SCOPING REVIEW OF INTERNET GAME ADDICTION WITH A FOCUS ON THE RISK, PROTECTION, IMPACT FACTORS, AND INTERVENTION PROTOCOLS

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ABSTRACT

Background: Internet game among adolescents seems problematic and has been associated with various psychosocial problems such as aggressive behavior, insomnia, and self-centeredness, as well as being easily petulant, hot-tempered, disobedient to parents and violent. Additionally, these adolescents are more likely to steal their parents' money, develop poor money management skills, and display other negative forms of behavior associated with an imitation of violent game behavior and engaging in aggressive speech.

Aims: This study aimed to conduct a scoping review of articles published on internet game addiction to understand what evidence exists of the protective, risk and impact factors of game addiction following the intervention protocols related to the specified topic.

Methods: The standard method of scoping review was applied. Inclusion criteria were Thai and English articles that had been published online during 2012-2017. The participants were adolescents aged 13-18 years old. Notably, non-empirical studies, theses, book reviews, and commentaries were excluded from this scoping study. The databases CINAHL, Google Scholar, and Thai journal online were employed to search for the articles using the key phrase “internet game addiction” at the initial step. Six hundred and sixty titles were retrieved from the database. Three authors read the titles and abstracts and then selected the relevant articles related to the topic. Ultimately, eighty-four articles were included. In the second step, the inclusion criterion was applied, and non-relevant studies were excluded. For the third step, the selected references were then listed, and the full-text articles were obtained.

Results: The authors included 18 studies for review that consisted of mixed method, descriptive cross-sectional and experimental studies. Primarily, papers published in Thailand were selected (7 articles), followed by those published in China, Turkey, Norway, Germany, Greek, Hong Kong.

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2 Correspondence concerning this article should be addressed to Kulnaree Hanpatchaiyakul at Email: kulnaree@bcnnon.ac.th and kulanree1122@gmail.com
and South Korea. A common theme across the description of the risk factors of Internet game addiction of adolescents was related to the functionality of the adolescents’ families, as well as their self-efficacy, and attitudes toward computer game playing and gambling. The protective factors included education attention switching activities. The impacts of internet game addiction were associated with depression, psychological trauma, decreased academic achievement, misuse of time and money, and social problems related to the act of gambling. The cognitive behavioral assessment was promoted for the treatment.

**Conclusion:** Internet game playing can partially mediate the effects associated with the risks and protective factors of internet game addiction. The relevant implications for research and practice will be discussed.

**Keywords:** internet game addiction

**Background of the study**

Excessive Internet game addiction among adolescents has become a prevalent type of behavior problem worldwide. Problems associated with internet game has become even more severe as the internet has come to be seen as a necessity in daily life. Internet helps students to broaden their academic knowledge by providing them with access to a global database of information and by also allowing them to communicate with the academic community easily. The internet has become a valuable source of information (Cheung & Wong, 2011) that can be used by students to retrieve useful information in conducting research. However, the popularity of online games among the current generation has probably increased the size and scope of the problem of Internet over-use. This increasing trend of Internet game use has led to the initiation of (private and public) treatment programs that target gaming addiction. Consequently, there has been an increasing amount of research that has focused upon Internet game addiction. As computer use and access to the Internet have become a staple of everyday life, the potential for serious overuse with a significant chance of leading to addiction, has also been introduced. Research on Internet addiction has shown that users can become seriously addicted to it. Addiction to the Internet shares some of the negative aspects of substance addiction and has been shown to lead to other negative consequences, such as reduced school performance and family and relationship problems (Briand & Peter, 2005).

The study of computer game addiction among adults in Thailand has received little attention. However, there have been several recent studies that have shown that the prevalence of computer game addiction among adolescents was approximately 13.5-15 % (Pornnoppadol et al., 2009; Hongsanguansri & Pavasuthipaisit, 2006). Similarly, in Slovenia, the prevalence of daily Internet use among the adult population was 59.9%, while 3.1% were at risk of becoming problematic Internet users and 11% of these people were in the age range of 20 to 24 years. According to current statistics, those individuals being at risk of becoming problematic Internet users are typically younger (Macur et al., 2016).

