Problematic Internet Use, Online Gaming, and Online Gambling, and Their Relationships with Depression and Quality of Life among College Students

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This dissertation titled

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Abstract

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with Depression and Quality of Life among College Students

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Young adults on college campuses are surrounded by information and communications technology and have limitless access to the Internet on college campuses. The purpose of this study was to explore the prevalence and extent of problematic Internet use, online gaming behavior, and online gambling behavior, and their relationships with depression and quality of life among college students. The study utilized a non-experimental cross-sectional research design employing quantitative research methodology.

The current study aimed to answer two research questions: (a) Is there a relationship between depression and a linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students? and (b) Is there a relationship between quality of life and a linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students?

Results of the first research question indicated that the IAT statistically significantly predicted depression. Results of the second research question also indicated that IAT statistically significantly predicted quality of life. Problematic Internet use was positively correlated with depression and negatively correlated with quality of life. Although online gaming was significantly correlated with depression and quality of life, it did not predict depression and quality of life among college students. Online gambling was also significantly correlated with quality of life, but did not predict quality of life among college students. Supplemental analyses showed the similarities and differences between undergraduate and graduate level, and male and female students on their IAT, POGQ, OGSAS, BDI-II, and WHOQOL-BREF scores. Weekly Internet usage statistics were also presented and showed usage time differences between undergraduate and graduate, and male and female students. The findings of the current study contribute to understanding problematic internet use, online gaming and online gambling in college students but must be considered in the light of limitations of the study. The study helps inform clinical practice and the treatment of problematic internet among college students.

Dedication

To my father, my mother, and to the loving memory of grandmother and my uncle, who have believed in me and supported me in all my endeavors and adversities.

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Chapter 1: Introduction

Introduction of the Study

This chapter provides an introduction to the study examining problematic Internet use (PIU), online gaming behavior, and online gambling behavior among college students. Further, the chapter includes the background of the study, statement of the problem, purpose of the study, theoretical perspective, significance of the study, research questions, and hypotheses, definitions of terms, and a summary of the chapter. The purpose of this study was to explore the prevalence and extent of problematic Internet use, online gaming behavior, and online gambling behavior, and their relationships with depression and quality of life among college students at a large public university in the mid-west. The study examined problematic Internet use, online gaming behavior, and online gambling behavior together as independent variables among a specific population, college students. This combination of independent variables has not been examined in previous studies, and is likely to be of value to counselors and higher education professionals working with college students who typically utilize information and communications technology extensively (Cotten, 2008; Gemmil & Peterson, 2006; Massimini & Peterson, 2009).

Background of the Study

Almost all age groups use the Internet in today's world (Pew Research Center, 2010, 2014a). As reported on the Internet World Statistics website (2017) about 49.6% of the world's population uses the Internet, showing a growth rate of 933.8% since 2000. However, this does not mean that Internet use is common all around the world. For

example, Internet use is below 30% of the population in many countries on the global level in places, such as Kenya, India, and Pakistan (Pew Research Center, 2015, p. 13). On the other hand, in the United States, 88.6% of the population uses the Internet (Internet World Statistics, 2017), and 94% of young adults, ages 18-29, go online several times a week (Pew Research Center, 2014b). Young adults connect to the Internet for varied and various purposes, such as education, communication, information gathering, and leisure such as gaming, gambling, and social media. The literature differentiates the use of Internet into two categories "problematic and non-problematic" (Aboujaude, 2010; Young, 1996, 1998b).

Moderate use of the Internet is defined as going online less than two hours a day and more than five days a week (Cassidy-Bushrow, Johnson, Peters, Burmeister, & Joseph, 2015) for the purpose of information gathering (Romer, Bagdasarov, & More, 2013). Moderate use of the Internet has several advantages. For instance, moderate Internet use may positively affect people's participation in social activities through teams or clubs, such as extracurricular activities and book reading (Romer et al., 2013). Chen (2012) has found positive effects of Internet use in terms of social relationships. For example, people on the Internet are not only going online in order to acquire information, but also to meet their social needs, including "chatting, discussing, arguing, and confiding" (Sproull & Faraj, 1995, p. 65). Internet users have more freedom in the online world due to privacy and absence of demographic information and non-verbal cues. People may feel less discomfort when communicating with others online (Caplan & Turner, 2007, p. 989; Chen, 2012, p. 2219). Young people also seek out information online in order to cope with mental health issues without being labeled or stigmatized (Burns, Durkin, & Nicholas, 2009).

Cotten (2008) suggested that being able to access the Internet helps college students make their transition to higher education easier by improving communication, lessening ambiguity, and promoting online connection (p. 67). In addition, Kang (2007) and Shaw and Gant (2002) suggested that moderate Internet use and online communication may decrease depression and loneliness, and might increase feelings of happiness, self-esteem, and social support. Amichai-Hamburger and Furnham (2007) supported the argument and their results showed that when the Internet is used appropriately, it might improve the user's psychological well-being and quality of life.

However, people sometimes use the Internet longer than intended, overly or heavily, which brings some negative effects to people's lives (Spada, 2014). According to researchers, overuse of the Internet is defined as going online for more than 20 hours a week (Ko, Yen, Yen, Lin, & Yang, 2007) and using the Internet more than 2 hours a day every day (Cassidy-Bushrow et al., 2015). Overuse of the Internet may be linked to mental health problems, such as depression and loneliness (Young, Yue, & Ying, 2011) and might have a negative impact on the user's quality of life. Heavy users of the Internet may manifest behavioral symptoms of psychological dependence, including withdrawal symptoms, insomnia, and craving (Young et al., 2011). Young (1998b) described excessive Internet use as a condition in which individuals lost control of the Internet use while neglecting responsibilities and disrupting relationships despite experiencing negative outcomes of excessive use (p. 241), such as avoiding daily life activities (Caplan, Williams, & Yee, 2009, p. 4).

Negative Outcomes of Problematic Internet Use

As much as computer use and the Internet offer advantages in our daily lives, they might also cause negative consequences depending on how much they are being used and for what purpose. For instance, in a study with the Korean population, researchers reported that an Internet dependent group displayed higher levels of "depression, loneliness, and compulsiveness" compared to people who were not dependent on the Internet (Whang, Lee, & Chang, 2003, p. 148). Ceyhan and Ceyhan (2008) reported that depression, loneliness, and computer self-efficacy are linked to increase in problematic Internet use (p. 700).

The Internet is also frequently used as a communication tool via various applications. As much as people feel more comfortable due to its anonymity, such online communication might have some disadvantages. Green et al. (2005) stated that the absence of non-verbal communication, in person social support, and physical contact in online communication might be problematic, and is perhaps a link between problematic Internet use and psychological well-being. Some researchers have indicated that people who feel lonely or anxious in social situations often use the Internet in order to communicate with strangers online and avoid face-to-face communication (Gross, Juvonen, & Gable, 2002; Ybarra, Alexander, & Mitchell, 2005; see also Brown & Bobkowski, 2011). However, having more online than offline interactions might result in increased social isolation in the long term (Davis, 2001, p. 193) and may have psychopathological effects, such as depression or isolation (Bell, 2007). These research findings establish a link between problematic Internet use and psychological well-being.

Problematic Internet use not only affects psychological well-being, but also may lead to a decrease in quality of life. For instance, excessive use of the Internet might cause a negative effect on face-to-face interactions due to a decrease in time spent with friends, family, or significant others, hence decreasing quality of life and psychological well-being (Kraut et al., 1998, p. 1028). Green et al.'s (2005) findings indicated similar results and stated that having online relationships might lead to a decrease in social interactions outside of the online environment that could negatively affect psychological well-being and interpersonal communication.

Problematic Internet use could be seen in various forms and might exhibit addictive behavior patterns, such as excessive use, withdrawal, tolerance, and negative repercussion (Block, 2008, p. 306). Problematic online gaming behavior and problematic online gambling behavior are two manifestations of problematic Internet use. According to O'Brien (2010), Internet activities, such as online gambling or online gaming, may activate a reward system in the brain as strongly as do addictive drugs and alcohol (see also Potenza et al., 2003). Many activities on the Internet produce pleasurable effects that create a strong tendency to repeat them. This positive reinforcement pattern follows the operant conditioning principles that increase use of the Internet because of its pleasurable nature (Potenza et al., 2003, p. 832). Therefore, Internet addiction was proposed to be included in the Diagnostic and Statistical Manual of Mental Health Disorders-5 (DSM-5) as an appendix for further study (Greenfield, 2011; O'Brien, 2010). It was also proposed as a compulsive-impulsive spectrum disorder that includes online and offline use of the computer (Block, 2008). Despite these views of the addictive or obsessive nature of Internet use, Internet addiction was not included in the DSM-5 as a disorder (American Psychiatric Association [APA], 2013). After discussing problematic Internet use and its problematic features, online gaming behavior and potential issues related to problematic online gaming will be discussed as another aspect of the present study.

Online Gaming

Online games are increasingly popular with children, adolescents, and young adults. People play online games for various reasons, such as escaping from a stressful situation or viewing online gaming as a stress management option (Snodgrass et al., 2014). People with less stress may play online games in order to enhance their offline lives. On the other hand, people with high stress may play online games problematically as an option to get away from their offline problems (Kraut et al., 2002; Snodgrass et al., 2014). When people engage in problematic online gaming, their engagement in daily life activities, such as job, school, social life, and family, and their general daily functioning may suffer (van Rooij, 2011). Problematic online gamers may also try to fulfill needs that may feel are unattained in the offline world (Khan & Muqtadir, 2014). With the increasing prevalence of online gaming and some associated problems with online gaming, problematic online gaming was proposed to be included in the DSM-5 in Section III as "Internet Gaming Disorder" (APA, 2013, p. 795).

Online gaming takes place for different reasons and might cause long-term effects both behaviorally and psychologically. For instance, some researchers have shared concerns that being exposed to online games, particularly violent games, could make players less sensitive to violence in the long term (Ballard, Hamby, Panee, & Nivens, 2006). Bax (2011) also reported that dysfunctional online gaming may come as a reaction to family pressure to succeed, with high scores among people in China (see also Kirmayer, Raikhel, & Rahimi, 2013).

Snodgrass et al. (2012) reported that massively multiplayer online game (MMOG) players have a high potential of experiencing problematic usage, behavioral patterns, and addiction because players were most likely driven by success, in-game goals or achievement, and aspiration of competition instead of socializing and interacting with others in online environment (p. 21). On the other hand, offline games might create opportunities outside of online gaming area. For instance, players who played offline games were found to be most likely to be able to transfer their in-game experiences and accomplishments to their social networks outside of the game environment. These players also reported less problematic and less stressful relationships than those who played online (Snodgrass, Lacy, Dengah, Fagan, & Most, 2011). Online gaming and its potential negative effects have been briefly discussed. In addition to online gaming, online gambling might also present dysfunctional behavior patterns depending on the use. The following section discusses online gambling behavior.

Online Gambling

Online gambling is simply defined by Business Insights (2010) as an entertainment in the virtual world, that has increased in the past decade (Matthews, Farnsworth, & Griffiths, 2009). Petry and Gonzalez-Ibanez (2015) have indicated that

online gambling is popular among college students and is associated with problematic gambling. Griffiths, Parke, Wood, and Rigbye (2010) noted that online poker is becoming an alternative to traditional poker and is one of the fastest growing types of online gambling; however, the research is limited on online gambling. In Griffiths et al.'s (2010) study on problematic gambling behavior among university students, they reported that online gamblers, who played regularly and for a long time, did not adhere to a budget and misreported their biological sex while gambling online. Griffiths et al.'s report showed these behaviors were predictive of problematic gambling. Matthews et al. (2009) found approximately one in five online gamblers (19%) in their study met the criteria for a pathological gambler using the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987).

Although online gambling is legal in New Jersey under the Internet gaming regulations (Division of Gaming Enforcement, 2013), in Delaware (Delaware State Lottery Office, 2014), and in Nevada (Nevada Gaming Commissions and Nevada Gaming Control Board, 2015), online gambling in the US is largely prohibited because one of the main objections to online gambling is that it leads from gambling behavior to addiction (Haerens, 2012). However, online gambling in some forms remains legal in some states (National Conference of State Legislatures, 2014; Wyatt, 2011). The DSM-5 recognizes problematic offline gambling behavior as "Gambling Disorder" (APA, 2013, p. 585). However, there are no diagnostic criteria for problematic online gambling behaviors. Previous sections discussed three dysfunctional online behaviors as the focus of the present study (problematic Internet use, online gaming behavior, and online gambling behavior). The following section discusses maladaptive cognitions and their relationships with problematic Internet use.

The Cognitive-Behavioral Model of Problematic Internet Use

Problematic Internet use has been conceptualized through the lens of the cognitive-behavioral model by Davis (2001), who specified two distinct types of problematic Internet use. The first type is "specific pathological Internet use" in which users are hooked on a specific activity on the Internet, such as gambling, gaming, social media, facebook, compulsive shopping, and pornography. The second type is "generalized pathological Internet use" in which users overuse the Internet while doing Internet browsing without a specific purpose (Davis, 2001, p. 188). Davis suggested a cognitive-behavioral model in order to identify the etiology of problematic Internet use. In this model, problematic cognitions are seen as solidifying the maladaptive behaviors associated with problematic Internet use. Davis focused on maladaptive cognitions, such as "ruminative cognitive style, feelings of self-consciousness, low self-worth, a depressogenic cognitive style, low self-esteem, and social anxiety" (p. 189) as the main cause of problematic Internet use similar to Aaron Beck's cognitive theory of depression that suggested the individual's problems mainly derived from distortions and erroneous assumptions (Beck, 1976). Young (1996) focused on the behavioral elements of problematic Internet use, but not on the cognitive components of the issue.

Cognitive Behavioral Therapy to Address Problematic Use of the Internet

Due to free access to the Internet on college campuses, students have a greater potential to experience negative consequences and symptoms of problematic Internet use (Chen, 2012), such as experiencing depression, loneliness, and other emotional and psychological issues (Ceyhan & Ceyhan, 2008). Hence, Young (2011a) suggested a three-phase treatment approach for problematic Internet use. In the first phase, behavior modification can be used in order to decrease the time spent on the Internet. In the second phase, cognitive therapy can be used in order to point out what users are denying and help them realize how they justify their excessive Internet use. In the third phase, coexisting issues of the users can be identified and treated (p. 306).

In order to treat problematic Internet use, Greenfield (2001) suggested that Internet use should be moderated and/or controlled. Young (2007) specifically suggested cognitive behavioral therapy (CBT) as the preferred form of treatment for problematic Internet use. The primary goal of the CBT is to help users abstain from problematic use while maintaining controlled use of the Internet for reasonable purposes, such as school or work tasks (Young et al., 2011).

Young (2011b) provided guidelines for clinicians treating clients with problematic or addictive Internet use. The first question clinicians should ask is if this is the client's first time experiencing an addictive behavior to something or if there is any history of addiction (Young, 2011b, p. 26). According to Young, individuals with Internet addiction frequently experience other types of addiction as well. Although addicts may believe that Internet addiction is safer than other addictive behaviors, such as substances, because Internet overuse is seen as an alternative behavior that does not involve any kind of substance use (p. 26). However, Young stated that the relapse risk was highest among people with multiple addictions (p. 27). It can be particularly challenging to address problematic Internet use as people are in need of going online in order to complete their work or school tasks. Therefore, it is tempting to go back to the dysfunctional behavior and the feeling is relentless because the computer and the Internet are nearly ubiquitously accessible (Young, 2011b).

In order to evaluate cravings and signs of withdrawal, Young (2011b) suggested that several questions be asked, such as "Do you feel preoccupied with the Internet?" "How often do you think about going online?" "How often do you forgo other responsibilities or duties to go online?" "Have you ever used the Internet to escape from feelings of depression, anxiety, guilt, loneliness, or sadness?" (p. 28). Answers to these questions could help the counselor and the client understand more clearly the nature and extent of problematic Internet use. Also, the answers to these questions may indicate feelings that clients are dealing with or trying to escape by using the Internet (Young, 2011b). Moreover, the answers could help counselors identify withdrawal symptoms that could be a signal of problematic Internet use (Young, 2011b; see also Beck, Wright, Newman, & Liese, 2001).

Statement of the Problem

Young adults appear to be particularly attracted to the use of the latest technologies as a means to communicate, do homework, or gain pleasure via Internet related activities that provide an opportunity to interact with people in different ways while retaining anonymity in online environments and experiencing social acceptance and community bonds (Australian Communications and Media Authority [ACMA], 2007, p. 8; Caplan & Turner, 2007, p. 989). However, "what begins as a simple leisure activity can turn into more problematic forms of use until it becomes a real dependence with characteristics and symptoms similar to other, better-known forms of dependence" (Milani, Osualdella, & Blasio, 2009, p. 1). As seen, a helpful activity might turn into a problematic one. Therefore, the present study focuses on problematic features of Internet use and its possible effects on mental health and quality of life.

Two main elements have evolved regarding problematic Internet use in the literature. The first is on Internet addiction and the second is on the psycho-pathological effects of problematic Internet use, typically depression, lower level of quality of life, or social isolation related to time spent online (Bell, 2007). Kraut et al.'s (1998) study found that the time spent online was correlated with a lower quality of life and mental health concerns such as depression and loneliness.

Owing to free, ready, and unlimited access to the Internet on college campuses via a variety of wireless tools, students have the opportunity and possibly the tendency to use the Internet over time. Thereby, they have the potential to experience symptoms of problematic Internet use and related problematic online behaviors, such as immersion by staying online more than they intended, or experiencing negative consequences of problematic online activities (Chen, 2012, p. 2219).

