Conditions

From the earliest descriptions and formal studies of PIU subjects, it was evident that co-morbid pathology, or at least psychological distress, was a very common and prominent feature. Numerous studies have sought to investigate the association between PIU and a wide range of other mental disorders, including in the teenage population. These included depression (Ybarra, Alexander, & Mitchell, 2005), ADHD and impulsivity (Yen, Ko, Yen, Chang, & Chen, 2009), bipolar disorder (Park, Kim, & Lee, 2012) and loneliness/low self-esteem (Lam et al., 2009). Autistic-spectrum disorder has also shown potential for an association with PIU (Romano, Osborne, Truzoli, & Reed, 2013). Most studies utilised a cross-sectional design, so conclusions as to the direction of causation of the variables are hard to draw. As is the case with many substance and behavioural addictions, there is a 'transactional model' occurring between the addiction and the co-morbid condition, with each impinging on and worsening the other, and thus making successful treatment harder to achieve. Of note, a recent major study (Ciarrochi et al., 2016) followed more than 2000 Australian high school children over a four-year period, and indicated that PIU generally peaked in the school years eight and nine; PIU was associated in a causative way with the later development of mental health symptoms, but not the other way round.

PIU and Physical Health

Given the reach and pervasiveness of ICT into many peoples' daily lives, routines and broader lifestyle, it is unsurprising that much recent research has focussed on the potential links between PIU and physical health outcomes or impacts. Three major areas of focus in this domain are: obesity and physical activity, myopia (short-sightedness), and sleep disorders. Recent research has suggested that the 'added burden' of screen and computer time may have adversely impacted on obesity rates (Rosen et al, 2015). These findings are of key relevance to Western countries such as Australia, where obesity rates are already very high. Regarding myopia, it has been postulated that heavy screen usage, and lack of time spent outdoors especially from an early age, may be a causative factor in the very high youth myopia rates observed in some South-East Asian countries (Wu, Tsai, Wu, Yang, Kuo, 2013). Finally, the domain of healthy sleep patterns and PIU attracts much research interest. The intense ultraviolet light emitted by electronic devices may adversely affect the amount high-quality, rapid eye movement sleep. A recent major study of nearly 10000 adolescents aged 16 to 19, using a general-population cohort in Norway (Hysing et al., 2015), showed a clear and significant negative association between day-time and night-time ICT usage, and the quality and total length of sleep. However, the use of self-report surveys to gather data may limit the robustness and accuracy of the findings.

Parenting, Personality and Transcultural Considerations

Research into the potential role and impact of transcultural, personality and familial/ parenting factors in the development, shaping or modulation of PIU issues forms an intriguing recent development in the field. A small number of valid, specifically-designed cross-cultural comparison studies have been performed (e.g., Zhang, Amos, & McDowell, 2008). This study, though based on self-report measures, did show a significantly higher rate of PIU in Chinese as opposed to American students. As noted above, the use of differing rating-scales and surveys in studies across the world has hindered direct comparison of findings. Yang, Sato, Yamawaki, and Miyata (2013) examined PIU rates, parenting and child-rearing styles, and depression rates in nearly 500 Chinese and Japanese university students. Among many notable findings, a cold, distant or over-controlling parenting style shown by the mother (but not the father) was associated with higher PIU rates; this style was significantly more common in the Japanese group. Similar findings about the effect of parenting style and risk of developing PIU was found in an earlier study of 304 Chinese teenagers (204 positive cases and 100 controls), where a lack of parental warmth and responsiveness, and the presence of maternal punitive approaches were positively correlated with PIU development (Huang et al., 2010). It has been postulated that positive family and parenting styles in the broad sense (empathy, providing structure, building social competence and confidence) can act as protective or moderating factors in the complexity of PIU development over time (Tam & Walter, 2013), though this has yet to be empirically tested. In another innovative study, Snodgrass, Dengah, Lacy, and Fagan (2013), examined the role of cultural identity, group norms and core beliefs, and their associations with gaming behaviour, and potential development of PIU difficulties using qualitative and quantitative data-sets.