Internet use among adolescents seems significantly problematic, and a correlation to various psychosocial problems has been identified such as aggressive behavior. Studies have shown that the students who use the Internet extensively are prone to becoming self-centered, easily petulant, hot-tempered, disobedient to parents, violent, and would be more likely to steal...
their parents' money and possibly fall into debt. They also displayed a tendency to change their behavior in more anti-social ways, such as by imitating violent game behavior and speaking aggressively (Thumthong, 2012). Researchers from Hong Kong have explained that there is high comorbidity between Internet addiction and insomnia. Both insomnia and Internet addiction take place along with various significant explanatory factors, but they tend to exert certain differential effects of depression (Cheung & Wong, 2011).

Young (1996) studied the pathological nature of Internet use by using pathological Gambling as a model. It has been determined that Internet addiction can be defined as an impulse-control of all the diagnoses referenced in the DSM-IV (American Psychiatric Association, 2000). Since then, the differences in conditions of both name and criteria have been put forward to capture the problem, which is now most popularly known as Internet Addiction Disorder (Cash et al., 2012).

The purpose of this study is to provide a scoping review of the research. A scoping report documents the research to date in a topic area, with a goal to summarize research findings and to identify gaps in the existing literature. Throughout the literature there is little to guide practitioner and policy maker service planners about the choices or issues that adolescents with Internet game addictions face. As the incidence of game addiction rises against an apparent policy vacuum, it is timely and relevant to examine the research evidence that exists about mapping the study of risk, as well as the protective and impact factors following the interventions.

Research questions

1. What are the risk, protective and impact factors of internet game addiction?
2. What is the intervention protocols related to internet game addiction?

Aims

This study aimed to conduct a scoping review of articles published on the subject of Internet game addiction to understand what evidence exists regarding the protective, risk and impact factors of game addiction following the intervention protocols that are related to the specified topic.

Methods

The scoping review was applied to provide an overview of the evidence and a map of what evidence has been produced on this topic, as opposed to seeking the best available evidence to answer a particular question that is related to policy and practice (Joanna Briggs Institute, 2015). The inclusion criteria are made up of the following:

1) The research findings must be published in a peer review journal from 2012 to 2017,
2) The participants be adolescents (between the ages of 10 to 22 years old),
3) The article be written in Thai or English and

4) The author of the article must have studied phenomena related to video or online game playing. Additionally, non-empirical studies, theses, book reviews, commentaries, and policy analyses must be excluded from the scoping study. This paper considered primary research studies that are related to the qualitative and quantitative study.

**Search strategy**

The search strategy for a scoping review aims to be comprehensive to identify the relevant primary studies. A three-step search strategy is to be applied. The first step is an initial limited search of three online databases that are relevant to the topic. The databases CINAHL, Google scholar and Thai journal online are appropriate for a scoping review on game addiction among adolescents. An initial search found 660 titles, and this was followed by an analysis of the text words contained in the titles and of the index terms used to describe the articles. A second search using game addiction terms as well as the phrases online and internet game addiction was then undertaken across all of the included databases, along with 84 abstracts of the retrieved papers. Thirdly, the inclusion criteria were applied to select 18 articles from the database. One article was retrieved from CINAHL (1), eleven articles were retrieved from Google Scholar (11), and seven were retrieved from Thai journal online (7) for analysis. A reference list of all identified original research studies will be searched for additional studies.

**Results**

According to the Joanna Briggs Institute (2015), data is to be made up of individual tables constructed for analysis. The authors extracted the information that was related to answering the research questions. A total 18 of articles related to internet game addiction were retrieved from the database for analysis about the question of the study. (CINAHL, Google scholar, Thai journal online).
Figure 1 Breakdown of articles retrieved from CINAHL, Google scholar, Thai journal online

- (660) Cinahl (43), Thai Journal online (28), Google scholar (202)
  - Duplicated articles and non-relevant abstracts were excluded.