The literature documents benefits and risks associated with the use of technology. Benefits include satisfying social needs (Chen, 2012), having anonymous conversations to relieve emotional stress (Caplan & Turner, 2007), and receiving social support (Shaw & Gant, 2002). Risks might include decreasing in-person relationships (Chen, 2012), and overall well-being while increasing depression and loneliness (Green at al., 2005). As the technology evolves, symptoms related to technology use and Internet use will continue to change because different uses of the Internet can create unique effects (Romer et al., 2013). Therefore, it is important to focus on and evaluate not only how time is spent online, but also how the Internet is used, such as who does online research instead of using social networking or playing online games or gambling online (Romer et al., 2013). Instruments exist to identify Internet addiction, problematic Internet use, and Internet-related problematic online behaviors. Many scholars have actively published their research findings for Internet addiction and Internet-related problematic behaviors to be included in DSM-5. However, the DSM-5 only suggests that these issues need to be taken into consideration, but does not identify them as diagnostic anomalies (APA, 2013).

Purpose of the Study

The purpose of this study was to explore the prevalence and extent of problematic Internet use, online gaming behavior, and online gambling behavior, and their relationships with depression and quality of life among college students in a large public university in the mid-west. The study aimed to contribute to the literature by using regression analysis methodology and combining problematic Internet use, online gaming behavior, and online gambling behavior as independent variables. The specific aims of this study were (a) to explore the relationship between problematic Internet use, online gaming behavior, online gambling behavior and depression; and (b) to explore the relationship between problematic Internet use, online gaming behavior, online gambling behavior and quality of life. Further, this study explored the relationship of demographic variables to problematic Internet use, online gaming behavior, and online gambling behavior.

Significance of the Study

The significance of this study is that it aims to add to the body of literature on the relationships between problematic Internet use, online gaming behavior, online gambling behavior, and depression and quality of life among college students. Findings also illuminate the relationship between demographic variables and problematic Internet use, online gaming behavior, and online gambling behavior.

Petry and Weinstock's (2007) study reported that 6.3% of college students (*n* = 86) were frequent Internet gamblers who gambled online weekly or daily. The authors indicated that online gambling was related to poor mental health status among college students, but no specific mental health issue was reported. Ceyhan and Ceyhan (2008) found a relationship between problematic Internet use and depression among college students. In addition, Cheng and Li (2014) stated in their meta-analysis study that problematic Internet usage prevalence was related to poor quality of life. Cheng and Li's study also predicted that people who had problems in their daily lives and had low quality of life had more motivation to go online to use online materials as a coping mechanism. Therefore, this study goes further and explores the relationship between problematic Internet use and quality of life among a specific population, college students. The current study examined the relationships between the independent variables of problematic

Internet use, online gaming behavior, and online gambling behavior with the dependent variables of depression and quality of life among college students.

The findings of the study could potentially inform counseling practice at college counseling centers and other mental health professional for online addictions. Findings will also likely provide significant knowledge for the treatment and counseling of college students who experience negative consequences of Internet use.

Definitions of Terms

Depression: a mood disorder that causes a persistent feeling of sadness, hopelessness, emptiness, irritable moods, and loss of interest (APA, 2013; Mayo Clinic, n.d., para. 1). *Quality of life:* "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" (The WHOQOL Group, 1998, p. 551).

Problematic Internet use: an impulse control disorder that does not involve an intoxicant (Young, 1998b, p. 238). Problematic Internet use also viewed as a behavioral addiction that interferes with daily life activities.

Online gaming: a form of gaming over the computer network (Demetrovics et al., 2012). *Online gambling:* a form of gambling using the Internet (Kim, Grant, Potenza, Blanco, & Hollander, 2009).

Psychological well-being: positive functioning and a multidimensional concept that includes "self-acceptance, personal growth, purpose in life, positive relations with others, environmental mastery, and autonomy" (Ryff, 1989, p. 1077).

Research Questions

Descriptive Question: What is the prevalence of problematic Internet use among college students?

Research Question 1: Is there a relationship between depression and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students?

Research Question 2: Is there a relationship between quality of life and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students?

Summary

This chapter provided background information and the importance of the research study. The definitions and issues related to problematic Internet use, online gaming behavior, and online gambling behavior were introduced along with the research questions. The existing literature related to Internet addiction and Internet related problematic behaviors are reviewed in the next chapter.

Chapter 2: Literature Review

Introduction

After stating the problem, providing the purpose of the current study, giving background information about the Internet, negative outcomes of problematic Internet use, online gaming behavior, online gambling behavior, and treatment models, this chapter covers various types of problematic Internet use and their effects on mental health. Several assessment screening instruments including the Internet Addiction Test, the Problematic Online Gaming Questionnaire, the Gambling Symptom Assessment Scale, the Beck Depression Inventory-II, and the World Health Organization Quality of Life-BREF are introduced and reviewed.

Brief history of the Internet. Over the past few decades, Internet technology has evolved and various types of Internet use have played an important part in our daily lives even though the personal use of it has a shorter history. The Internet is defined as a network system that connects computer systems called the "World Wide Web" (Schell, 2007, p. 1).

There is neither one history of the Internet nor of online gaming and online gambling (Crawford, Gosling, & Light, 2011), but there is a wealth of information about the history of the Internet and its branches. In the late 1940s, at the beginning of the Cold War, two professors from Massachusetts Institute of Technology conceived of an electronic surveillance system in order to defend America from Soviet bomb attacks. This idea was adopted in 1953 by the U.S. Air Force and became the first computer network, called the Semi-Automatic Ground Environment (SAGE) (Lambert, Woodford, Poole, & Moschovitis, 2005). In the 1960s, two of the Advanced Research Projects Agency Network's (ARPANET) founding fathers, J.C.R. Licklider and Robert Taylor, came up with the idea of a long distance computer network and shared a vision of how computer networks would link people together (Lambert et al., 2005). The ARPANET, intended to link research centers across the country, provided the foundation for advanced networking and broke ground for the Internet. In late 1969, ARPANET's preliminary trial between Los Angeles and Stanford was a success (Lambert et al., 2005).

In the 1970s, approximately 100,000 computers were used in America, mostly in government and university settings. However, only a few of those computers had network connections (Schell, 2007). In the 1980s, personal computers (PC) finally became affordable. It is interesting to note that in 1981, fewer than 300 computers were connected to the Internet (Schell, 2007).

Until 1991, the Internet was restricted in the United States to linking the military and select university computers. In 1991, Internet use became accessible for businesses after the Internet use ban was lifted (Schell, 2007). As of 2013, 74.4% of households in the US reported accessing the Internet, compared to only 18% of American households in 1997 (United States Census Bureau, 2014). Although only 49.6% of the world's population were using the Internet (Internet World Statistics, 2017), as of June 2016, 88.6% of the US population had access to the Internet (Internet World Statistics, 2016). Historical data shows that the use of technology and the Internet have become an indispensable part of our society and daily lives (Matek, 2014). In addition to the increase in using newer media and technology, users' experiences also changed from being passive consumers to active users. For instance, currently the Internet offers an opportunity to access many things virtually, including old media where users are inactive consumers, such as music and TV shows, as well as newer interactive forms of media, such as chats, social networking sites, blogs, and forums (Brown & Bobkowski, 2011).

Internet use. Owing to the evolution of personal computers, electronic devices, and Internet access (cable and wireless), technology has affected humans in their personal and work lives. Therefore, since the millennium, a considerable number of researchers have paid attention to the role and effects of Internet and social media use. For example, people are learning and gaining information through the Internet while spending a large amount of time on the Internet (Brown & Bobkowski, 2011). Depending on the purpose and pattern of use, the Internet can lead to negative outcomes, such as aggressive behavior, depression, eating disorders, and misleading ideas about romantic and sexual relationships (Bell, 2007; Brown & Bobkowski, 2011; Clifton, Goodall, Ban, & Birks, 2013). Moreover, controlled Internet use could be more challenging for those who are already at high risk for depression or anxiety (Ybarra et al., 2005). As the technology evolves, symptoms resulting from use of technology, Internet, and smartphones, as well as texting might continue to change due to the pervasiveness of newer forms of technology and the ubiquitous nature of wireless Internet.

The Internet contributes to our lives in many ways, such as being a communication tool, information resource, and health-seeking instrument due to its fast, anonymous, and low cost features, but caution needs to be exercised because of its detrimental effects (Clifton et al., 2013). College campuses are one of the places where

unlimited Internet access is available. Thereby, college students have great potential to experience negative effects of the Internet because they might use it excessively and stay on the Internet longer than intended (Chen, 2012). Internet use has its advantages and disadvantages depending on the pattern of usage, such as enriching communication and helping to develop social networking. On the other hand, misuse might increase anxiety, loneliness, and lower school performance (Clifton et al., 2013).

Researchers have focused on the positive effects of Internet use. For instance, according to Chen's (2012) study, some positive effects of Internet use were reported in terms of social relationships. For example, many people spend time online in order to meet their social needs, such as having conversations and receiving support (Chen, 2012; Sproull & Faraj, 1995, p. 65). These features of Internet use help people feel more comfortable while communicating, meeting their needs, and being anonymous (Caplan & Turner, 2007; Chen, 2012) because anonymity might allow hesitant people to be more open and direct on the Internet (Caplan & Turner, 2007, p. 989). Although Internet use provides some benefits, some study results showed that excessive use of the Internet might cause negative effects, such as increasing the potential for loneliness, depression, and other mental health issues (Ceyhan & Ceyhan, 2008; Chen, 2012). For example, according to Whang et al. (2003), students with Internet dependency reported greater levels of depression, loneliness, and compulsivity compared to non-dependent students (p. 148).

Although these technologies have some disadvantages and harmful effects depending on their use, they are also attractive and college students seem to have a

tendency to use them as a way to communicate with others online and feel accepted in a virtual environment while remaining partially anonymous (Milani et al., 2009). However, what may begin as a type of benign free time activity might become a more problematic way of use when it shows symptoms and features similar to already recognized addiction types (Milani et al., 2009). Moreover, problematic Internet use seems to be causing dependency for a small sample of users; however, characteristics of some online tools (e.g., reward or competition) might be affecting users more than other tools (Brown & Bobkowski, 2011). Young was the first scholar to define problematic Internet use as "Internet addiction" in clinical terms (Milani et al., 2009, p. 681). Although many scholars have actively promoted their research findings for Internet addiction to be included in the DSM-5, there is still no formal diagnosis for Internet addiction in the field (APA, 2013).

Since the beginning of public use of the Internet, people use it for numerous purposes, such as networking, communication, information searching, research, and online shopping (Morgan & Cotten, 2003, p. 136), news, entertainment, and blogging (Chathoth, Kodavanji, Arunkumar, & Pai, 2013), email and social networking (Cotten, Anderson, & McCullough, 2013). However, different uses create various outcomes. Therefore, it is important to focus on evaluating not only how much time is spent online, but also how the Internet is used, such as doing online research for educational purposes instead of using social networking to procrastinate (Romer et al., 2013). Researchers stated that moderate information users among college students, who tend toward reading books online and using the Internet in order to gather information instead of watching TV in general, are more active in social and academic clubs and generally advantaged through other effects (Romer et al., 2013; Shaw & Gant, 2002). Heavy information users, who mostly read books online and use the Internet primarily for information gathering, have higher grades, participate in social and academic clubs more often, and have moderately low rates of depression (Romer et al., 2013, p. 617).

As of 2017, 49.6% of the world's population uses the Internet (Internet World Statistics, 2017). In the United States, 88.6% of the population use the Internet (Internet World Statistics, 2016), and 94% of young adults, ages 18-29, use the Internet (Pew Research Center, 2014a). Over the past decade, the Internet user population has grown rapidly and various age groups are staying online longer than before. However, young adults are most likely to use the Internet more than any other age groups (Pew Research Center, 2014b). The use of portable personal devices affects this increase because for people under the age of thirty, laptops are used more commonly than desktops, and the use of wireless Internet use rate among young adults is higher than other age groups (Pew Research Center, 2010). For instance, according to the Pew Research Center report, "81% of adults between ages of 18 and 29 are wireless Internet users", while "63% of 30-49 year olds and 34% of those ages 50 and over access the Internet wirelessly" (Pew Research Center, 2010, p. 4).

While the Internet can offer many advantages with regards to receiving education, information, and assistance, issues associated with excessive Internet use sometimes are conceptualized as an addictive form of usage.

Addiction

In order to identify and treat them similarly or differently, addictions and addictive behaviors are labeled in different categories, such as substance addictions and behavioral addictions. The pleasure principle or feeling is similar in both substance and behavioral addictions, but physical signs of substance addiction are not present in behavioral addictions (Alavi et. al, 2012). Therefore, defining addiction is not easy due to its abstract concept that does not always involve a substance or intoxicant. For example, some excessive dysfunctional behaviors are defined as addictions, such as gambling, gaming, binge eating, excessive exercising, sex addiction, and pathological working (Alavi et al., 2012, p. 291).

According to Young and Rodgers (1998), behavioral addictions have the same symptoms and consequences as substance disorders, such as withdrawal, craving, social isolation, and depression. Behavioral additions, such as gaming, gambling, Internet browsing, and excessive shopping, stimulate the brain systems the way substances do (Potenza et al., 2003) which promotes a biochemical reward effect similar to substancerelated addictions (Alavi, 2012; Potenza et al., 2003). Therefore, even if behavioral addictions do not involve substance use, symptoms and consequences of substancerelated addictions and behavioral addictions show similarities.

Problematic Internet Use

Because the DSM-5 has no official diagnosis for problematic Internet use or Internet addiction, researchers use different terms. Many terms in the literature refer to problematic Internet use or Internet addiction, such as Internet addiction (Young, 1998b),
pathological Internet use (Young, 1998b; Davis, 2001), and problematic Internet use (Caplan, 2002). Bell (2007) stated that two main elements pervade the literature regarding problematic Internet use. The first is "compulsive Internet use or Internet addiction," and the second is "psycho-pathological effects (typically depression or isolation)" in regards to online usage time (p. 448). Therefore, the proposed diagnostic criteria for "Internet addiction" or "pathological Internet use" only refers to "using the Internet" or "spending time online" without referring to any particular characteristics of an online activity (Bell, 2007, p. 448; Young, 1998b, p. 239). Although there is no official diagnosis for Internet addiction, instruments exist which can identify Internet addiction and problematic Internet use. However, the DSM-5 only suggests these issues need to be taken into consideration, but does not identify these issues as a diagnostic anomaly (APA, 2013).

Negative consequences of problematic Internet use. Problematic Internet use has raised some levels of concern about its possible negative effects on young users due to the easy accessibility of unlimited contents related to various topics. However, the Internet and social media tools might be helpful for personal and social development of the people depending on the purpose of their use (Brown & Bobkowski, 2011, p. 96). For some people, it might be tempting to have an opportunity to communicate online anonymously without being aware of its potentially negative impacts. For example, studies showed that young adults who feel lonesome or anxious in social settings or present depressive symptoms might go online to communicate with strangers with whom they have no relationship outside of the online world (Gross et al., 2002, p. 84; Ybarra et al., 2005, p. 10; see also Brown & Bobkowski, 2011). Therefore, even before becoming involved in real-life situations, young adults might develop unrealistic cultural models, expectations, perceptions, and scripts about romantic and social relationships due to media exposure in their daily lives (Brown & Bobkowski, 2011; Milbrath, Ohlson, & Eyre, 2009).

A considerable amount of research has been conducted regarding the relationship between problematic Internet use and mental health. Although technology brings opportunities and makes our lives easier, potential negative effects may come to light depending on the use of technology and Internet. Researchers van den Eijnden, Meerkerk, Vermulst, Spijkerman, and Engels (2008) found that use of instant messaging was associated with compulsive Internet use, depression, and loneliness (p. 661). Moreover, other researchers reported that the users' online activities that have been identified to show a level of problematic Internet use usually suggest that gaming, chat, and erotica are the most notable (Bell, 2007, p. 448; Chak & Leung, 2004, p. 568; Chou & Hsiao, 2000, p. 78). Additional studies have detailed the relationships between types of online usage and mental health. According to Amichai-Hamburger and Ben-Artzi (2003), social network usage and loneliness are positively correlated. Results of this study also indicated that females experience loneliness more than males. Another researcher reported that male chat users are typically less happy than female chat users (Kang, 2007). Chen (2012) reported that students with high problematic Internet use were more likely to have low psychological well-being (p. 2224). Chen's study also confirmed another study's result where people with problematic Internet use exhibited a strong

direct effect on depression, loneliness, and low self-esteem (van der Aa et al., 2009). Findings from Greenfield (2011) indicated that problematic Internet use could affect relationships negatively. For example, it was reported that approximately 50% of divorces in France had some level of abusive Internet use issue (Greenfield, 2011). These results demonstrate that problematic Internet use has various negative effects in people's lives, whether or not the users are single or married, male or female, student or worker.

The Internet Addiction Test (IAT)

In the literature, the term "Internet addiction" was used for the first time by Young (1998b). Young first defined Internet addiction as "an impulse control disorder that does not involve an intoxicant" (p. 238) and she used the term "Internet addiction" in her study of the topic. Young's purpose was "to determine a set of criteria that would define addictive Internet usage from normal Internet usage" which led to the development of an eight-item Diagnostic Questionnaire (DQ) (p. 237). Young modified pathological gambling criteria in the Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition (DSM-IV) (American Psychiatric Association [APA], 1994) to provide a screening instrument for her dependent Internet users study (Young, 1998b). The DSM-IV outlined 10 criteria for Pathological Gambling, however, two items were not related to Internet usage and were removed from the adaptation (APA, 1994; Young, 1998b).

After finalizing the Diagnostic Questionnaire (DQ), Young (1998b) recruited 605 volunteer participants via newspaper advertisements, flyers on college campuses, and postings on electronic support groups for Internet addiction. Demographic information and length of time using the Internet were also collected. Of the 605 participants, 496

were used as valid responses for the study sample. The sample of dependent users was 396 people (157 males and 239 females) while the sample of non-dependents was 100 people (64 males and 36 females) (Young, 1998b, p. 239).