Personality style and use (and abuse) of Internet-mediated communication and gaming has also attracted much interest. In Huang et al's (2010) study, the teenage subjects also completed the Eysenck Personality Questionnaire (EPQ), and those affected by PIU showed higher scores in the domains of introversion, aggression and egocentricity, and lower scores in extraversion. In an innovative study utilising a popular fantasy-based roleplaying game, Yee and Bailenson (2007) demonstrated that external manipulation of the gameplayer's 'avatar' (the online, tailored graphical representation of the character) by a researcher could affect their behaviour, confidence and success in within the game. They have dubbed the effect of altering characteristics such as height, perceived attractiveness and strength the 'Proteus Effect', and have speculated whether these 'virtual' behaviours could be transposed into the 'real' world. A similar theory has been proposed by psychiatrist and researcher Dr. Elias Aboujaoude (2011), in his textbook *Virtually You: The Dangerous Powers of the e-Personality*, where numerous case studies that he describes show an overinflated self-

image, narcissism, grandiosity and, ultimately, a closer and potentially pathological identification in the subjects' 'false online image' of themselves, than compared to their 'real self'.

Given the richly diverse multicultural, geographic and economic nature of contemporary societies such as Australia, and the ever-increasing reach of the web and the Internet into daily lives, the domains outlined above provide much material for consideration in both clinical practice, and in future research endeavours.

Neuroimaging and Neuropsychological Studies

From the mid-2000s, there have been a small number of neuroimaging (NI) and neuropsychological studies aiming to delineate potential neurological underpinnings of PIU. Though an extensive review of this complex and fruitful area is beyond the scope of the present article, NI studies have generally focussed on the domains of white matter tract alterations (Han, Kim, Bae, Renshaw, & Anderson, 2015), frontal lobe changes and limbic-system changes (Ko, Liu, & Hsiao, 2009) using a range of imaging modalities including PET, fMRI and SPECT. These anatomical structures are important as attentional, reward and executive-functioning pathways, and thus highly relevant to PIU and other addictions. Often, NI is performed in conjunction with neuropsychological studies (such as salience, disinhibition and attentional correlates) (Dong, Devito, Du, & Cui, 2012), to attempt to build up a 'whole of brain' picture, uniting the anatomical, physiological, behavioural and psychiatric domains of enquiry (Kuhn & Gallinat, 2014).

The recent paper by Han and colleagues (2015) utilised fMRI scanning in more than 150 adolescents in South Korea (PIU cases and controls). Of note, most of the alterations, such as hyperconnectivity between key information-processing and salience-attribution regions, could be considered to confer benefits, rather than to result in pathology.

An important potential consequence of these NI findings, if they are found to be robust and to be clinically significant and long-term in nature, concerns the 'safety' of heavy games consumption from a young age (Tam, 2015). If heavy gameplay is demonstrated to be potentially harmful to developing neurological systems, questions may need to be raised about moderating or controlling excessive Internet use and gaming in young people, and in subjecting the gaming industry to further regulation and control analogous to other industries which manufacture and sell other 'addictive' products and substances such as alcohol or cigarettes.