- (84) Cinahl (8), Thai journal online (18), Google scholar (58)
  - Articles were selected following the inclusion criteria

- 18 articles of eligibility were chosen for this study

- (3) Intervention
- (15) Risk, Protective and Impact factors
Table 1 Summary of 18 detailed articles included in the review

<table>
<thead>
<tr>
<th>Domain of interest</th>
<th>First author/year</th>
<th>Country</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Kim (2016)</td>
<td>South Korea</td>
<td>Quasi-experimental research</td>
</tr>
<tr>
<td></td>
<td>Huanhuan, (2013)</td>
<td>China</td>
<td>Mixed-method, Descriptive, Randomize control trial</td>
</tr>
<tr>
<td></td>
<td>Jäger, (2012)</td>
<td>Germany</td>
<td>Randomized control trial</td>
</tr>
<tr>
<td>Risk and preventive factors</td>
<td>Li (2016)</td>
<td>China</td>
<td>Cross-sectional study</td>
</tr>
<tr>
<td></td>
<td>Öztürk (2015)</td>
<td>Turkey</td>
<td>Cross-sectional, study</td>
</tr>
<tr>
<td></td>
<td>Kolkijkovin (2015)</td>
<td>Thailand</td>
<td>Cross-sectional study</td>
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<td></td>
<td>Srivichai, (2015)</td>
<td>Thailand</td>
<td>Correlation predictive research</td>
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<td></td>
<td>Prachaney (2014)</td>
<td>Thailand</td>
<td>Cross-sectional study</td>
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<td></td>
<td>Vollmer, (2014)</td>
<td>Turkey</td>
<td>Correlational Research</td>
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<tr>
<td></td>
<td>Charoenwanit (2014)</td>
<td>Thailand</td>
<td>Correlation predictive research</td>
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<tr>
<td></td>
<td>Siomos (2012)</td>
<td>Greek</td>
<td>Cross-sectional study</td>
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<td></td>
<td>Xu (2012)</td>
<td>China</td>
<td>Cross-sectional study</td>
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<tr>
<td></td>
<td>Zou, (2012)</td>
<td>China</td>
<td>Correlational Research</td>
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<tr>
<td></td>
<td>Thumthong (2012)</td>
<td>Thailand</td>
<td>Mix-Method</td>
</tr>
<tr>
<td>Impact factors</td>
<td>Oskenbaya, (2016)</td>
<td>Hong Kong</td>
<td>Correlational Research</td>
</tr>
<tr>
<td></td>
<td>Srivichai, (2014)</td>
<td>Thailand</td>
<td>Correlation predictive research</td>
</tr>
<tr>
<td></td>
<td>Brunborg (2014)</td>
<td>Oslo Norway</td>
<td>Descriptive study</td>
</tr>
<tr>
<td></td>
<td>Boonyasana (2012)</td>
<td>Thailand</td>
<td>Descriptive study</td>
</tr>
</tbody>
</table>

Table 1 summarizes the extractions of the articles used in this review. The summary detail of the articles provides pertinent information including the domain of interest, first author/year, country of study and methodology. The intervention protocols include a study of quasi-experimental research and two studies of a randomized control trial. The research domain advocated with the risk, protective and impact factors of online game addiction included six cross-sectional studies, three correlational research studies, three correlation predictive research studies, two descriptive studies and one mixed-method research study.

A common theme identified across a description of risk, protection, impact factors and intervention protocol of adolescents experiencing Internet addiction were explained about the articles included in the scoping review.