Study results suggested that there were differences among the specific Internet applications used between these two groups, such as usage of chat rooms (35% dependent and 7% non-dependent), Multi User Dungeons (MUD) (28% dependent and 5% nondependent), newsgroups (15% dependent and 10% non-dependent), e-mail (13% dependent and 30% non-dependent), www pages (7% dependent and 25% nondependent), and information protocols (2% dependent and 24% non-dependent) (Young, 1998b, p. 240). In addition, dependent users reported that "excessive use of the Internet caused personal, family, and occupational issues" (Young, 1998b, p. 241). Nondependent users reported "time distortion was the major result of the Internet use" but that "real-life responsibilities were not neglected" (Young, 1998b, p. 241).

Young's Diagnostic Questionnaire was revised into a 20-item instrument called the Internet Addiction Test (IAT) (Young, 1998b). Young later introduced the instrument in her book *Caught in the Net* (Young, 1998a). The IAT employs a six-point Likert scale (from "does not apply" to "always") with scores ranging from 20 to 100. IAT guidelines recommend that scoring less than 30 is categorized as average Internet use, scoring from 31 to 49 is categorized as mild problematic Internet use, 50 to 79 is categorized as moderate problematic Internet use, and scoring 80 to 100 is categorized as severe problematic Internet use (Young, n.d., p. 5). When Young introduced the IAT, the major discussion of the instrument was its lack of validity and reliability. The IAT has high face validity, but Young did not report any statistical results of the instrument in her book *Caught in the Net* (Young, 1998a). Young also did not go further in conducting a validation study of the instrument. However, other researchers filled the gap by conducting validation studies of Young's IAT in different countries.

The validation of the IAT in United Kingdom. Widyanto and McMurran (2004) conducted the first validation study of Young's IAT. They conducted their study online, posting to sources such as (a) chat programs, (b) psychology newsgroups, (c) Internet related newsgroups, (d) www.ebay.com, (e) Multi User Dungeons (MUD), (f) individuals who searched "Internet Addiction" on search engines, and via (g) posters advertising the site in a Cyber Café. As a result, ninety-two participants were recruited and 86 valid responses (29 males and 57 females) were used in the study (Widyanto & McMurran, 2004, p. 445).

Correlations between the six factors (salience, excessive use, neglecting work, anticipation, lack of control, and neglecting social life) obtained from the 20-item IAT, and age, duration of Internet use, average use, personal use, and professional use were examined. Salience was found to be positively correlated with average Internet use, r = .26 and p < .05, and personal Internet use, r = .32 and p < .01. The six IAT factors were significantly correlated with each other, ranging from r = .22 to r = .62; the IAT factors showed good to moderate internal consistency, the Cronbach's alpha levels ranged from $\alpha = .54$ to $\alpha = .82$. The strongest correlation was between salience and excessive use, r = .62 while the weakest correlation was between neglecting work and neglecting social life, r = .22 (Widyanto & McMurran, 2004, p. 446).

Although, the IAT validation had statistically significant results, one of the major limitations of this study was the sampling of the participants. Participants who volunteered to be part of the study were self-selected, which means that a random sampling procedure from the population was not employed. This study used convenient and self-selected Internet users, which resulted in methodological biases of the study. The small sample size also raises concerns and can make interpretation difficult (Widyanto & McMurran, 2004, p. 449).

The validation of the IAT in China. Chang and Law (2008) translated the IAT into Chinese and assessed it using a confirmatory approach in order to evaluate the psychometric properties and factor structure. They distributed 480 paper-based questionnaires, and 410 usable questionnaires (187 males and 223 females) were returned from undergraduate students from eight Hong Kong universities. The percentage of participants from each university ranged from 11.5% to 15.1%. Chang and Law also asked for information about participants' gender, age, academic performance, educational background, Internet experience, weekly Internet usage, and the type of activity in which they were engaged (p. 2602).

The original data were randomly divided into two subsamples, one (n = 205) for "exploratory factor analysis," and the other (n = 205) for "confirmatory factory analysis" (Chang & Law, 2008, p. 2602). Their findings resulted in a three factor structure: "withdrawal and social problems," "time management and performance," and "reality substitute" for the IAT (Chang & Law, 2008, p. 2606). These three IAT factors had high and significant positive correlations with each other, ranging from r = .83 to r = .88 (Chang & Law, 2008, p. 2605).

The validation of the IAT in Italy. The IAT was translated to Italian and was administered online to an Italian sample by Ferraro, Caci, D'amico, and Di Blasi (2007). The Italian sample size was 236 (139 males and 97 females). The researchers collected data online in frequently used private chat rooms of Italian Internet Relay Chat which resulted in participants made up of students (55.1%) and employees (44.9%) (Ferraro et al., 2007, p. 171).

The study results did not show statistically significant differences in the total scores of IAT between genders (males and females) which was p = .12, and between students and employees which was p = .12. However, the researchers did not provide results of the factor analysis (Ferraro et al., 2007).

The validation of the IAT in the USA. The US validation study of the IAT was conducted by Jelenchick, Becker, and Moreno (2012). Jelenchick et al. (2012) collected their data from undergraduate students between ages 18 and 20, at two public universities in the US. They used a Facebook search engine in order to identify students' profiles. After excluding those who did not meet the researchers' criteria, 307 students were asked to participate in the study by sending an email to each eligible student's "edu" email address that contained further information about the study and a link to the study survey (Jelenchick et al., 2012).

Of the 307 eligible students, 224 participants responded to the survey. The researchers excluded incomplete surveys and included 215 complete surveys (99 males

and 116 females) for their analysis. Participants' average age was 18.8 years old. The researchers received approximately half of their data from one university and the other half from the other university (Jelenchick et al., 2012).

For the exploratory factor analysis, the researchers generated two interpretable factors, "dependent use" and "excessive use," for the IAT. The Cronbach's alpha reliability coefficients were $\alpha = .91$ and $\alpha = .83$, respectively for the factors. Also, the researchers found a moderate linear correlation between the two factors, r = .57. Factor one, which grouped 12 questions for dependent use, accounted for 73% of the variance compared to factor two, which used the remaining eight questions for excessive use that accounted for only 17% of the variance (Jelenchick et al., 2012, p. 298).

A review of the problematic Internet use literature shows that Internet use has several levels and excessive use is generally called Internet addiction. The most wellknown assessment instrument of problematic Internet use is the Internet Addiction Test, developed by Young (1998b). However, problematic Internet use is not the only form of dysfunctional online behavior addressed in this study. Online gaming and online gambling are other forms of activities that occur on the Internet. The following sections cover online gaming and online gambling activities as the focus of this study.

Online Gaming

Online gaming is an application that connects players through the Internet network (Adams, 2014). The first online role-playing game (RPG), multi-user dungeons or domains (MUD), was developed between 1978 and 1980 at the University of Essex (Crawford et al., 2011; Fox, 2006). It was a text-based adventure game where players were presented with written descriptions. In 1985, the first online graphical game, called *Habitat*, was developed by Lucasfilm Games. The relationship between online video games and the Internet is now vividly illustrated by massively multi-player online role-playing games (MMORPG) (Crawford et al., 2011).

As of 2013, the video game industry had a \$93-billion value in the worldwide market (Gartner, 2013). Researchers stated that people play online games not only to cooperate and compete with each other, but also to have an opportunity to socialize with other people in a virtual environment (Fuster, Andres, Carbonell, & Vallerand, 2014; Park & Lee, 2012). It is important to point out that online gaming is not limited to PCs in today's technological world where the Internet is accessible on many personal devices, such as consoles, laptops, and smartphones (Crawford et al., 2011).

Moreover, through mobile Internet access on smartphones, accessing online games is becoming easier for all age groups. As a result of easy access to games, the rate of female game players (age of 50 and older) has increased by 32% from 2012 to 2013 (Entertainment Software Association, 2014, p. 3). As of 2015, female gamers comprise a large part of the whole gamers population at 44%. The mean age of gamers also has been reported as 35 years old (Entertainment Software Association, 2015, p. 3). However, gender is a determinant factor on how a person is treated in online interactions. Researchers have stated that having a female persona in a cyber world has a great deal of positive social attributes in a male-dominated environment (Hussain & Griffiths, 2008; Linderoth & Ohrn, 2014), such as receiving compliments, courtship behavior, and being treated differently from male players in a virtual environment. These behaviors could be linked to social learning through our interactions with others, observations, TV, social media, or other media forms.

Brehm (2013) relates Bandura's social learning theory (1965) to how media representations influence gender roles in cultures and proposes the same effects might be seen in online video games. Other researchers also showed a strong correlation between media consumption and desired or acceptable behavior of genders (Beasley & Standley, 2002). In addition to these courtship or dominated behaviors shown by male gamers, interactions between males and females sometimes might be more serious.

Owing to gender stereotyping and hyper-masculinity in online video games, based on social learning theory and preexisting literature, Brehm (2013) pointed out that "some players in online video games, such as MMOs, are perpetrators of cyberbullying/sexism/harassment not because of the gaming environment itself but because of preexisting personality traits and beliefs which are often influenced by societal norms (masculinity, power, male dominance, etc.)" (p. 2). Eklund (2011) and Brehm also reported that male gamers often help female gamers, whether females wanted or not, in order to maintain control over the game.

The present study identifies online gaming behavior using the Problematic Online Gaming Questionnaire (POGQ) (Demetrovics et al., 2012) as one of the instruments for data collection. In order to determine differences between online gaming behavior of males and females, the present study ran additional exploratory analysis of online gaming behavior between genders.

The Problematic Online Gaming Questionnaire (POGQ)

According to researchers, gamers typically spend more time with online gaming than they planned (Demetrovics et al., 2012; Ng & Wiemer-Hastings, 2005; Smyth, 2007). Gamers also ignore their other important daily activities, which results in negative effects on their lives (Demetrovics et al., 2012). The current gaming instruments target mostly the users of MMORPG, but the gamer population is more diverse because of the variety of online and offline games. Therefore, a proper instrument was needed in order to assess other online gaming behaviors, other than MMORPG (Demetrovics et al., 2012, p. 1). For these reasons, Demetrovics et al. (2012) developed eighteen items the Problematic Online Gaming Questionnaire (POGQ) to explore and identify the dimensions of problematic online gaming behavior.

In order to reach a gamer population, the researchers identified 18 websites in Hungary where online games were played. The researchers contacted all 18 websites in order to gain information about the number of visitors of those websites. Based on the information the websites provided, 30,000 registered online gaming users were identified. However, many users registered on multiple websites; therefore, it was hard to estimate the approximate number of users (Demetrovics et al., 2012).

The researchers asked websites to post a call for participation in their study. The gamers were requested to visit a website created by the researchers, to sign in with a password which was provided to them by the researchers, and to complete an online questionnaire. The researchers received 4390 participants, but not every participant's survey was valid due to incomplete parts; therefore, 3415 usable questionnaires were

identified. Ninety percent of the sample was male (n = 3072) and 10% was female (n = 343). The majority of the participants were students (61.9%) (Demetrovics et al., 2012, p. 2).

The researchers identified six factors that instrument items were assessing: (a) preoccupation (obsessively dreaming about gaming), (b) immersion (excessive engagement with games), (c) withdrawal (symptoms of withdrawal players experience when away from gaming), (d) overuse (excessive gaming and time spent online), (e) interpersonal conflict (reactions of the gamers' social environment), and (f) social isolation (what gamers prefer over social life) (Demetrovics et al., 2012, p. 5). In order to assess the factor structure of the items, an exploratory factor analysis was performed on two samples, Sample 1 (n = 600) and Sample 2 (n = 600). Their results were satisfactory for both samples, p < .0001. Based on the previous two analyses, another factor was examined for Sample 3 (n = 600) using a confirmatory factor analysis. This analysis also showed a satisfactory result, p < .0001 (Demetrovics et al., 2012, p. 3).

The POGQ was created in order to provide an applicable instrument for assessing problematic gaming behavior of all types of online games. One limitation of the study was the population because it was comprised of Hungarian gamers. Therefore, generalization of the results for other populations in different cultures should be made cautiously. Another issue is that these results were based on non-clinical self-reports that might affect the reliability of the data (Demetrovics et al., 2012, p. 7).

The validation of the POGQ in Hungary. The Hungarian validation study of the POGQ was conducted by Papay et al. (2013). The aim of this study was to test the

psychometric properties of the POGQ. In order to obtain a nationwide sample, the researchers collected data by using the European School Survey Project that collects data on smoking, alcohol, and drug use. The project also allows each country to add additional questions. Therefore, Hungary added the POGQ to assess online gaming behavior among Hungarian adolescents (Papay et al., 2013).

After removing cases where data were missing on the POGQ items, the final sample size was 2,774 out of 5,045 participants. The sample was divided into two groups of gamers and non-gamers. A confirmatory factor analysis was performed on the final sample (n = 2,774). The researchers found that the correlations between factors (preoccupation, immersion, withdrawal, overuse, interpersonal conflict, and social isolation) ranged from r = .57 to r = .82. Based on confirmatory factor analysis, the composite reliability of each dimension was greater than $\alpha = .60$ and the Cronbach's alpha reliability coefficient was $\alpha = .91$ for the total POGQ (Papay et al., 2013, p. 342).

Negative consequences of online gaming. In today's Internet world, online game playing has become popular among young people and as an outcome of its popularity by 2007, a vast majority of young people, ages from 8 to 18, were playing online games, for more than an hour in a day (Brown & Bobkowski, 2011; Henry J. Kaiser Family Foundation, 2010). Unlike television, online games are a different use of media because online video games offer two-way interactions and rewards. Online violent game players, who engage in violent actions in a virtual environment and receive rewards for their actions, typically characterize themselves with the characters they control in the game and aggressively present similar behavioral patterns (Brown & Bobkowski, 2011; Carnagey, Anderson, & Bartholow, 2008). As a result, researchers indicated that both the amount of time spent with violent online games and the level of violence in the games were linked to increased levels of aggressive behaviors (Anderson, Gentile, & Buckley, 2007; Brown & Bobkowski, 2011). Additionally, involvement in violent games was associated with aggressive behavior patterns and hostility (Brown & Bobkowski, 2011).

Aligned with Bandura's (1965) social learning theory, researchers found that aggressive behavior in adulthood, between ages 20 and 22, was predicted by childhood exposure to violent games, television and media content, representing the behaviors of violent characters, and thinking of the violent actions as being realistic between the ages of 6 and 10 (Brown & Bobkowski, 2011; Huesmann, Moise-Titus, Podolski, & Eron, 2003). Hence, aggressive behavior directed from one online user to another might be categorized as "cyber-bullying or online harassment," depending on the severity of the behavior (Brown & Bobkowski, 2011, p. 100). Cyber-bullying has been defined as "creating web-sites or sending email or text messages or posting public messages through online games, intended to embarrass or harass a peer or to threaten physical harm" (David-Ferdon & Herts, 2007, p. 1). Due to easy access to the Internet and the simplicity of creating online content, there is little control over the cyber world. Hence, anyone can create content to harass or embarrass a person and having technological advantages might cause negative outcomes depending on the use.

Furthermore, researchers reported that "victimized students overall were marginally more likely to be aggressive" (Slater, Henry, Swain, & Cardador, 2004, p. 656) and "the relationship between violent media use and aggression was stronger for the adolescents who were alienated from school and for those who were victimized by their peers than for those who did not face such social challenges" (Brown & Bobkowski, 2011, p. 98; see also Slater et al., 2004). Additionally, cyberbullying has negative effects on a victim's life. For example, people who were harassed online have a tendency to skip school, be suspended from school, be assigned to detention, and carry a weapon (Brown & Bobkowski, 2011; Ybarra, Diener-West, & Leaf, 2007).

As previously stated, problematic Internet use is not the only dysfunctional online behavior. Following this review of the online gaming literature, dysfunctional online gaming behaviors, assessment instrument, and negative consequences of online gaming, the following section provides information about online gambling as being another focus of the present study.

Online Gambling

According to the APA (2013), "gambling involves risking something of value in the hopes of obtaining something of greater value" (p. 586). Gambling also is not a new phenomenon and is popular across many cultures. Researchers reported that there were more gamblers than non-gamblers on a national level (Griffiths, 2011; Hornle & Zammit, 2010). Online gambling, similar to online gaming, is a virtual platform where players gamble against computer software or each other through the Internet (Griffiths, 2011). In today's technological world, online gambling is not a theoretical concept, but a new form of business all around the world. Online gambling takes a variety of forms, such as roulette, card games, slot machines, and horseracing. Also, some websites offer simulation games for horse or dog racing. Moreover, another popular form of online gambling is virtual poker tournaments where players are given an avatar and the flexibility to change or shape their avatar in a virtual environment (Hornle & Zammit, 2010).

Several studies showed higher gambling prevalence ratios among online than offline gamblers (Griffiths, Wardle, Orford, Sproston, & Erens, 2009; Mccormack, Shorter, & Griffiths, 2013; Wood & Williams, 2011). A study among the British population reported that 7.3% of adults experience some maladaptive gambling behaviors (National Centre for Social Research, 2011). However, online gambling behaviors have no diagnostic criteria in the DSM-5. Therefore, for the purpose of this study, offline gambling disorder criteria based on the DSM-5 might be used in order to identify dysfunctional online gambling behaviors.

The Gambling Symptom Assessment Scale (G-SAS)

The Gambling Symptom Assessment Scale developed by Kim et al. (2009) is a twelve-item self-rating scale that measures gambling symptom severity. According to Kim et al., the G-SAS combined the scale concepts from two prior instruments: the Leyton Obsessional Inventory (LOI; Cooper, 1970) and the Yale-Brown Obsessive Compulsive Scale (YBOCS; Goodman et al., 1989a; Goodman et al., 1989b) (p. 77). The items ask for gambling behavior symptoms based on the past seven days of gambling activity. Items 1-4 ask for the average use, 5-7 ask for the average frequency, item eight asks for the time spent on gambling or gambling related behavior, item nine asks for excitement caused by the gambling act, item 10 asks for excitement or pleasure associated with winning, item 11 asks for emotional distress, and item 12 asks for

personal trouble (Kim et al., 2009). Scores on each item of the G-SAS range from 0 to 4, with a total maximum score of 48. The total score range for gambling behavior measured by the G-SAS is as follows: 8 - 20 = mild, 21 - 30 = moderate, 31 - 40 = severe, and 41 - 48 = extreme gambling behavior symptoms (Kim et al., 2009, p. 77).