Assessment and Treatment Approaches

As is to be expected in a recently-described and highly complex clinical condition, there is no single, generally-accepted method of assessing and formally diagnosing the condition. As noted above, many self-report tools exist to aid diagnosis, varying in length from the 8-Item Y-IADQ (Young Internet Addiction Diagnostic Questionnaire), to the 36-Item Online Cognition Scale (Davis, Flett, & Besser, 2002). Some encompass all aspects of online activity, whilst others look at only online gaming. It is clear that administering a single diagnostic tool will not suffice in the clinical preparation of a holistic case formulation. As has been outlined, aspects of co-morbidity, personality, family and broader 'social circle' factors will be important, as will aspects of physical health, sleep patterns and non-online activities and pursuits. The taking of a detailed Internet use inventory will also be vital in appraising the client's ICT usage, including not only the total hours spent online in a twenty-four hour period or weekly period, but at what specific times through the day, evening or night this use occurs. Clearly, this is of particular importance in school-age children. It would also be relevant to note what specific activities are undertaken, for example, gaming, social networking, online shopping, or gambling. This is important as different activities undertaken on the web may require differing treatment approaches—for example, online shopping compared to excessive computer games playing. The inventory could be tabulated by an observing parent, by the child themselves if deemed responsible to accurately complete it, or by an automated software package that scans and collates all web use over a specified time period. Repeating the process at a later date could prove useful in monitoring the condition, or in assessing the impact of treatment. Indeed, such is the pervasiveness and importance of ICT usage in the large majority of young Australians (Brand & Todhunter, 2015) that an Internet inventory could be a useful part of any client's appraisal and formulation, regardless of whether PIU concerns are present or not. One could call this the 'bio-psycho-cyber-social' approach in assessment.

As is the case with all psychological and physical disorders and illnesses, a consideration of where the client lies on the 'spectrum of severity' is vital in the formulation, and in then deciding on the indicated treatment-pathway. One could rate the severity of the condition on the score obtained on a structured questionnaire such as the Y-IADQ, in a similar way that depression or anxiety conditions are graded according to structured-survey scores; however, an appraisal of how severely impaired the client may be in his social role and daily functioning, and the presence of any co-morbid illnesses, are also highly important in this assessment.

A robust and sophisticated formulation will provide much guidance to optimal treatment directions. If co-morbid anxiety, depression, ADHD or other mental disorders are present, then this

should be actively and promptly treated, if necessary in conjunction with a child psychiatrist. Similarly, if self-esteem, identity, personality, or intra-familial difficulties are noted, then these should be appropriately addressed, including utilising an extended psychodynamic or narrative-based approach if indicated, or with family therapy. Perhaps understandably, the research in the treatment domain of PIU is, by some distance, much less thorough and less developed than the research in other domains. Much of the literature (e.g., Beard, 2005) is based on sound clinical observations and judgement, modalities from other behavioural addictions therapy (such as pathological gambling), and on a thorough appraisal of the individual client, as noted above.

The structured treatment research to date has typically employed a cognitive behaviour therapy (CBT)-based approach, and a formal model of CBT for Internet addiction, CBT-IA, has recently been described (Young, 2011). This model, in a three-phase structured programme, utilises detailed Internet-use reporting, cognitive restructuring, harm reduction and supported behavioural change over 12 sessions. This model has been empirically tested in a sample of 128 young adults, both male and female (Young, 2013). Though lacking a control group, the study showed encouraging results with 95% of participants showing significant improvement in the Outcome Checklist upon course completion, and 78% participants maintaining success at 6-month follow-up. In an important earlier study of 56 adolescent students in Shanghai, China, this time randomised and controlled for (Du, Jiang, & Vance, 2010), a school-based group-CBT approach over eight sessions demonstrated significant improvements across all items on the Outcome Checklist (reduced Internet time, better time management, and reduced emotional and behavioural symptoms); of note, improvements were again maintained at 6-month follow-up.

Given the potentially important role of the family and of parenting styles in the development of PIU, family therapy could be considered a useful treatment modality to investigate. To date, there has been one controlled study of family therapy in treating male adolescents with excessive online gaming problems (Han, Kim, Lee, & Renshaw, 2012). Fifteen families were assigned to a three-week family therapy programme, which resulted in improved family cohesion and reduced online gaming time, compared to 15 control families. There has also been one recent case report of the successful use of Bowen's family systems theory in the treatment of a young adult with Internet addiction and his family (Park et al., 2014).