Risk and protection factors of adolescents experiencing Internet addiction

Findings obtained from the scoping review demonstrated that gender was associated with game addiction, and male adolescents had higher computer game addiction scores than female adolescents (Vollmer, et al. 2012; Huanhuan et al. 2013; Srivichai et al. 2015; Li et al., 2016). Male adolescents reported having more positive feelings after playing computer games, and thus, computers are regarded as being more of a toy for males than for females. Online gaming is not
only a youth-culture phenomenon but is also a component of college social life. As such, males and females may experience different levels of motivation for and enjoyment of game playing.

Family studies conducted in Thailand and Greece indicated that family communication routines are associated with internet game addiction. The findings indicate that Thai-teenagers who live with protective families and within autocratic rearing models tend to experience higher degrees of online addiction than those from consensual families (Charoenwanit, & Sumneangsanor, 2014; Siomos et al., 2012). Consistent with the Greek study, it was found that the best predictor variables for Internet and computer addiction were parental bonding variables and not parental security practices. The protective factors associated with game addiction involved the mother’s and father’s care for the individual while overprotection was correlated with the Internet and computer addiction (Siomos et al., 2012). Regarding prevention and harm reduction factors of adolescents Internet game addiction Chinese researcher found that attention switching, perceived cost, and education/rationalization reduce game playing (Xu, cruel & Yuan, 2012). Siomos et al. suggested that parents tend to underestimate the level of computer involvement when considering their children. Poor parenting is an essential part found in addictive phenomena, such as with alcohol addiction, and this appears to be the case with the Internet and PC addiction. Parental supervision and security precautions have been found to be beneficial rather than restrictive. The three online activities most associated with Internet addiction were watching online pornography, and participating in online gambling and online gaming.

Regarding the risk factors associated with basic educational institutions for youths in the northeast of Thailand, it was found that attitudes toward computer game playing directly affected the game addiction behavior of those youths. Thumthong, (2012) found that the context of the educational institutions that the youths attend influenced whether students become addicted to computer games. This was notably the case when it was seen that it was easy for students to leave the school grounds or when the school had computer games for students to play through the use of the school Internet laboratory, and especially when the teachers did not bother to check on how the students were using those computers. The external basic educational institution contexts influencing students who experienced game addiction included the condition that many computer game cafes were located near the schools and the school personnel was also found to be directly involved in ownership or management of the game cafes. In this situation, the students were able to conveniently use these services at affordable rates at any time of day without limitations on age and time for playing. Similar findings found that the risk factors for computer game addiction among adolescents included situations where convenient access to internet game computer in adolescent’s home, shops and cafes was available to the adolescents. This was the case when the locations for playing computer games were either near the neighborhoods of their homes or the school grounds of their learning institutions, as was stated by Kolkijkovin et al., (2015). Additionally, the game playing shops were intentionally well hidden from public view, and the proprietors would not restrict any particular groups of customers (Thumthong, 2012).

In addition, the findings of the Turkish studies found a significant influence of personality trait on computer addiction (Vollmer, 2014; Öztürk et al., 2015). This result was consistent with that of a Chinese researcher who found that neuroticism was correlated with
online game addiction (Li et al., 2016). The researcher also suggested that introverted people usually have poorer social networks and experience a greater degree of rejection by their peers. On the one hand, introverted people may instead express themselves and their feelings by playing computer games, or on the other hand, they may compensate for or eliminate their feelings of loneliness while playing computer games (Vollmer, 2014).

Oskenbaya et al. (2016) stated that there was an association between psychological trauma and computer game addiction. In other words, childhood trauma is considered the primary factor in someone with a predisposition for any addiction. Painful past experiences among children can have an impact on adolescents' lives and their personal growth. The author in this study discussed how a relationship with the primary cause of any addiction is derived from psychological trauma, and that by finding such underlying reasons it can help understand a particular need by an individual to gamble. Relevant psychological problems are also explained by Li et al. (2016), who stated that stressful life events are an important predictor of online game addiction among Chinese adolescents.