Studies have been conducted to assess the psychometric properties of the G-SAS and earlier versions of the instrument. Kim, Grant, Adson, and Shin (2001) reported a Cronbach's alpha reliability coefficient of α = .89 on a previous version of the G-SAS, while Kim et al. (2009) reported a Cronbach's alpha reliability coefficient of α = .86 for the current version of the G-SAS. In order to assess convergent validity, the G-SAS was compared with the Pathological Gambling Clinical Global Impression (PG-CGI), resulting in moderate to strong convergent validity ranging from .67 to .82 during the three-week study period (Kim et al., 2001, p. 917). In another validity study with 207 participants, Spearman correlation coefficients between the total scores of the YBOCS and the G-SAS were reported as *rho* = .51 (Kim et al., 2009, p. 79). Test-retest correlation for the current version of the G-SAS was .56 (Kim et al., 2009, p. 79).

Negative consequences of online gambling. Dysfunctional behaviors, such as problematic gambling, can have addictive features without any use of substances or chemicals. These behaviors might affect certain brain mechanisms and provide reward similar to chemical or substance use (Potenza et al., 2003, p. 832; see also Lee 2009, p. 8). Although this expanded concept of addiction is overlapping with impulse control disorders, it certainly provides a fresh perspective in defining problematic Internet use as a behavioral addiction (Lee, 2009). The activity of online gambling presents potential

risks for gamers and for society in the long term (Hornle & Zammit, 2010) because the online gamblers can be expected to present additional issues, such as mental health and substance use (Petry & Gonzalez-Ibanez, 2015). Additionally, online gambling behavior might lead to legal problems due to online gambling prohibitions at the state or federal levels.

The most important concern is not gambling, but problematic gambling behavior or gambling addiction. For this particular reason, regulations prohibit gambling on credit in England because for many gamblers, gambling can lead to financial, social, and family problems (Hornle & Zammit, 2010). In addition to this, gambling may eventually lead to criminal acts. In the US, regulations are complex at the federal and state levels. Many states have different rules and approaches to gambling. For instance, Missouri and Utah prohibit all sorts of land-based gambling, but Missouri allows floating casinos (Hornle & Zammit, 2010; Missouri General Assembly, 2014; Utah State Legislature, 2012). Federal law prohibits online gambling, but exceptions are controversial. For instance, the federal law does not give clear information on how interstate horse or dog racing or gambling is prohibited on a different land, such as Europe or India (Hornle & Zammit, 2010). However, The Wire Act provides information and consequences about online gambling. The law states that:

Whoever being engaged in the business of betting or wagering knowingly uses a wire communication facility for the transmission in interstate or foreign commerce of bets or wagers or information assisting in the placing of bets or wagers on any sporting event or contest, or for the transmission of a wire communication which entitles the recipient to receive money or credit as a result of bets or wagers, or for information assisting in the placing of bets or wagers, shall be fined under this title or imprisoned not more than two years, or both. (United States Code, 2011, p. 312).

In the previous sections, it was established that dysfunctional online behaviors might have negative effects, not only physically but also mentally, such as depression, anxiety, and low quality of life. In the following section, potential negative effects of problematic online behaviors on mental health are reviewed.

Mental Health

Dysfunctional behaviors may contribute mental health issues, whether the behavior occurs in an online or offline environment. Researchers have reported that problematic Internet use and experiencing mental health issues are related and positively correlated (Brown & Bobkowski, 2011; Ceyhan & Ceyhan, 2008; Chen, 2012). However, it is difficult to determine a causal relationship, whether problematic Internet use causes mental health problems or mental health problems cause problematic Internet use (Caplan, 2002: Ceyhan & Ceyhan, 2008; Morahan-Martin, 1999).

Some researchers recognized behavioral and individual characteristics escalate the probability of young adults experiencing challenges or issues on the Internet (Brown & Bobkowski, 2011). For example, youths with depressive symptoms are more likely to engage in risky behaviors than other people on the Internet, such as disclosing personal information or talking to strangers in an online environment with whom they do not have any physical contact (Brown & Bobkowski, 2011; Ybarra et al., 2005).

Furthermore, the detrimental use of the Internet may not only cause mental health issues, but might also lead to physical issues. For example, examining the relationship between mental health and physical health, body image is an area where media (including social media on the Internet) promotes views that "thin is normative and attractive," while "overweight is aberrant and repulsive" (Brown & Bobkowski, 2011, p. 103; Harrison & Hefner, 2008, p. 387; Levine & Harrison, 2009, p. 494). Therefore, popular examples of unrealistic female and male bodies might cause physical and mental health issues among people, ranging from pre-occupation with thinness, to extreme exercising and dieting, to serious eating disorders (Brown & Bobkowski, 2011, p. 102).

Although more than half of the U.S. population is overweight (Greenberg, Eastin, Hofschire, Lachlan, & Brownell, 2003; see also Brown & Bobkowski, 2011), study results showed that females with body image issues and eating disorders look for culturally ideal thin figures on the internet (Brown & Bobkowski, 2011; Thomsen, McCoy, Gustafson, & Williams, 2002), and young females are more likely to adopt the ideal thin models that may cause disordered eating over time (Brown & Bobkowski, 2011; Harrison & Hefner, 2008). Researchers also stated that, specifically for young females, positive descriptions of slim models and undesirable characteristics of overweight or heavier figures on the Internet and social media reduce females' gratification with their own bodies and may cause symptoms of eating disorders for both genders, but mainly for young females (Brown & Bobkowski, 2011; Harrison & Hefner, 2008). Harrison and Hefner (2008) also stated that the media's problematic chief role is helping to create a social environment over the internet that (a) normalizes dieting and excessive thinness, and (b) encourages young adults to repeatedly evaluate their bodies to find them wanting, and to engage in extreme-dieting, over-exercising, and other health-compromising behavior in an effort to relieve perceptions of inadequacy (p. 382).

Study results showed that dysfunctional online behaviors have various negative effects on mental health as well as physical and physiological effects, and potential legal problems. Regarding the matters of the present study, the following section describes mental health disorders associated with dysfunctional online behaviors.

Gambling disorder. According to the DSM-5 (APA, 2013), a gambling disorder is defined as "a cluster of four or more of the symptoms listed in Criterion A occurring at any time in the same 12 months period" (p. 586). The base period of gambling disorder might take place during the years of adolescence or young adulthood. However, some people might experience it during middle or even older adulthood (APA, 2013). Owing to the role of technology in the development of gambling practices, issues with offline gambling might transfer to online gambling because the Internet not only provides an alternative gambling experience, but also offers anonymity that may affect the players' online behavior (Griffiths, 2011). Therefore, in addition to gambling disorder symptoms in DSM-5, online gambling disorder could be another form of problematic gambling behavior.

Internet gaming disorder. The DSM-5 (APA, 2013) defined Internet gaming disorder as "a pattern of excessive and prolonged Internet gaming that results in a cluster

of cognitive and behavioral symptoms, including progressive loss of control over gaming, tolerance, and withdrawal symptoms, analogous to the symptoms of substance use disorders" (p. 796). Similar to substance-use disorders, people with Internet gaming disorder experience similar symptoms, such as continuing to engage in maladaptive behavior and neglecting other activities (APA, 2013). However, Internet gaming disorder is only proposed in DSM-5, but is not considered a mental health disorder by American Psychiatric Association.

Depression. Depression is described as feeling sad, hopeless, or miserable (APA, 2013). DSM-5 differentiates depressive disorders by conditions with the common features of all depressive disorders identified as sadness, emptiness, hopelessness, or irritable moods (APA, 2013, p. 160). In the literature, depression is linked to several conditions, such as prolonged and problematic Internet use, Internet related dysfunctional activities (Ceyhan & Ceyhan, 2008; Chen, 2012; Romer et al., 2013), and media multitasking (using more than two forms of media at the same time) as it might affect cognition to filter inessential information (Becker, Alzahabi, & Hopwood, 2013).

Beck Depression Inventory - II and its validation. The purpose of using the Beck Depression Inventory - II (BDI-II) in this study is only to determine participants' level of depression, not to diagnose them. The BDI was first published in 1961 (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and contains 21 multiple-choice questions. Each question has four possible statements to select from. All answers are rated from 0 to 3, with three being the most severe degree of depressive symptoms, and the total scores can range from 0 to 63, with higher scores indicating greater levels of depression. The symptoms are

(a) mood, (b) pessimism, (c) sense of failure, (d) lack of satisfaction, (e) guilt feelings, (f) sense of punishment, (g) self-dislike, (h) self-accusation, (i) suicidal wishes, (j) crying, (k) irritability, (l) social withdrawal, (m) indecisiveness, (n) distortion of body image, (o) work inhibition, (p) sleep disturbance, (q) fatigability, (r) loss of appetite, (s) weight loss, (t) somatic preoccupation, and (u) loss of libido (Beck, Steer, & Garbin, 1988, p. 79).

Like the original BDI, the "BDI–II consists of 21 items to assess the intensity of depression in clinical and normal patients. Each item in the BDI-II has a list of four statements arranged in increasing severity about a particular symptom of depression" (Pearson Clinical, n.d., para. 2).

Item-option characteristic curves were compared after testing the original and new items on a large clinical sample (N = 500) and the test developers found the BDI-II (new edition) showed better clinical sensitivity. Test developers also found that the Cronbach's alpha reliability coefficient as $\alpha = .92$ was higher than the BDI's Cronbach's alpha reliability coefficient which was $\alpha = .86$ (Beck, Steer, Ball, & Ranieri, 1996; Pearson Clinical, n.d., para 5).

The BDI-II can be administered by trained interviewers or self-administered. The inventory takes approximately 5-to-10 minutes to complete. The BDI-II total score is calculated by summing the ratings (from 0 to 3) for each item (Beck et al., 1988, p. 79). Based on the BDI-II scoring, total scores ranging from 0 to 13 represent "minimal

depression;" from 14 to 19 represent "mild depression;" from 20 to 28 represent "moderate depression;" and from 29 to 63 are indicative of "severe depression" (Beck, Steer, Ball, et al., 1996, p. 590).

Quality of life. Quality of life is simply defined by many researchers as psychological, physical, economical, emotional, and social well-being (Afsar, 2013; Burckhardt & Anderson, 2003; Felce & Perry, 1995). The generally accepted definition of quality of life by the World Health Organization is "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" (The WHOQOL Group, 1998, p. 551).

World Health Organization Quality of Life - BREF (WHOQOL-BREF). The World Health Organization Quality of Life (WHOQOL) instrument was developed by fifteen international centers of the WHOQOL Group, "in an attempt to develop a quality of life assessment that would be applicable cross-culturally" (The WHOQOL Group, 1998, p. 552). The quality of life project was initiated by the WHOQOL Group in 1991

(World Health Organization [WHO], n.d.) with the goal of developing an instrument to present an "international cross-culturally comparable quality of life assessment instrument" (WHO, n.d., para. 1). The WHOQOL instrument assesses a person's perceptions of "culture and value systems, standards, personal goals, and concerns" (WHO, n.d., para. 1). The instrument was tested in the field internationally where it was developed in fifteen WHO centers (WHO, n.d.). The WHOQOL-BREF contains "26 items that measure the following broad domains: physical health, psychological health, social relationships, and environment" (WHO, n.d., para. 2). The WHOQOL-BREF is shorter than the original instrument (WHOQOL-100) that makes the WHOQOL-BREF more suitable for clinical studies or large research studies (WHO, n.d.; The WHOQOL Group, 1998). Study results revealed that WHOQOL-100 and WHOQOL-BREF domain scores were similar. There were high correlations between WHOQOL-100 and WHOQOL-BREF, ranging from r = .89 to r =.95. For internal consistency, the Cronbach's alpha reliability coefficients ranged from α = .66 to α = .84 for the domains (The WHOQOL Group, 1998, p. 554).

The validation of WHOQOL-BREF in New Zealand. In the New Zealand sample, Krageloh et al. (2013) found the Cronbach's alpha reliability coefficient for the total score was $\alpha = .91$ with subscale reliability coefficients ranging from $\alpha = .71$ to $\alpha = .82$ that were .71 for the social relationship domain, .80 for the physical health domain, .81 for the environment domain, and .82 for the psychological health domain. Further, criteria related validity were assessed by the correlation item and domain scores with item 1 (global quality of life) and item 2 (global health). Items 1 and 2 were significantly correlated with all 24 remaining items, p < .01 (Krageloh et al., 2013).

The validation of WHOQOL-BREF in Brazil. Berlim, Pavanello, Caldieraro, and Fleck (2005) conducted a study to evaluate the psychometric properties of the Brazilian version of the WHOQOL-BREF. Participants were 89 adult outpatients with depression in a university hospital in Brazil. The vast majority of participants were women (average age = 48.93). The Cronbach's alpha reliability coefficient was α = .84. The coefficients

for each of its domains were physical health .81, psychological health .85, social relationship .76, and environmental .79 (Berlim et al., 2005).

In another Brazilian sample, Castro, Driusso, and Oishi (2014) compared the reliability and convergent validity of two instruments, WHOQOL-BREF and Survey Health Status (SF-36), assessing quality of life in a Brazilian sample. They found the Cronbach's alpha reliability coefficients were $\alpha = .83$ for the WHOQOL-BREF total score and $\alpha = .86$ for SF-36. Both scales showed acceptable reliability in this comparative study (Castro et al., 2014).

Along with identifying and assessing the level of dysfunctional online behaviors, recommended treatment modalities are also available. In the next section, recommended treatment modalities and web-based counseling approaches are reviewed.

Treatment and CBT Conceptualization of Online Addictions

The first studies of online addictions originated in the United States (Young, 1996; Young, 1998a; Young, 1998b; Young, 2011a). Many studies also showed that online addictions were growing across the world, such as the United Kingdom (Widyanto & McMurran, 2004), China (Chang & Law, 2008), Italy (Ferraro et al., 2007), and Hungary (Demetrovics et al., 2012; Papay et al., 2013). There is no one specific approach as the primary intervention in order to treat Internet addiction (Abreu & Goes, 2011, p. 155). However, Young (2011a) suggested the CBT as the recommended treatment modality for online addictions.

Young (2011a) proposed a three-phase approach for treating online addictions. In phase one, the aim is for behavior modification that needs to be used in order to decrease

the amount of time spent on the Internet. Hence, the client's current use of the Internet needs to be assessed and a daily Internet use log needs to be used. In phase two, cognitive restructuring needs to be used in order to address maladaptive cognitions the users are denying. In this phase, cognitive therapy helps users realize how they justify their binge behavior on the Internet. In phase three, Young uses the harm reduction therapy model (Marlatt, Blume, & Parks, 2001) to identify any coexisting issues of the users that need to be treated because users often might have personal, situational, occupational, or social issues along with their dysfunctional online behaviors. People with addictions often think that stopping behavior for a while is enough for them to say that they are recovered (Young, 2011a). Therefore, Young focuses on underlying issues that have effects on problematic behavior in order to prevent relapse after the therapy.

Treatment modalities. Using the Internet to gather information regarding mental health issues, such as depression and anxiety, is common. Hence, there are both advantages and disadvantages of using the Internet to promote mental well-being among young adults (Clifton et al., 2013, p. 19). Advantages of Internet interventions are privacy and anonymity because intervention through the Internet provides what the client needs for privacy and comforts the client when discussing personal subjects that could motivate the client to accept treatment (Gainsbury & Blaszczynski, 2011, p. 295; Griffiths & Christensen, 2006). Although providing mental health services online has some limitations and questions about confidentiality, counselors need to address these potential areas in order to provide effective services to their clients.

In order to provide an effective counseling service, one of the crucial steps of assessment done by mental health providers should be to ask clients about their Internet usage and habits thereof, and be prepared to work with them (Clifton et al., 2013; Gowen, Deschaine, Gruttadara, & Markey, 2012) because the counselors would be better prepared to serve their clients and help them cope with their dysfunctional online behaviors when the counselor has a better picture of the clients' unhealthy or hidden problematic online behavioral patterns. Moreover, online help sites are also another platform to serve people. For example, over 30% of young adults, between the ages of 18-24, used the Internet to gain knowledge and look for an answer to mental health issues (Horgan & Sweeney, 2010). When the Internet is used predominantly to seek advice for depression and access mental health services, it might be interpreted as a stigma (Horgan & Sweeney, 2010) because having a mental health issue and seeking help for it might be seen as a taboo in some cultures. Therefore, information provided on the Internet should be reliable, up-to-date, and accurate; accessing that information should be confidential and secure; and the web-design of the web sites should be easy to use (Clifton et al., 2013).

Along with online help sites, media is also another platform to help make people aware of health related issues. For instance, meta-analyses of media campaigns (Derzon & Lipsey, 2002; Snyder & Hamilton, 2002) found that 4 to 8 % of the population who had seen media campaigns for health related issues would modify their unhealthy behavioral patterns (as cited in Brown & Bobkowski, 2011). This approximate number may look like a small representation of the general population; however, if those campaigns reach large audiences, the impact can be sizeable (Brown & Bobkowski, 2011, p. 106). For example, in the 1990s, research mainly focused on enhancing media campaigns' designs to prevent young adults from smoking and since then, these campaigns' impacts have been evaluated. Evaluations and results strengthen a principle that media campaign messages should be wisely shaped in order to attract an audience (Brown & Bobkowski, 2011, p. 106). Researchers have also found that news, messages, and reports that highlight risks and the negative effects of smoking, for example the opinion that "smoking harms others" and "people looking down on smokers", are the most successful tools to increase people's intentions of quitting smoking (Brown & Bobkowski, 2011, p. 106; Pechmann, Zhao, Goldberg, & Reibling, 2003, p. 8).