Setting a clear and achievable 'outcome goal' is likely to be of key importance in the process of assessing, engaging and working with the teenaged or child client. General principles of optimising rapport with any child or teenager in the clinical setting should be followed, such as maintaining an empathic and genuine stance, avoiding a condescending or patronising attitude, being flexible and

patient during the history-taking process, and avoiding conflict and a negative or punitive stance. Added to this, knowledge about and an interest in youth online culture, website types, and gaming genres will assist in building a therapeutic relationship with a young client.

Of note, such age groups often demonstrate a less well-developed self-reflective capacity, and more resistance to change despite evidence observed by others, such as parents or teachers. It is also unreasonable to expect, for the current young generation where the Internet is an integrated and important part of their lifestyle, a final goal of 'total abstinence'. Thus, a balanced, pro-active and moderate use of the Internet and its modalities (e.g., gaming, social networking, general browsing, online shopping) may be the therapeutic target, with adverse impacts on the client's 'real world' activities such as sleep, social contact, education and physical activity kept to a minimum. Thus, families and carers are likely to play an important role in supporting the therapist and client in reaching those goals, in monitoring the maintenance of the 'healthy digital diet' and in looking for signs of any relapse after the structured intervention has been completed. Staff at the client's school, such as teachers and school counsellors, will also have an important role, and indeed may be amongst the first to become aware of emerging PIU issues, well before a referral to a child psychologist might be considered. In a recent unpublished survey of 120 school counsellors in the Sydney region (Tam, 2012), PIU issues were rated as amongst the most common novel presenting disorders seen by school counsellors, were considered as 'hard' or 'very hard' to address and treat by 65%, and about 5% of respondents reported having been referred at least 50 separate cases in their recent school-based work.

Conclusions: Towards an Integration of Current Knowledge and Perspectives

As has been described above, in the two decades since the first descriptions of PIU stimulated both clinical and research interest in the topic, there has been a wealth of informative, powerful and useful literature from the widest 'whole population' level, down to the neurostructural level. As has been the case with many complex psychological and psychiatric conditions, active debate and controversy has often resulted from clinical and research discoveries, but such debate is to be encouraged if there are to be robust, valid, and internationally-accepted standards in the appraisal, research and treatment of affected patients. Much research and clarification is still required, as the foregoing review suggests. Some key areas for such future endeavours would include:

- Establishing collaborative, international longitudinal studies to address prevalence, co-morbid and other associated factors (such as personality and parenting variables), and which employ valid and consistent measurement tools.

- Prospective studies looking at potential protective factors in the future development of PIU, such as personality aspects and parenting styles.
- Longitudinal studies examining any association of PIU with the future development of other addictive behaviours, as has been speculated (Griffiths, 1999).
- Long-term, multi-centre treatment studies employing a range of treatment modalities, thus facilitating a more sophisticated approach of matching treatment to the typology of the PIU and client characteristics, and comparing the treatment modalities' success rates and effectiveness.
- Prospective NI and neurophysiological studies, examining the emergence and development of any neurobiological changes in PIU subjects, particularly in the younger age range.
- Further exploration of the potential positive effects of games and ICT usage, such as on physical health, well-being, and cognitive capacity.

In summary, the cyberworld into which current generations are born is certain to evolve, and to change and challenge individuals and societies, in ways that may not be possible to predict. Assessment of clients, and their families, will necessitate a holistic, multi-faceted, empathic approach exploring many domains from the psycho-emotional to the interpersonal, familial and ecological; physical health and wellbeing considerations will also be important, in the construction of a sophisticated case formulation. Such a formulation must also be open to addition, alteration and even full reconstruction, as the habits and behaviours of a client (both on- and off-line) alter over time. Whilst this near-limitless world is empowering, invigorating, incredibly fast and accessible, there is still hope that those in 'Generation Wired' can, at times, move beyond computer gaming, the 'selfie' and other enticements of the World Wide Web, and spend more time interacting with the 'Real Wide World' beyond the pixels.

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