**Impacts on adolescents who experience Internet game addiction**

Little has been revealed by searches for studies on the effects on adolescents who have experienced Internet game addiction due to problems associated with the searching methods and the keywords used in the searches. However, the authors found that the problems related to adolescents who experience game-addiction included behavioral changes, low academic achievement, poor use of time and poor money management skills.

Early adolescents who use computers excessively may be faced with behavioral health problems such as getting a lack of exercise, having improper diets, experiencing sleeping problems and the abuse of alcohol or other substances (Srivichai 2014). Thumthong, (2012) stated that the negative impacts of Internet game addiction include those associated with schooling, health and personality development. The schooling impacts involved having a short memory, displaying low academic achievement, being excessively absorbed in games, and having no interest in learning. The health impacts include being pale and thin, having eye-sight disorders, getting no physical exercise, and feeling exhausted. The personality impacts of computer game addiction include aggressive behaviors, being self-centered, becoming easily petulant, being hot-tempered and disobedient to parents, being violent, stealing money from parents, poorly managing expenses and negative changes to personality behaviors, such as by imitating negative or violent game behaviors and speaking aggressively.

However, parents would often underestimate the amount of time spent playing Internet games by their children (Siomos et al., 2012). Moreover, a study from Norway found that video game addiction was associated with higher levels of depression, poorer academic achievement, and increased problems related to an individual's conduct. Findings in the study also showed that the amount of time spent gaming is not necessarily associated with the negative outcomes. These results have implications for future research that are aimed at studying the causal links between video game addiction and related adverse consequences (Brunberg, Mentzoni & Froyland, 2014).

The impacts of online gaming that are related to economic problems were found in Thailand. This was seen to be the case as teenagers in Thailand tend to spend more money on the game playing at a variety of game shops and many youths sneak out of their homes to play games and then become at risk of falling victim to other societal problems. The games are attractive, realistic, have interesting features, and use high technology, while the game playing
locations are easy to find. All of these factors contribute to the motivation of Thai youths to become hooked on game playing. The reasons for game playing were typically associated with feelings of fun and enjoyment, feeling bored, and the opportunity to exercise one’s brain by playing these games (Boonyasana & Punnarong, 2012).

**Interventions for Internet gaming addiction**

The interventions associated with Internet game addiction among adolescents are rare. Cognitive Behavior Therapy was utilized in two studies, one in Germany (Jäger et al. 2012) and another in China (Huanhuan & Su, 2013). The authors of this research selected one study from Germany involving adolescents and adults in group experiments in randomized control trials because studies on adolescent Internet game addiction are rare. Such interventions are relevant to the topic of Internet game intervention as patients are assured of receiving full treatment after a waiting period of four months following randomization. However, a follow-up study involving the waitlist control groups was not possible. The use of a waitlist control group appears to be justified because of the novel treatment approach employed and the lack of other comparable methods. The study in China applied a CBT procedure with 12 session courses over six weeks, and the control group was interviewed twice per week. The researcher stated that about the efficacy of the CBT. That only the primary results should be considered due to a lack of data obtained in the follow-up sessions (Huanhuan & Su, 2013).

One study from Korea adopted prevention programs among specific groups of multicultural children. A set of eight sessions of prevention programs was administered to the experimental group. Each session time consumed 70 minutes, which consisted of three steps involving the introduction, development, and closing stages. The interventions have shown that prevention programs help reduce the degree of addiction among multicultural children to Internet games (Kim, 2016).

**Conclusion**

The scoping review was employed to address the current state of knowledge in the area of internet game addiction. A total of 18 articles related to internet game addiction were retrieved from three databases including CINAHL, Google Scholar, and Thai journal online. Based on the studies reviewed, it is clear that the risks associated with the proactive and impact factors were related to personal, family and school determinants. However, the studies were limited regarding the interventions protocols for adolescents who experienced internet game addiction. Future implications of this study will be necessary for a study of the various protocols of Internet game addiction interventions among schools and healthcare services. Regarding patient care, it will be essential to implement an effective treatment plan for Internet game addiction within a clinical routine.
References