Regarding individual differences and aside from the research mentioned above, web-based counseling services could be another alternative to help individuals who cannot receive face-to-face counseling due to some conditions, such as disability or distance from service providers. Therefore, such individuals could benefit from distance counseling and improve the quality of their lives.

Online counseling / web-based therapy. There are many therapeutic approaches and treatment modalities, mostly based on self-help and CBT models (Bell, 2007; Ybarra & Eaton, 2005). Those models used several online approaches, including using counselors interacting with clients online, computer-based counseling with including the counselor at the minimum level, and non-counselor services that are fully computerized (Bell, 2007). MoodGYM (MoodGYM Training Program, n.d.) is one of the web-based

counseling applications which is a non-counselor online CBT software for treating depression that is free and open to anybody who wants to sign up (Bell, 2007).

Another extensive approach was used by Andersson et al. (2005) in order to expand a web-based CBT package for treating depression. This study compared two groups receiving (a) "a combination of online CBT with minimal therapist contact," and (b) "web-based discussion group participation with participation in a discussion group only." Study findings showed that both designs have significantly positive effects and an 84% completion rate for the program (Bell, 2007, p. 452).

The study findings presented above show that online counseling and web-based discussion groups are practical options that could be used to reach many individuals in an effective way for little or no cost. However, there are still some limitations associated with the use of web-based counseling packages. For instance, controlled trials might be used to assess effectiveness of the treatment and large sample sizes could be used to generalize the treatment efficacy and applicability of implemented treatment strategies (Bell, 2007). Moreover, potential ethical issues need to be considered and addressed by consulting with the ethical codes of counseling before providing mental health services through web-based applications.

Online counseling practices: ACA codes of ethics. Although web-based counseling has advantages, non-therapist approaches bring some ethical challenges. For instance, according to American Counseling Association's Code of Ethics (ACA, 2014),

counselors and their clients work jointly in devising integrated counseling plans that offer a reasonable promise of success and are consistent with abilities and circumstances of clients. Counselors and clients regularly review counseling plans to assess their continued viability and effectiveness, respecting the freedom of choice of clients (A.1.c, p. 4).

However, counselor and clients are not available to review counseling plans and assess the success of the therapy when the client receives counseling via non-therapist webbased counseling.

In counselor-client relationships,

counselors explicitly should explain to clients the nature of all services provided. They inform clients not only about the purposes, goals, techniques, and procedures, but also the limitations, potential risks, benefits of services and the counselor's qualifications, credentials, and relevant experience (ACA, 2014,

A.2.b, p. 4).

Additionally, "when providing technology assisted distance counseling services, counselors determine that clients are intellectually, emotionally, and physically capable of using the application, and the application is appropriate for the needs of the client" (ACA, 2014, H.4.c, p. 18). Nevertheless, a web-based non-therapist counseling approach has limitations and computer software cannot explain all information given above, such as engaging in role playing during counseling or practice with clients, and immediately providing help when a client needs instant help.

Moreover, "counselors communicate information in ways that are both developmentally and culturally appropriate. Counselors use clear and understandable language when discussing issues related to informed consent or counseling procedure" (ACA, 2014, A.2.c, p.4). On the other hand, web-based therapy is limited to language selection and cultural standardization; therefore, even though web-based therapy can offer mental health services to larger populations, it is impossible to offer counseling to everybody. For instance, the MoodGYM package is offered in only five languages: Chinese, English, Suomi, Norsk, and Nederlands (MoodGYM Training Program, n.d.).

"Sexual or romantic counselor-client relationships are prohibited" (ACA, 2014, A.5.a, p. 5). Web-based therapy protects clients from sexual or romantic counselor-client interactions and from potential harm. However, there are no written ethical codes if a counselor, who works for a non-therapist counseling center from where mental health counseling services are provided via computers, has contact with a client where nontherapist counseling takes place. Therefore, the Code of Ethics clearly states that "Counselors who engage in the use of distance counseling, technology, and social media within their counseling practice understand that they may be subject to laws and regulations of both the counselor's practicing location and the client's place of residence" (ACA, 2014, H.1.b, p. 17).

Nevertheless, it is still controversial which law would be applicable when a counselor provides mental health service to someone who resides in another state or country or continent. In web-based therapy, it is more complicated to find appropriate and applicable laws and statutes because a client can receive counseling from a counselor who lives in another state or country or continent.

As researchers examine the problems associated with excessive use of the Internet, and specific problems such as online gambling and online gaming, it is also worthwhile to consider the ways in which the Internet could be utilized to address such problems and provide psychoeducation and treatment options. The current study focused on problems associated with excessive use of the Internet. Specific research questions utilized in the study are outlined below.

Research Hypotheses

Research Hypothesis 1: There is a relationship between depression and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students.

Research Hypothesis 2: There is a relationship between quality of life and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students.

Summary

Problematic Internet use, online gaming behavior, online gambling behavior, depression, and quality of life were reviewed as the theoretical background of this study. Assessment instruments including a demographic questionnaire, the Beck Depression Inventory-II (Beck, Steer, & Brown, 1996), the World Health Organization Quality of Life Questionnaire-BREF (The WHOQOL Group, 1998), the Internet Addiction Test (Young, 1998b), the Problematic Online Gaming Questionnaire (Demetrovics et al., 2012), and the Gambling Symptom Assessment Scale (Kim et. al, 2009 were reviewed and their purposes in the study were discussed. Treatment modalities and counseling treatment services were briefly examined. In the next chapter, the methods utilized in the current study are addressed.

Chapter 3: Methodology

Introduction

The review of literature in the previous chapter presented the context in order to understand the importance of Internet related problematic behaviors. The aim of this study was to explore the prevalence and extent of problematic Internet use, online gaming behavior, and online gambling behavior, and their relationships with depression and quality of life among college students.

Grounded in prior research, depression (Beck, Steer, Ball, et al., 1996; Brown & Bobkowski, 2011; Harrison & Hefner, 2008), quality of life (Berlim et al., 2005; Castro et al., 2014; Krageloh et al., 2013), problematic Internet use (Lee, 2009; Widyanto & McMurran, 2004; Young, 1998b), online gaming behavior (Demetrovics et al., 2012; Linderoth & Ohrn, 2014; Papay et al., 2013), and online gambling behavior (Hornle & Zammit, 2010; Kim et al., 2009) have been identified as variables in the present study.

The independent variables are problematic Internet use, online gaming behavior, and online gambling behavior; the dependent variables are depression and quality of life. This chapter outlines the research methodology of the current study including the analyses that are utilized to test the research questions. The research was conducted in a single phase by using a quantitative approach. Data were obtained through an online survey that was completed by undergraduate and graduate student participants at a large public Midwestern university in the USA.

The research design that provides operational definitions of the variables, sampling plan, participants, instrumentation, and procedures for data collection, as well as analysis are presented in the chapter. Limitations and ethical issues of the present study are also presented at the end of this chapter.

Research Questions and Hypotheses

Literature presents relationships between dysfunctional online behaviors, such as Internet addiction, online gaming, and online gambling, and mental health (Brown & Bobkowski, 2011; Ceyhan & Ceyhan, 2008; Chen, 2012). Although problematic Internet use and mental health issues are positively correlated, it is difficult to determine a causal relationship between those variables with human subjects due to ethical concerns and difficulty of clinical research. More research needs to be done in order to assess whether problematic Internet use causes mental health issues or mental health issues cause problematic Internet use (Caplan, 2002: Ceyhan & Ceyhan, 2008; Morahan-Martin, 1999). The current study will address the following:

Descriptive Question: What is the prevalence of problematic Internet use among college students?

Research Question 1: Is there a relationship between depression and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students?

Research Hypothesis 1: There is a relationship between depression and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students.
Research Question 2: Is there a relationship between quality of life and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students?

Research Hypothesis 2: There is a relationship between quality of life and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students.

Research Design

As the independent variables (problematic Internet use, online gaming behavior, and online gambling behavior) could not be manipulated by the researcher, this study utilized a non-experimental research design by employing quantitative research methodology. This study may be further classified as a cross-sectional design as it is based on an observation of a number of variables (depression, quality of life, problematic Internet use, online gaming behavior, and online gambling behavior) occurring at the same point in time, without repeated measures (Cohen, Manion, & Morrison, 2007).

Variables

The variables of this study include demographic variables; depression as measured by the Beck Depression Inventory-II (Beck, Steer, & Brown, 1996); quality of life as measured by the World Health Organization Quality of Life Questionnaire-BREF (The WHOQOL Group, 1998); problematic Internet use as measured by the Internet Addiction Test (Young, 1998b); online gaming behavior as measured by the Problematic Online Gaming Questionnaire (Demetrovics et al., 2012); and online gambling behavior as measured by an adapted version of the Gambling Symptom Assessment Scale (Kim et al., 2009).

Demographic Questionnaire: Demographic questions identify participants' age, gender, race/ethnicity, grade level, GPA, residential status, participation in clubs, employment status, and average weekly Internet usage time.

The Beck Depression Inventory-II: BDI-II is a 21-item multiple-choice self-report inventory designed to measure the severity of depression (Beck, Steer, & Brown, 1996). *The World Health Organization Quality of Life Questionnaire-BREF:* WHOQOF-BREF is a 26-item questionnaire designed to measure an individual's quality of life (The WHOQOL Group, 1998).

The Internet Addiction Test: IAT is a 20-item Likert scale instrument designed to measure Internet addiction (Young, 1998b).

The Problematic Online Gaming Questionnaire: POGQ is an 18-item questionnaire designed to measure problematic and non-problematic online gaming behavior (Demetrovics et al., 2012).

The Online Gambling Symptom Assessment Scale: OGSAS is a 12-item scale designed to measure the severity of gambling behavior (Kim et al., 2009). It has been adapted for this study to measure the severity of online gambling behavior.

Population

The accessible population in the study was approximately N = 7,173 for the summer. There were approximately 5,381 undergraduate, 1,481 graduate, and 311

medical students. The summer student population contained 3,671 females and 3,502 males, 5,265 white, 339 African-American or black, and 1,569 other races/ethnicities. Demographics data showed that 5,385 students were residents and 1,788 non-residents, 121 living on-campus and living 7,052 off-campus, 2,413 full-time and 4,760 part-time from a large public Midwestern university in the USA who were enrolled in 2015-2016 school year (Ohio University Institutional Research, 2015).

Sample

Owing to accessibility of the whole population, an online tool was used to reach the whole population to collect data. Thus, each individual had an equal probability of being selected from the population (Cohen et al., 2007; Keppel, 1991). The respondents of the study were volunteers who attended any undergraduate or graduate programs at a large public Midwestern university in the USA. A web-design survey link created via Qualtrics was emailed to these undergraduate and graduate students by the university's Office of Information Technology. Two weeks after the first email, a follow up email was sent to students through the Office of Information Technology. If the researcher did not reach the required sample size through the first two steps, the researcher would contact individual students in order to collect sufficient data. Participants who volunteered to complete the survey were able to read the instructions and complete the survey online.

The total sample size needed was determined by using a statistical power analysis. For this study, a .25 estimated p^2 value was desired at an alpha level of .05 with a selected level of cross-validity shrinkage was limited to .20 with three predictors. The Precision Efficacy Analysis for Regression (PEAR) method (Brooks & Barcikowski, 2012) determined that the number of participants needed for this study was n = 112.

In order to answer the exploratory questions, a two-sample t-test analysis conducted and participants were divided into two groups. To estimate the sample sizes of these two groups, the alpha level of .05 and .80 level of statistical power were desired. Based on this, 64 participants were needed for each group. The number of participants needed for this study was n = 128 (Cohen, 1988; Kenny, 1987).

Instrumentation

Five instruments were selected to measure the variables being studied. A webbased survey packet was developed for this study and consisted of a demographic questionnaire, the Beck Depression Inventory-II (BDI-II) (Beck, Steer, & Brown, 1996), the WHO Quality of Life Scale-BREF (WHOQOL-BREF) (The WHOQOL Group, 1998), the Internet Addiction Test (IAT) (Young, 1998b), the Problematic Online Gaming Questionnaire (POGQ) (Demetrovics et al., 2012), and an adapted version of the Gambling Symptom Assessment Scale (G-SAS) as the Online Gambling Symptom Assessment Scale (OGSAS) (Kim et al., 2009) that were converted into a web-based survey via Qualtrics. The research was carried out after receiving approval from the Institutional Review Board (IRB). Data for this study were collected through a web-based survey via Qualtrics. Each of the instruments used in this study is described in the following section.

Demographic questionnaire. The questionnaire contained demographic questions in order to identify participants' age, gender, race/ethnicity, grade level, GPA,

residential status, participation in clubs, employment status, and average weekly Internet using time (see Appendix A).

The Beck Depression Inventory-II. The Beck Depression Inventory (BDI) was first published in 1961 (Beck et al., 1961) and was updated in 1996 as the BDI-II (Beck, Steer, & Brown, 1996). The BDI-II is comprised of twenty-one multiple-choice questions. Each question has four possible statements to select from with values for statements ranging from 0 to 3. Statements with a value of three endorse the most severe degree of depressive symptoms, and ratings of zero indicate the absence of depressive symptoms. The total score on the BDI-II can range from 0 to 63. The symptoms assessed in the BDI-II are

(a) mood, (b) pessimism, (c) sense of failure, (d) lack of satisfaction, (e) guilt feelings, (f) sense of punishment, (g) self-dislike, (h) self-accusation, (i) suicidal wishes, (j) crying, (k) irritability, (l) social withdrawal, (m) indecisiveness, (n) distortion of body image, (o) work inhibition, (p) sleep disturbance, (q) fatigability, (r) loss of appetite, (s) weight loss, (t) somatic preoccupation, and (u) loss of libido (Beck et al., 1988, p. 79).

The BDI-II can be administered by trained interviewers or self-administered. The instrument generally takes 5-to-10 minutes to complete and is scored by summing the ratings given to each of the items (Beck et al., 1988, p. 79). Based on the BDI-II scoring, total scores ranging from 0 to 13 represent "minimal depression;" total scores from 14 to 19 are indicative of "mild depression;" total scores from 20 to 28 represent "moderate

depression;" and total scores from 29 to 63 are representative of "severe depression" (Beck, Steer, Ball, et al., 1996, p. 590).

Beck, Steer, Ball, et al. (1996) reported that the BDI-II has acceptable reliability and validity, test-retest reliability was r = .93, p < .001" (p. 590), the Cronbach's alpha reliability coefficient was $\alpha = .92$ (Beck, Steer, Ball, et al., 1996; Pearson Clinical, n.d., para. 5).

Examples of the items include:

Example 1:

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

Example 2:

- 0 I have not experienced any change in activity level.
- 1a I am somewhat more active than usual.
- 1b I am somewhat less active than usual.
- 2a I am a lot more active than usual.
- 2b I am a lot less active than usual.
- 3a I am not active most of the day.

3b – I am active all of the day (Beck, Steer, & Brown, 1996).

The World Health Organization (WHO) Quality of Life Scale. The WHO

Quality of Life - BREF (WHOQOL-BREF) is a twenty-six item, Likert scale assessment.

The WHOQOL-BREF has four domains that are "(a) physical health, (b) psychological health, (c) social relationships, and (d) environment." (The WHOQOL Group, 1998, p. 551). "The WHOQOL-BREF was developed by the WHOQOL Group with fifteen international field centers, simultaneously, in an attempt to develop a quality of life assessment that would be applicable cross-culturally" (World Health Organization [WHO], 1996, p. 5) and would focus on individual opinions about one's quality of life (The WHOQOL Group, 1998; Castro et al., 2014).

The results showed that WHOQOL-100, the original version of the WHOQOL-BREF, and WHOQOL-BREF, an abbreviated version of the WHOQOL-100, domain scores were very similar. There were high correlations between WHOQOL-100 and WHOQOL-BREF, ranging from r = .89 to r = .95. For internal consistency, the Cronbach's alpha reliability coefficients ranged from $\alpha = .66$ to $\alpha = .84$ for domains (The WHOQOL Group, 1998, p. 554).

According to Skevington, Lofty, and O'Connell (2004), WHOQOL-BREF has excellent psychometric properties. In a New Zealand sample, Krageloh et al. (2013) found that the Cronbach's alpha reliability coefficient for the total score was $\alpha = .91$ and subscale reliability coefficients ranged from $\alpha = .71$ to $\alpha = .82$, these were $\alpha = .71$ for the social domain, $\alpha = .80$ for the physical health domain, $\alpha = .81$ for the environment domain, and $\alpha = .82$ for the psychological health domain. Further, criteria related validity were assessed by correlation item and domain scores with items 1 (global quality life) and 2 (global health). Items 1 and 2 were significantly correlated with all 24 remaining items (Krageloh et al., 2013, p. 1452). Castro et al. (2014) compared the reliability and convergent validity of instruments assessing quality of life in a Brazilian sample. They found the Cronbach's alpha reliability coefficients were $\alpha = .83$ for the WHOQOL-BREF total score and $\alpha = .86$ for SF-36 (survey health status). Both scales showed acceptable reliability in this comparative study (p. 65).

Examples of the items include "How would you rate your quality of life?" "How satisfied are you with your health?" and "To what extent do you feel that physical pain prevents you from doing what you need to do?" (WHO, 1996, p. 17). Response options for questions number 1 and 15 are:

- 1 Very poor
- 2 Poor
- 3 Neither poor nor good
- 4-Good
- 5 Very good

Responses for questions number 2, 16, 17, 18, 19, 20, 21, 22, 23, 24, and 25 are:

- 1 Very dissatisfied
- 2-Dissatisfied
- 3 Neither satisfied or dissatisfied
- 4 Satisfied
- 5 Very satisfied

Responses for questions number 3, 4, 5, and 6 are:

1 - Not at all

- 2 A little
- 3 A moderate amount
- 4 Very much
- 5 An extreme amount

Responses for questions number 7, 8, and 9 are:

- 1 Not at all
- 2 A little
- 3 A moderate amount
- 4 Very much
- 5 Extremely

Responses for questions number 10, 11, 12, 13, and 14 are:

- 1 Not at all
- 2 A little
- 3 Moderately
- 4 Mostly
- 5 Completely

Responses for question number 26 are:

- 1 Never
- 2-Seldom
- 3 Quite often
- 4 Very often

5 – Always

After reversing three items, the possible raw score ranges for each domain are as follows: (a) physical health = 28, (b) psychological health = 24, (c) social relationships = 12, and (d) environment = 32 (WHO, 1996).

The Internet Addiction Test. The Internet Addiction Test is a twenty-item Likert scale instrument designed to measure Internet addiction. Young (1998b) first designed the IAT in order to measure the addictive Internet use. It is one of the most widely used screening instruments for Internet addiction. Young adopted the DSM-IV pathological gambling criteria to relate the Internet use (Widyanto & McMurran, 2004), but she did not conduct a validation study of the instrument. Widyanto and McMurran (2004) conducted the first validation study of the IAT and reported that the IAT has high face validity, but it has not been subjected to psychometric testing. Their factor analysis showed that the IAT has good internal consistency and concurrent validity (p. 443).

The IAT has six components to measure Internet use that are (a) salience, (b) excessive use, (c) neglecting work, (d) anticipation, (e) lack of control, and (f) neglecting social life (Widyanto & McMurran, 2004, p. 446). "The minimum score is 0 and the maximum score is 100. The higher score represents the greater the problems Internet use causes" (Widyanto & McMurran, 2004, p. 445). Scores of 30 and below show that the person is an average on-line user. Scores of 31 and above shows that the person is experiencing problems because of the Internet use (Young, n.d.).

Frangos, Frangos, and Sotiropoulos's (2012) meta-analysis indicated the overall Cronbach's alpha reliability coefficients computed from studies using the IAT was $\alpha =$.88. The mean differences also showed that it is more reliable with college students compared to pre-college students (Frangos, Frangos, & Sotiropoulos, 2012, p. 369).

The IAT has also been translated into Turkish. The participants for this study were 480 children, ranging in age from 12 years old to 17 years old. In this Turkish sample, the Cronbach's alpha internal reliability coefficient for the whole test was α = .90 (Keser, Esgi, Kocadag, & Bulu, 2013, p. 207).

Examples of the items include "How often do you find that you stay on-line longer than you intended?" "How often do you neglect household chores to spend more time on-line?" and "How often do your grades or school work suffers because of the amount of time you spend on-line?" (Net Addiction, n.d.) Possible responses are:

- 0 Not Applicable
- 1 Rarely
- 2 Occasionally
- 3 Frequently
- 4-Often
- 5 Always

The total score on the IAT can range from 0 to 100, the higher the score range, the greater the level of addiction. The scores ranging from 0 to 30 represent normal use of Internet; total scores from 31 to 49 represent "mild Internet addiction;" total scores from 50 to 79 represent "moderate Internet addiction;" and total scores from 80 to 100 represent "severe Internet addiction" (Young, n.d., para. 5)

In a US sample, Jelenchick et al. (2012) collected data from undergraduate students, aged 18-20, enrolled at two public universities in the US. Out of 307 eligible students, 224 participants responded to the online survey. The researchers excluded incomplete surveys and ended up with 215 complete surveys (99 males and 116 females) for their analysis. The average age of the participants was 18.8 years old. The researchers received approximately half of their data from one university and the other half from the other university. For the exploratory factor analysis, the researchers generated two interpretable factors for the IAT. The Cronbach's alpha reliability coefficients were α = .83 and α = .91 for the factors. The researchers also found a moderate linear correlation between the two factors, *r* = .57. Factor one accounted for 73% of the variance compared to factor two that only accounted for 17% of the variance (Jelenchick et al., 2012, p. 298).

The Problematic Online Gaming Questionnaire. The Problematic Online Gaming Questionnaire (POGQ) developed by Demetrovics et al. (2012). POGQ is an eighteen-item Likert scale instrument designed to measure problematic online gaming behavior. The aim of this instrument is to measure problematic gaming behavior among all genres and gamer populations. The minimum score is 18 and the maximum score is 90. The cut-off score is 66 for problematic gamers (Demetrovics et al., 2012).

In a study with the Hungarian adolescents sample, Papay et al. (2013) found the correlations between factors (preoccupation, immersion, withdrawal, overuse, interpersonal conflict, and social isolation) ranged from r = .57 to r = .82. Based on confirmatory factor analysis, the composite reliability of each dimension was greater than r = .60. Papay et al. (2013) found the Cronbach's alpha reliability coefficient for the test

was $\alpha = .91$. Kiraly et al. (2014) also found that the Cronbach's alpha internal reliability coefficient for the test was $\alpha = .93$ in another study with Hungarian participants (p. 750).

Examples of the items include "When you are not gaming, how often do you think about playing a game or think about how would it feel to play at that moment?" "How often do the people around you complain that you are gaming too much?" and "How often do you neglect other activities because you would rather game?"

(Demetrovics et al., 2012, p. 4). Possible responses are:

- 1 Never
- 2-Seldom
- 3 Occasionally
- 4-Often
- 5 Almost always / Always

The Gambling Symptom Assessment Scale. The Gambling Symptom

Assessment Scale is a twelve-item self-rated scale designed to measure gambling symptom severity (Kim et al., 2009). The G-SAS has combined the concepts used in the Leyton Obsessional Inventory (LOI) developed by Cooper (Cooper, 1970) and the Yale-Brown Obsessive Compulsive Scale (YBOCS) developed by Goodman et al. (Goodman et al., 1989a, 1989b). Each item has a score ranging from 0 to 4. The total score range from 0 to 48, 8-20 for mild, 21-30 for moderate, 31-40 for severe, and 41-48 for extreme gambling behavior symptoms. All items ask for an average symptom based on the past seven days. Items 1-4 ask for the average use, 5-7 ask for the average frequency, item 8 asks for the time spent on gambling or gambling related behavior, item 9 asks for excitement caused by the gambling act, item 10 asks for excitement or pleasure associated with winning, item 11 asks for emotional distress, and item 12 asks for personal trouble (Kim et al., 2009, p. 77).

Kim et al. (2001) found that the Cronbach's alpha reliability coefficient was α = .89 for internal consistency of the previous version of the G-SAS. When compared with the Pathological Gambling Clinical Global Impression (PG-CGI), the G-SAS showed a good convergent validity, *r* values range from .67 to .82 during three weeks of the study period (Kim et al., 2001). Kim et al. (2009) found that the Cronbach's alpha reliability coefficient was α = .86 of the current version of the G-SAS. Test-retest simple correlation for the current version of the G-SAS was .56. Also, validation analysis (*N* = 207) showed that the Spearman correlations coefficient between the total scores of the YBOCS and the G-SAS was good, *rho* = .51 (Kim et al., 2009, p. 79).

Examples of the items include "If you had unwanted urges to gamble during the past WEEK, on average, how strong were your urges?" "During the past WEEK, how many hours (add up hours) were you preoccupied with your urges to gamble?" and "During the past WEEK, approximately how much total time did you spend gambling or on gambling related activities?" (Kim et al., 2009, pp. 81-82). In order to modify the G-SAS for the purpose of this study, the researcher will add the word "online" to the questionnaire with the author's permission.

Possible responses for item number 1, 11, and 12 are:

0 - None

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1 - Mild

- 2-Moderate
- 3-Severe
- 4-Extreme

Possible responses for item number 2 are:

- 0-None
- 1 Once
- 2 Two or three times
- 3 Several to many times
- 4-Constant or near constant

Possible responses for item number 3 are:

- 0-None
- 1-1 hour or less
- 2-1 to 7 hours
- 3-7 to 21 hours
- $4 Over \ 21 \ hours$

Possible responses for item number 4 are:

- 0 Complete
- 1 Much
- 2-Moderate
- 3-Minimal
- $4 No \ control$

Possible responses for item number 5 are:

- 0-None
- 1 Once
- 2 Two or four times
- 3 Several to many times
- 4 Constantly or near constantly

Possible responses for item number 6 are:

- 0 None
- 1 1 hour or less
- 2-1 to 7 hours
- 3-7 to 21 hours
- 4 Over 21 hours

Possible responses for item number 7 are:

- 0 Complete
- 1 Much
- 2-Moderate
- 3-Minimal
- 4 None

Possible responses for item number 8 are:

- 0 None
- 1-2 hours or less
- 2-2 to 7 hours
- 3-7 to 21 hours

4 – Over 21 hours

Possible responses for item number 9 and 10 are:

- 0 None
- 1 Minimal
- 2-Moderate
- 3 Much
- 4 Extreme

Data Collection Procedures

This study employed quantitative methodology for data collection and analysis. Data were collected through the administration of a web-design survey developed via Qualtrics for the study. Efforts were made to collect data from a minimum of 128 participants to ensure sufficient statistical power of analysis. Upon approval from the researcher's Doctoral Committee and university's IRB, the researcher requested a broadcast email from the University Office of Information Technology in order to administer the study survey online. Two weeks after the first email, a follow up email was sent through the University Office of Information Technology. The researcher collected data after receiving approval from the Doctoral Committee and university's IRB and continued to collect data until the end of Summer semester of 2016.

After receiving approval from the Office of Information Technology, the researcher sent the survey link to all undergraduate and graduate students at a large public Midwestern university in the USA and collect data. Students who wanted to participate in the study were instructed to simply click on the link in the email and complete the survey. Confidentiality was ensured and no personally identifying information was requested on the survey. The entire procedure was completed online and took approximately 20 minutes to complete.

Data Analysis Procedures

After the data are collected, the researcher screened data for missing values. Each survey was checked and scored with the results recorded in a Statistical Package for the Social Science (SPSS) data file. For the purpose of data analysis, all scales were used in total rather than as subscales. Data analyses were conducted using the IBM SPSS program and were organized around the research questions and null hypotheses. The following procedures describing the statistical tests were employed to address the research questions.

Descriptive statistics were provided for demographic information. Reliability and validity analysis were performed for the data. In order to test the assumptions of analysis, a statistical analysis was performed by using the IBM SPSS. First, the Pearson correlation was performed to assess the relationships among depression, quality of life, problematic Internet use, online gaming behavior, and online gambling behavior. Following the correlational analysis, hierarchical multiple linear regression analyses were performed. The first research question analyzed the relationship between independent variables: problematic Internet use, online gaming behavior, and online gambling behavior, and the dependent variable: depression. The second research question analyzed the relationship between independent variables: problematic Internet use, online gaming behavior, and online gambling behavior, and online gaming behavior, and online gambling behavior, and online gaming behavior, and the dependent variable: the quality of life. In order to

identify outliers, the researcher analyzed descriptive statistics, extreme values, histogram, and boxplot that were created by the IBM SPSS. The researcher analyzed data with and without outliers and compared the results in order to decide if outliers needed to be removed from the data. Exploratory analyses were performed.

Limitations

There were some limitations associated with the current study. The actual sample of respondents was a small percentage of the accessible population due to sampling procedure that limited the generalizability of findings. Although the survey was designed as a self-report questionnaire, the participants might not feel comfortable answering instruments honestly, given the sensitive nature of the questions, which might have affected reliability of the data. No casual conclusion could be drawn from the data since the present study was not clinical.

Ethical Issues

The researcher did not expect any risks associated with participating in the study or ethical issues while collecting data, but there might be a potential of feeling uncomfortable due to wording of instrument items. For example, participants might feel discomfort while answering the Beck Depression Inventory-II. Therefore, the researcher recommended participants who felt discomfort to contact Counseling and Psychological Services at the university to receive help. In order to ensure confidentiality, the researcher did not collect any identifying information from participants other than demographic information.

Summary

This chapter presented the methodology for this study including research design, data collection, and analysis procedures. A minimum of 128 participants would be drawn from graduate and undergraduate students in a large public Midwestern university in the USA. Reliability for each instrument was analyzed and reported. Multiple linear regression analyses were conducted to assess (a) the relationship between independent variables: problematic Internet use, online gaming behavior, and online gambling behavior, and the dependent variable: depression, and (b) the relationship between independent variables: problematic Internet use, online gaming behavior, and online gambling behavior, and the dependent variable: the quality of life. The researcher performed t-test analyses in order to answer exploratory questions.

Chapter 4: Results

This chapter presents the results of the data analyses of the descriptive and research questions of the study presented in chapter three. Furthermore, this chapter presents the results of the preliminary and supplementary analyses. Data screening procedures, descriptions of the sample, and reliability and validity of the instruments are also presented.

Data Screening Procedures

I examined valid, invalid, and missing data, and calculation of the means and standard deviations of the variables of this study through data screening procedures. First, I screened the data in order to identify invalid and missing data of the participants. The total number of collected surveys was 348. After screening the data, 126 invalid surveys were identified. Due to partially completed instruments, lack of demographic information, and one or more totally incomplete instruments on the survey, these invalid surveys were eliminated from the data set. Two hundred and twenty two valid surveys were used in the data analyses. With 222 usable surveys out of 348, the response rate was 5% from 7,056 enrolled students in the summer.

Preliminary Analyses

Preliminary analyses are presented as reliability and validity of the instruments. Descriptive statistics and the assumptions of linear regression are also presented.

Description of the Sample

Of the final sample of 222 participants, the mean age of participants was 25.04 years, with a range between 18 and 69, and a standard deviation of 7.07 years. Eighty-

seven of the participants were male (39.2%) and 135 of the participants were female (60.8%). One hundred sixty six participants identified themselves as White, nine identified as African-American, one identified as American Indian or Alaska Native, three identified as Hispanic, Latino, or Spanish origin, 14 identified as Asian-American, and 28 identified as other, such as Asian, Middle-Eastern, Black, and Multiple-Race. One person did not indicate his/her racial-ethnic identity. The sample included 18 freshmen, 33 sophomores, 33 juniors, 50 seniors, 40 masters, and 48 doctoral students. Of these participants, 195 students were enrolled full-time, 24 were part-time, and three students did not indicate their student enrollment status. The mean GPA of the students was 3.40, with a range between 1.80 and 4.00 with a standard deviation of .53. Forty-one students resided on-campus and 181 students resided off-campus. Ninety-one students indicated that they participated in clubs and activities, 131 students indicated that they did not participate in clubs and activities. One hundred forty three students were employed and 79 were not employed. Participants ranked the technology tools they use the most as mobile phone (n = 107), laptop computer (n = 99), tablet (n = 79), and desktop computer (n = 69).

Table 1

Descriptive Statistics of Age and GPA

		Ra	nge			
Variable	n	min	max	М	SD	Skew
Age	222	18	69	25.04	7.06	2.34
GPA	213	1.80	4.00	3.40	.53	84

Table 2

Variable	Level/Category	n	Percent
Gender	Male	87	39.2
	Female	135	60.8
	Total	222	100
Race and Ethnicity	White or Caucasian	166	74.8
	African-American	9	4.1
	American Indian or Alaska Native	1	.5
	Hispanic, Latino, or Spanish origin	3	1.4
	Asian-American	14	6.3
	Other	28	12.6
	Missing	1	.5
	Total	222	100
Class	Full-time	195	87.8
	Part-time	24	10.8
	Missing	3	1.4
	Total	222	100
Residential	On-campus	41	18.5
	Off-campus	181	81.5
	Total	222	100
Activities and Clubs	Yes	91	41
	No	131	59
	Total	222	100
Employment	Yes	143	64.4
	No	79	35.6
	Total	222	100

Descriptive Statistics of Demographic Variables

Testing the Descriptive Question

Descriptive question. What is the prevalence of problematic Internet use among college students?

Within the past six months, 15 students indicated that they spent 1-10 hours per week online, 66 students indicated that they spent 11-20 hours per week online, 61 students indicated that they spent 21-30 hours per week online, 40 students indicated that they spent 31-40 hours per week online, and 40 students indicated that they spent 40 or more hours per week online. According Ko et al. (2007) 20 hours of usage is considered as problematic. However, they did not specify what is considered problematic as the purpose of the use, such as professional or leisure use. This issue will be discussed in the discussion section.

Table 3

Weekly Internet Usage Statistics

n	Percent
15	6.8
66	29.7
61	27.5
40	18.0
40	18.0
222	100.0
	n 15 66 61 40 40 222

Descriptive Statistics of Study Variables

Descriptive statistics, including the means, standard deviations, the range of study variables, and skewness, are presented in Table 4. Minimum and maximum scores for the IAT were 0 and 5, POGQ 1 and 5, OGSAS 0 and 4, BDI-II 0 and 3, where higher score were of greater concerns, and the WHOQOL 1 and 5, where lower scores were of concern.

Table 4

Descriptive Statistics of Study Variables

				Ra	nge	
Variables	n	М	SD	min	max	skew
IAT	222	1.48	.62	.15	3.60	.41
POGQ	222	1.55	.65	1.00	3.66	1.01
OGSAS	222	.09	.21	.00	1.66	3.48
BDI-II	222	.51	.49	.00	2.38	1.31
WHOQOL1	222	3.77	.57	2.15	5.00	38

IAT, POGQ, OGSAS, and BDI-II are positively skewed. IAT is skewed, but more symmetric than others with a skewness score of .41. For POGQ, OGSAS, and BDI-II, skewness is substantial, distributions are highly skewed, and scores are greater than one, POGQ is 1.01, OGSAS is 3.48, and BDI-II is 1.31. WHOQOL is negatively skewed, distribution is approximately symmetric with a skewness score of -.38. Distribution figures of the current study variables are presented below.

¹ WHOOQL refers to WHOQOL-BREF. Therefore, WHOQOL acronym will be used in the rest of the document.



Figure 1. Distribution of IAT



Figure 2. Distribution of POGQ



Figure 3. Distribution of OGSAS



Figure 4. Distribution of BDI-II



Figure 5. Distribution of WHOQOL

The correlation statistics are presented in Table 5. Results show that the following pairs of variables are significantly correlated with each other, IAT and POGQ (r = .51, p < .01), IAT and OGSAS (r = .18, p < .01), IAT and BDI-II (r = .37, p < .01), IAT and WHOQOL (r = ..44, p < .01), POGQ and OGSAS (r = .25, p < .01), POGQ and BDI-II (r = .14, p < .05), POGQ and WHOQOL (r = ..17, p < .01), OGSAS and WHOQOL (r = ..13, p < .05), and BDI-II and WHOOQL (r = ..74, p < .01). There was a nonsignificant correlation between OGSAS and BDI-II (r = .07, p > .05).

Table 5

		1	2	3	4	5
1	IAT	-				
	Sig (2-tailed)	-				
2	POGQ	.51**	-			
	Sig (2-tailed)	.00				
3	OGSAS	.18**	.25**	-		
	Sig (2-tailed)	.00	.00			
4	BDI-II	.37**	.14*	.07	-	
	Sig (2-tailed)	.00	.03	.23		
5	WHOQOL	44**	17**	- .13 [*]	74**	-
	Sig (2-tailed)	.00	.00	.03	.00	
*p	<.05 (2-tailed) ** <i>p</i> < .0	1 (2-tailed)				

Correlations of Study Variables

Reliability

Reliability analyses of the instruments showed that the instruments had a high level of reliability. Cronbach's alpha reliability coefficient for IAT was .90, POGQ was .95, OGSAS was .73, BDI-II was .92, and WHOQOL was .92.

Validity of IAT

Principal Component Analysis with Promax (orthogonal) rotation was conducted on the data from the sample of 222. The minimum acceptable measure of sampling adequacy value is considered as .6 in order to conduct a factor analysis (Kaiser, 1974).

The Kaiser-Meyer-Olkin sample of measuring adequacy value suggested that the sample was factorable (KMO = .90), and it was previously reported that the IAT had two factors (Jelenchick et al., 2012). The present study analysis suggested a four-factor

solution (see Table 7). Factor 1 (nine items) accounts for 38.51% of the total variance of IAT. Factor 2 (five items) accounts for 6.9% of the total variance. Factor 3 (two items) accounts for 6.26% of the total variance. Factor 4 (four items) accounts for 5.24% of the total variance. The pattern matrix of the IAT items can be seen in the Appendices (see Appendix F).

Table 6

IAT Measure of Sampling Adequacy

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.90
	Approx. Chi-Square	1792.87
Bartlett's Test of Sphericity	df	190
	Sig.	.00

Table 7

IAT Factor Loadings

		Initial Eigen	values	Extractio	on Sums of Sq	uared Loadings
Component	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	7.70	38.51	38.51	7.73	38.54	38.54
2	1.38	6.90	45.41	1.38	6.93	45.47
3	1.25	6.26	51.68	1.24	6.29	51.66
4	1.05	5.24	56.93	1.05	5.28	56.94
Note. Extraction Method: Principal Component Analysis.						

Validity of POGQ

Principal Component Analysis with Promax (orthogonal) rotation was conducted

on the data from the sample of 222. The Kaiser-Meyer-Olkin sample of measuring adequacy value suggested that the sample was factorable (KMO = .93). It was previously reported that the POGQ had six factors (Papay et al., 2013). The current study analysis suggested a two-factor solution (see Table 9). Factor 1 (ten items) accounts for 58.94% of the total variance of POGQ. Factor 2 (eight items) accounts for 6.98% of the total variance. The pattern matrix of the POGQ items can be seen in the Appendices (see Appendix G).

Table 8

POGQ Measure of Sampling Adequacy

Kaiser-Meyer-Olkin Measure	.93	
Bartlett's Test of Sphericity	Approx. Chi-Square	3406.28
	df	153
	Sig.	.00

Table 9

POGQ Factor Loadings

		Initial Eigen	values	Extraction	on Sums of Sq	uared Loadings
Component	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	10.60	58.94	58.94	10.60	58.94	58.94
2	1.25	6.98	65.92	1.25	6.98	65.92
Note. Extraction Method: Principal Component Analysis.						

Validity of OGSAS

Principal Component Analysis with Promax (orthogonal) rotation was conducted

on the data from the sample of 222. The Kaiser-Meyer-Olkin sample of measuring adequacy value suggested that the sample was factorable (KMO = .73). G-SAS had single factor (Kim et al., 2009). The current study analysis suggested a five-factor solution (see Table 11). Factor 1 (three items) accounts for 38.71% of the total variance of OGSAS. Factor 2 (three items) accounts for 14.33% of the total variance. Factor 3 (two items) accounts for 10.94% of the total variance. Factor 4 (two items) accounts for 10.21% of the total variance. Factor 5 (two items) accounts for 9.07% of the total variance. The pattern matrix of the OGSAS items can be seen in the Appendices (see Appendix H).

Table 10

OGSAS Measure of Sampling Adequacy

Kaiser-Meyer-Olkin Measure	of Sampling Adequacy	.73
Bartlett's Test of Sphericity	Approx. Chi-Square	1418.11
	df	66
	Sig.	.00

Table 11

OGSAS Factor Loadings

		Initial Eigen	values	Extracti	on Sums of So	quared Loadings
Component	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	4.64	38.71	38.71	4.64	38.71	38.71
2	1.72	14.33	53.04	1.72	14.33	53.04
3	1.31	10.94	63.99	1.31	10.94	63.99
4	1.22	10.21	74.20	1.22	10.21	74.20
5	1.08	9.07	83.28	1.08	9.07	83.28
<i>Note</i> . Extraction Method: Principal Component Analysis.						

Validity of BDI-II

Principal Component Analysis with Promax (orthogonal) rotation was conducted on the data from the sample of 222. The Kaiser-Meyer-Olkin sample of measuring adequacy value suggested that the sample was factorable (KMO = .93). It was previously reported that the BDI-II had single factor (Beck, Steer, Ball, et al., 1996). The analysis suggested a three-factor solution (see Table 13). Factor 1 (eleven items) accounts for 42.85% of the total variance of BDI-II. Factor 2 (eight items) accounts for 7.41%, and factor 3 (two items) accounts for 5.5% of the total variance. The pattern matrix of the BDI-II items presented in the Appendices (see Appendix I).

Table 12

BDI-II Measure of Sampling Adequacy

Kaiser-Meyer-Olkin Measur	e of Sampling Adequacy	.93
Bartlett's Test of Sphericity	Approx. Chi-Square	2180.22
	df	210
	Sig.	.00

Table 13

BDI-II Factor Loadings

	Initial Eigenvalues			Extraction Sums of Squared Loadings			
Component	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	
1	9.00	42.85	42.85	9.00	42.85	42.85	
2	1.55	7.41	50.27	1.55	7.41	50.27	
3	1.15	5.50	55.77	1.15	5.50	55.77	
Note. Extraction Method: Principal Component Analysis.							

Factor Analysis of WHOQOL

Principal Component Analysis with Promax (orthogonal) rotation was conducted on the data from the sample of 222. The Kaiser-Meyer-Olkin sample of measuring adequacy value suggested that the sample was factorable (KMO = .89). It was previously reported that the WHOQOL had four factors (The WHOQOL Group, 1998). The analysis suggested a six-factor solution (see Table 15). Factor 1 (six items) accounts for 35.33% of the total variance of WHOQOL. Factor 2 (six items) accounts for 7.61% of the total variance. Factor 3 (four items) accounts for 6.37% of the total variance. Factor 4 (three items) accounts for 4.76% of the total variance. Factor 5 (three items) accounts for 4.36% of the total variance. Factor 6 (four items) accounts for 4.01% of the total variance. The pattern matrix of the WHOQOL items can be seen in the Appendices (see Appendix J).

Table 14

WHOQOL Measure of Sampling Adequacy

Kaiser-Meyer-Olkin Measure	.89			
Bartlett's Test of Sphericity	artlett's Test of Sphericity Approx. Chi-Square			
	df	325		
	Sig.	.00		

Table 15

	Initial Eigenvalues			Extraction Sums of Squared Loadings			
Component	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	
1	9.18	35.33	35.33	9.18	35.33	35.33	
2	1.98	7.61	42.95	1.98	7.61	42.95	
3	1.65	6.37	49.32	1.65	6.37	49.32	
4	1.23	4.76	54.09	1.23	4.76	54.09	
5	1.13	4.36	58.45	1.13	4.36	58.45	
6	1.04	4.01	62.47	1.04	4.01	62.47	
Note. Extraction Method: Principal Component Analysis.							

WHOQOL Factor Loadings

The following section presents the results and discussion of the research questions of this study.

Testing the Research Questions

Research question 1. Is there a relationship between depression and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students?

Multiple linear regression analysis was used to test the hypothesis that there is a relationship between the BDI-II and IAT, POGQ, and OGSAS. The result of the regression analyses indicated that the first model was statistically significant and explained 14% of the variance in depression, $R^2 = .14$, p < .05. It was found that IAT significantly predicted depression in the baseline model, $\beta = .374$, p < .05. Other R^2 changes were nonsignificant (see Table 16).

Table 16

Multiple Linear Regression Analyses in Predicting Depression from IAT, POGQ, and

OGSAS

			Change Statistics						
Model	R	\mathbb{R}^2	Adjusted R ²	Std. Error of the Estimate	R ² Change	F Change	df1	df2	Sig. F Change
1	.374ª	.140	.136	.463	.140	35.797	1	220	.000
2	.379 ^b	.144	.136	.463	.004	.936	1	219	.334
3	.380°	.144	.132	.464	.000	.110	1	218	.740
a. Predictors: (Constant), IAT									
b. Predictors: (Constant), IAT, POGQ									

c. Predictors: (Constant), IAT, POGQ, OGSAS

d. Dependent Variable: BDI-II

Table 17

Analyses of Variances of Multiple Linear Regression Analyses in Predicting Depression

from IAT, POGQ, and OGSAS

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.688	1	7.688	35.797	.000 ^b
	Residual	47.250	220	.215		
	Total	54.938	221			
2	Regression	7.889	2	3.945	18.361	.000 ^c
	Residual	47.049	219	.215		
	Total	54.938	221			
3	Regression	7.913	3	2.638	12.228	.000 ^d
	Residual	47.025	218	.216		
	Total	54.938	221			

a. Dependent Variable: BDI-II

b. Predictors: (Constant), IAT

c. Predictors: (Constant), IAT, POGQ

d. Predictors: (Constant), IAT, POGQ, OGSAS
Coefficients of Multiple Linear Regression Analyses in Predicting Depression from IAT,

		Unstar	ndardized	Standardized Coefficients		
Mode	el	B	Std. Error	Beta	t	Sig.
1	(Constant)	.073	.081		.906	.366
	IAT	.300	.050	.374	5.983	.000
2	(Constant)	.113	.091		1.245	.214
	IAT	.330	.059	.410	5.625	.000
	POGQ	053	.055	071	967	.334
3	(Constant)	.116	.091		1.269	.206
	IAT	.328	.059	.409	5.577	.000
	POGQ	057	.056	075	-1.010	.314
	OGSAS	.049	.149	.022	.332	.740
Note. Dependent Variable: BDI-II						

POGQ, and OGSAS

Table 19

Assumptions of Multiple Linear Regression Analyses in Predicting Depression from IAT,

POGQ, and OGSAS: Confidence Intervals and Multicollinearity Statistics

	95% Confiden Me	ce Interval for an	Collinearity Statistics		
	Lower Bound	Upper Bound	Tolerance	VIF	
IAT	1.40	1.56	.73	1.36	
POGQ	1.46	1.64	.70	1.41	
OGSAS	0.06	0.12	.93	1.07	
Note. Depende	ent Variable: BDI-I	[

There are four assumptions for multiple linear regression that are linear relationship, normal distribution, homoscedasticity, and no multicollinearity (Warner,

2013). Assumptions were tested in order to evaluate the criteria of multiple linear regression. The results showed that assumptions were met. The relationship between independent and dependent variables was linear. Using mahalanobis results and critical values, two outliers were identified in the data.

There was no multicollinearity. Tolerance values less than .2 cause concern of multicollinearity and with tolerance values less than .01 multicollinearity problem is certain (Menard, 1995). Tolerance values for IAT, POGQ and OGSAS were .73, .70, and .93, respectively. *VIF* of greater than 10 indicates that multicollinearity is present (Neter, Wasserman, & Kutner, 1989). *VIF* values for IAT, POGQ, and OGSAS were 1.36, 1.41, and 1.07 respectively. The 95% Confidence Intervals (*CI*) conducted for IAT (M = 1.48), POGQ (M = 1.55), and OGSAS (M = .09) included the population means.

Research question 2. Is there a relationship between quality of life and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students?

Multiple linear regression analysis was used to test the hypothesis that there is a relationship between WHOQOL and IAT, POGQ, and OGSAS. The results of regression analyses indicated that the baseline model was statistically significant and explained 20% of the variance in quality of life, $R^2 = .20$, p < .05. It was found that IAT significantly predicted quality of life in the baseline model, $\beta = -.449$, p < .05. The other R^2 changes were nonsignificant (see Table 20).

Multiple Linear Regression Analyses in Predicting Quality of Life from IAT, POGQ, and

OGSAS

					Change Statistics				
Model	R	\mathbb{R}^2	Adjusted R ²	Std. Error of the Estimate	R ² Change	F Change	df1	df2	Sig. F Change
1	.449 ^a	.201	.198	.513	.201	55.509	1	220	.000
2	.453 ^b	.205	.198	.512	.004	1.074	1	219	.301
3	.458°	.210	.199	.512	.005	1.303	1	218	.255
a. Predi	a. Predictors: (Constant), IAT								

b. Predictors: (Constant), IAT, POGQ

c. Predictors: (Constant), IAT, POGQ, OGSAS

d. Dependent Variable: WHOQOL

Table 21

Analyses of Variances of Multiple Linear Regression Analyses in Predicting Quality of

Life from IAT, POGQ, and OGSAS

Model		Sum of Squares	n of df Mean Sc lares		F	Sig.
1	Regression	14.611	1	14.611	55.509	.000 ^b
	Residual	57.908	220	.263		
	Total	72.519	221			
2	Regression	14.894	2	7.447	28.301	.000°
	Residual	57.625	219	.263		
	Total	72.519	221			
3	Regression	15.236	3	5.079	19.328	.000 ^d
	Residual	57.283	218	.263		
	Total	72.519	221			
a. Depe	ndent Variable:	WHOQOL				
b. Predi	ctors: (Constant	t), IAT				

c. Predictors: (Constant), IAT, POGQ

d. Predictors: (Constant), IAT, POGQ, OGSAS

Coefficients of Multiple Linear Regression Analyses in Predicting Quality of Life from

		Unstar	ndardized	Standardized Coefficients		
Mode	.1	B R	Std Error	Beta	t	Sig
wioue		D	Std. LIIU	Deta	ι	Sig.
1	(Constant)	4.387	.089		49.108	.000
	IAT	414	.056	449	-7.450	.000
2	(Constant)	4.340	.100		43.319	.000
	IAT	449	.065	486	-6.920	.000
	POGQ	.063	.061	.073	1.036	.301
3	(Constant)	4.329	.101		43.042	.000
	IAT	444	.065	481	-6.828	.000
	POGQ	.076	.062	.088	1.231	.220
	OGSAS	187	.164	071	-1.141	.255
Note. 1	Dependent Variabl	e: WHOOO	DL			

IAT, POGQ, and OGSAS

Table 23

Assumptions of Analyses of Variances of Multiple Linear Regression Analyses in Predicting Quality of Life from IAT, POGQ, and OGSAS: Confidence Intervals and Multicollinearity Statistics

	95% Confiden Me	ce Interval for ean	Collinearity Statistics		
	Lower Bound	Upper Bound	Tolerance	VIF	
IAT	1.40	1.56	.73	1.36	
POGQ	1.46	1.64	.70	1.41	
OGSAS	0.06	0.12	.93	1.07	
Note. Dependent Variable: WHOQOL					

Assumptions were tested in order to evaluate the criteria of multiple linear regression. The results showed that there was no multicollinearity. Tolerance values for IAT, POGQ and OGSAS were .73, .70, and .93, respectively. *VIF* values for IAT, POGQ, and OGSAS were 1.36, 1.41, and 1.07, respectively. The 95% *CIs* conducted for IAT (M = 1.48), POGQ (M = 1.55), and OGSAS (M = .09) included the population means.

Supplemental Analyses

Supplemental analyses were conducted in order to gather more information from the data and to learn if the groups differed in terms of gender and class because the literature lacks in regard to providing detailed information about students' Internet usage time, online behaviors, depression, and quality of life. Therefore, descriptive statistics and independent sample t-test scores are presented.

ANOVA analyses results in Table 24 showed that there was a statistically significant difference between freshmen and masters students' means in depression [F(5,216) = 2.97, p < .05]. Post hoc Tukey results also indicated that freshmen and masters students differ statistically significantly in depression with a mean difference of .46 (p < .05).

		Sum of Squares	df	Mean Square	F	Sig.
IAT	Between Groups	1.07	5	.21	.55	.73
	Within Groups	84.12	216	.38		
	Total	85.19	221			
POGQ	Between Groups	2.97	5	.59	1.37	.23
	Within Groups	93.21	216	.43		
	Total	96.18	221			
OGSAS	Between Groups	.11	5	.02	.48	.78
	Within Groups	10.38	216	.04		
	Total	10.49	221			
BDI-II	Between Groups	3.53	5	.70	2.97	.01
	Within Groups	51.40	216	.23		
	Total	54.93	221			
WHOQOL	Between Groups	.98	5	.19	.59	.70
	Within Groups	71.53	216	.33		
	Total	72.51	221			

One-Way Analyses of Variance of Study Variables

Means of undergraduate and graduate students (see Table 25) and independent sample ttest results (see Table 26) are presented. There were statistically significant differences in the following pairs: (a) POGQ levels between undergraduate (M = 1.62, SD = .68) and graduate students (M = 1.44, SD = .60), t (220) = 2.10, p = .03, and (b) BDI-II levels between undergraduate (M = .60, SD = .53) and graduate students (M = .38, SD = .40), t(220) = 3.42, p = .00. There were no statistically significant differences in the following pairs: (a) IAT levels between undergraduate (M = 1.49, SD = .59) and graduate students (M = 1.46, SD = .66), t (220) = .34, p = .73, (b) OGSAS levels between undergraduate (M = .09, SD = .23) and graduate students (M = .09, SD = .18), t (220) = .02, p = .98, and (c) WHOQOL levels between undergraduate (M = 3.73, SD = .60) and graduate students (M = 3.82, SD = .51), t (206) = -1.23, p = .22.

Table 25

	Class	n	М	SD	SE
IAT	Undergrad	134	1.49	.59	.05
	Grad	88	1.46	.66	.07
POGQ	Undergrad	134	1.62	.68	.05
	Grad	88	1.44	.60	.06
OGSAS	Undergrad	134	.09	.23	.02
	Grad	88	.09	.18	.01
BDI-II	Undergrad	134	.60	.53	.04
	Grad	88	.38	.40	.04
WHOQOL	Undergrad	134	3.73	.60	.05
	Grad	88	3.82	.51	.05

Descriptive Statistics of Study Variables by Class

		Levene's Test for Equality of Variances		t-test for	t-test for Equality of Means		
		F	Sig.	t	df	Sig.	
IAT	Equal variances assumed	1.85	.17	.34	220	.73	
	Equal variances not assumed			.33	172	.73	
POGQ	Equal variances assumed	3.93	.04	2.05	220	.04	
	Equal variances not assumed			2.10	201	.03	
OGSAS	Equal variances assumed	.00	.92	.02	220	.98	
	Equal variances not assumed			.02	213	.97	
BDI-II	Equal variances assumed	11.62	.00	3.24	220	.00	
	Equal variances not assumed			3.42	214	.00	
WHOQOL	Equal variances assumed	5.37	.02	-1.18	220	.23	
	Equal variances not assumed			-1.23	206	.22	
Note. Sig. 2-ta	ailed						

Independent Samples Test of Study Variables by Class

Means of male and female students (see Table 27) and independent sample t-test results (see Table 28) are presented. There were statistically significant differences in the following pairs: (a) POGQ levels between male (M = 1.88, SD = .70) and female students (M = 1.34, SD = .53), t (148) = 6.18, p = .00, (b) OGSAS levels between male (M = .13, SD = .25) and female students (M = .06, SD = .19), t (148) = 2.18, p = .03, and (c) BDI-II levels between male (M = .42, SD = .39) and female students (M = .57, SD = .54), t (217) = -2.35, p = .01. There were no statistically significant differences in the following pairs:

(a) IAT levels between male (M = 1.57, SD = .66) and female students (M = 1.42, SD = .58), t (220) = 1.83, p = .06, and (b) WHOQOL levels between male (M = 3.78, SD = .54) and female students (M = 3.76, SD = .59), t (220) = .34, p = .72.

Table 27

	Gender	n	М	SD	SE
IAT	Male	87	1.57	.66	.07
	Female	135	1.42	.58	.05
POGQ	Male	87	1.88	.70	.07
	Female	135	1.34	.53	.04
OGSAS	Male	87	.13	.25	.02
	Female	135	.06	.19	.01
BDI-II	Male	87	.42	.39	.04
	Female	135	.57	.54	.04
WHOQOL	Male	87	3.78	.54	.05
	Female	135	3.76	.59	.05

Descriptive Statistics of Study Variables by Gender

		Levene's Test for t-test for Equalit Equality of Variances		Equality of	ty of Means	
		F	Sig.	t	df	Sig.
IAT	Equal variances assumed	.04	.83	1.83	220	.06
	Equal variances not assumed			1.78	166	.07
POGQ	Equal variances assumed	11.11	.00	6.56	220	.00
	Equal variances not assumed			6.18	148	.00
OGSAS	Equal variances assumed	10.69	.00	2.31	220	.02
	Equal variances not assumed			2.18	148	.03
BDI-II	Equal variances assumed	9.31	.00	-2.19	220	.02
	Equal variances not assumed			-2.35	217	.01
WHOQOL	Equal variances assumed	1.36	.24	.34	220	.72
	Equal variances not assumed			.35	195	.72
Note. Sig. 2-ta	ailed					

Independent Samples Test of Study Variables by Gender

Weekly Internet usage statistics showed that 6.8% (n = 15, 4 males and 11 females) of the participants reported their weekly Internet usage as 1-10 hours, 29.7% (n = 66, 24 males and 42 females) reported as 11-20 hours, 27.4% (n = 61, 27 males and 34 females) reported as 21-30 hours, 18% (n = 40, 19 males and 21 females) reported as 31-40 hours, and 18% (n = 40, 13 males and 27 females) reported as 41 and more hours (see Table 29) which is shown in Figure 7 (see Appendix L). Weekly Internet usage

distribution by class is also shown in table 30 and presented in Figure 8 (see Appendix M).

Table 29

Week	ly	Internet	Usage	<i>Statistics</i>	by	Gend	er
	~				~		

	Time sj					
	1-10	11-20	21-30	31-40	41-over	Total
Males	4	24	27	19	13	87
Females	11	42	34	21	27	135
Total	15	66	61	40	40	222

Table 30

Weekly Internet Usage Statistics by Class

	Time sp					
-	1-10	11-20	21-30	31-40	41-over	Total
Freshmen	0	9	5	1	3	18
Sophomores	4	9	9	5	6	33
Juniors	2	8	13	7	3	33
Seniors	4	18	9	10	9	50
Masters	3	12	9	9	7	40
Ph.D.	2	10	16	8	12	48
Total	15	66	61	40	40	222

Figure 2 shows that there is a high number of people who do not participate in online gaming (n = 82). Therefore, supplemental analyses were conducted by only including those who participate in online gaming (n = 140). Compared to whole sample

descriptive statistics that were presented in Table 4, descriptive statistics of the gamer sample showed mean differences as seen below in Table 31.

Table 31

		Gamer Sam	ple	Whole Sample			
Variables	n	М	SD	n	М	SD	
IAT	140	1.63	.61	222	1.48	.62	
POGQ	140	1.88	.63	222	1.55	.65	
OGSAS	140	.12	.25	222	.09	.21	
BDI-II	140	.53	.47	222	.51	.49	
WHOQOL	140	3.74	.56	222	3.77	.57	

Supplemental Descriptive Statistics of Study Variables

Correlation statistics in Table 32 showed that the correlation between IAT and OGSAS became nonsignificant when only gamers were included (n = 140) as compared to the main analyses where the whole sample was used (n = 222). A supplemental histogram of POGQ with only gamers (n = 140) is included in the Appendices (see Appendix K).

		1	2	3	4	5
1	IAT	-				
	Sig (2-tailed)	-				
2	POGQ	$.50^{**}$	-			
	Sig (2-tailed)	.00				
3	OGSAS	.16	.17**	-		
	Sig (2-tailed)	.05	.04			
4	BDI	.37**	.20*	.11	-	
	Sig (2-tailed)	.00	.01	.19		
5	WHOQOL	44**	22**	- .17 [*]	77**	-
	Sig (2-tailed)	.00	.00	.03	.00	
No *p	te. This sample includes < .05 (2-tailed) **p < .0	only gamers, $n =$ 1 (2-tailed)	140.			

Supplemental Correlations of Study Variables

The whole sample one-way analyses of variance results in Table 24 showed that there was a statistically significant difference in depression levels (p < .05). However, one-way analyses of variance results did not show any significant results for online gamers. Moreover, the whole sample Post hoc Tukey results showed significant differences between freshmen and masters students in depression; however, the gamer sample Post hoc Tukey results showed nonsignificant results.

In order to compare the instruments' original factor analyses loadings to the current study factor analyses loadings, IAT, POGQ, and WHOQOL instruments were forced to have the same number of original factor numbers by using the Promax rotation method. Owing to BDI-II and OGSAS instruments having single factor loading in their validity study, these instruments were not included in this analysis. Current study factor loadings of IAT, POGQ, and WHOQOL instruments did not exactly match with the original factor loadings for IAT (Jelenchick et al., 2012), POGQ (Papay et al., 2013), and WHOQOL (The WHOQOL Group, 1998), but there were similarities (see Table 33). For example, current study IAT factor 1 loading included following items: 7, 8, 9, 10, 11, 12, 15, 16, 17, 18, 20. The original validity study of IAT presented factor 1 loading as 3, 4, 5, 9, 10, 11, 12, 13, 15, 18, 19, 20 (Jelenchick et al., 2012). As seen, the following items of factor 1 in the current study were the same in the original study that were 9, 10, 11, 12, 15, 18, and 20. The complete factor loadings of IAT, POGQ, and WHOQOL are presented in Table 33, Table 34, and Table 35 respectively.

IAT Factor Loadings								
CF1	OF1	CF2	OF2					
7	3	1	1					
8	4	2	2					
9	5	3	6					
10	9	4	7					
11	10	5	8					
12	11	6	14					
15	12	13	16					
16	13	14	17					
17	15	19						
18	18							
20	19							
	20							
Note. CF: Current Study Factor, OF: Original Study Factor								

Factor Analyses Comparison of IAT

Table 34

Factor Analyses Comparison of POGQ

POGQ Factor Loadings											
CF1	OF1	CF2	OF2	CF3	OF3	CF4	OF4	CF5	OF5	CF6	OF6
3	3	1	6	2	2	4	4	7	1	10	5
9	9	6	12	4	8	5	10	13	7	17	11
14	14	12	16	8	13	11	15				
18	18	16			17	15					
Note. CF: Current Study Factor, OF: Original Study Factor											

WHOQOL Factor Loadings										
CF1	OF1	CF2	OF2	CF3	OF3	CF4	OF4			
1	5	4	3	12	8	3	20			
2	6	7	4	13	9	15	21			
5	7	9	10	14	12	25	22			
6	11	10	15	20	13					
8	19	16	16	21	14					
11	26	17	17	22	23					
19		18	18	23	24					
26				24	25					
Note. CF: Current Study Factor, OF: Original Study Factor										

Factor Analyses Comparison of WHOQOL

Summary

In this chapter, preliminary analyses, descriptions of the sample, data screening procedures, and descriptive statistics of the study variables were presented. Results of the analyses for the statistical assumptions, research questions and their results, and supplementary analyses are discussed for the final sample.

Results of the first research question indicated that IAT statistically significantly predicted depression. Results of the second research question also indicated that IAT statistically significantly predicted quality of life. Supplemental analyses showed the similarities and differences between undergraduate and graduate levels, and male and female students on their IAT, POGQ, OGSAS, BDI-II, and WHOQOL levels. Weekly Internet usage statistics were also presented and showed the differences between undergraduate and graduate, and male and female students for the dependent variables. Discussion of the results section are presented in the following chapter.

Limitations, implications, and further research suggestions are discussed.

Chapter 5: Discussion

Introduction

This chapter summarizes the purpose of the study, the results of the analyses, and discusses the implications for theory and practice. Additionally, limitations of the study are discussed and suggestions for further research are presented.

Summary of the Study

This study explored problematic Internet use, online gaming, and online gambling and their relationships with depression and quality of life among college students. Undergraduate and graduate students of a public university in the Midwest were used as the sample of this study. Participants completed a web-survey sent to students enrolled in the Summer semester of 2016. The data used in the analyses were from the final sample of 222 valid surveys.

This study aimed to answer one descriptive question and two research questions. The study findings are presented below. Findings will help with understanding the relationship between dysfunctional online behaviors and depression and quality of life among college students.

Preliminary Analyses

Before conducting main analyses for the descriptive question and research questions, preliminary analyses were conducted to examine the reliability of instruments. The instruments showed a high level of reliability in the present study. Cronbach's alpha reliability coefficient for IAT is $\alpha = .90$ in the present study. In the literature, IAT Cronbach's alpha reliability coefficient was $\alpha = .91$ in the US validation study (Jelenchick et al., 2012). The present study's Cronbach's alpha reliability coefficient for POGQ is $\alpha = .95$. POGQ Cronbach's alpha reliability coefficient was $\alpha = .91$ in the validation study of the instrument (Papay et al., 2013). OGSAS Cronbach's alpha reliability coefficient is $\alpha = .73$ in the current study. Test developers reported that G-SAS Cronbach's alpha reliability coefficient was $\alpha = .86$ (Kim et al., 2009). BDI-II Cronbach's alpha reliability coefficient is found as $\alpha = .92$ in the present study. BDI-II Cronbach's alpha reliability coefficient was $\alpha = .92$ (Pearson Clinical, n.d., para 5). The results of this study show Cronbach's alpha reliability coefficient for WHOQOL as $\alpha =$.92. The Cronbach's alpha reliability for the entire WHOQOL instrument was $\alpha = .91$ in a New Zealand sample (Krageloh et al., 2013), $\alpha = .84$ in one Brazilian sample (Berlim et al., 2005), and $\alpha = .83$ in another Brazilian sample (Castro et al., 2014). Results show that the current study reliability scores are similar to original reliability scores of the instruments.

In order to understand the relationships between the pairs of the study variables, correlation analyses were conducted. The following pairs of variables were significantly correlated: IAT and POGQ (r = .51, p < .01), IAT and OGSAS (r = .18, p < .01), IAT and BDI-II (r = .37, p < .01), IAT and WHOQOL (r = ..44, p < .01), POGQ and OGSAS (r = .25, p < .01), POGQ and BDI-II (r = .14, p < .05), POGQ and WHOQOL (r = ..17, p < .01), OGSAS and WHOQOL (r = ..13, p < .05), and BDI-II and WHOOQL (r = ..74, p < .01). There was only one nonsignificant pair, OGSAS and BDI-II (r = .07, p > .05). Although the literature is limited, it shows a relationship between gambling and depression (Dufour, Brunelle, & Roy, 2015; Quigley et al., 2015; Rizeanu, 2013).

However, the present study results show a nonsignificant correlation between gambling and depression, which could be the result of low scores on the gambling instrument, OGSAS.

Findings

In this study, one descriptive question and two research questions were addressed. The purpose of the descriptive question was to explore the prevalence of problematic Internet use among college students.

Descriptive question. What is the prevalence of problematic Internet use among college students?

Descriptive statistics were used to examine this question. This is important to look at because literature states that there might be a link between overuse of the Internet and mental health problems (Young et al., 2011). This relationship might also have an effect on quality of life.

According to the results of the descriptive statistics, within the past six months, 6.8% of the sample (n = 15) indicated that they spent 1-10 hours per week online, 29.7% (n = 66) spent 11-20 hours per week online, 27.5% (n = 61) spent 21-30 hours per week online, 18% (n = 40) spent 31-40 hours per week online, and 18% (n = 40) spent 40 or more hours per week online.

Researchers define the overuse of the Internet as going online for more than 20 hours a week (Ko et al., 2007) and using the Internet more than two hours a day every day (Cassidy-Bushrow et al., 2015). Descriptive statistics showed that 63.5% of the sample's weekly Internet usage was over 20 hours. Pontes, Szabo, and Griffiths (2015)

reported that their study sample's leisure Internet usage was 28 hours per week. Although literature states that more than 20 hours a week of Internet usage is considered as overuse, there is no distinct line between educational, professional, and leisure usage. For example, information gathering or educational use is considered moderate use; however, Internet usage with no purpose or gaming or gambling is considered as heavy use (Romer et al., 2013). However, it is hard to draw the line between educational or professional, and leisure usage because existing instruments do not measure how time is allocated for leisure versus educational or professional purposes. This issue will be discussed further in the limitations section.

The other purpose of the present study was to examine two research questions.

Research question 1. Is there a relationship between depression and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students?

Multiple linear regression analysis was used to examine the first research question. As presented in chapter four, the result of the regression analyses indicated that the first model was statistically significant and explained 14% of the variance, $R^2 = .14$, p< .05. It was found that IAT significantly predicted depression in the baseline model, $\beta =$.374, p < .05. Other R^2 changes were nonsignificant. Preliminary analyses also showed that IAT and BDI-II were correlated significantly (r = .37, p < .01). Therefore, this relationship was expected. The literature states that overuse of the Internet might affect psychological wellbeing (Bell, 2007; Green et al., 2005; Kraut et al., 1998). College students might use the Internet excessively due to unlimited Internet access on campus. Therefore, their usage time could go over longer than intended which might affect them negatively by leading to low psychological well-being (Chen, 2012). Another study shows similar results that problematic Internet use is related to depression, loneliness, and low self-esteem (van der Aa et al., 2009). Moreover, overuse of the Internet is related to loneliness and anxiety (Clifton et al., 2013) and depression (Ceyhan & Ceyhan, 2008). The results of the analyses for the first research question support the existing literature. It is hard to say what causes what in terms of the variables of this study because of the non-experimental design of the present study. However, it is obvious that a relationship between the problematic Internet use and depression exists.

Research question 2. Is there a relationship between quality of life and linear combination of the Internet Addiction Test (IAT), the Problematic Online Gaming Questionnaire (POGQ), and the Online Gambling Symptom Assessment Scale (OGSAS) among college students?

Multiple linear regression analysis was used to examine the second research question. As presented in chapter four, the results of regression analyses indicated that the baseline model was statistically significant and explained 20% of the variance in quality of life, $R^2 = .20$, p < .05. It was found that IAT significantly predicted quality of life in the baseline model, $\beta = -.449$, p < .05. Other R^2 changes were nonsignificant.

Preliminary analyses also showed that IAT and WHOQOL were correlated significantly (r = -.44, p < .01).

The literature states that some of the negative outcomes of overuse of the Internet is related to quality of life including neglecting responsibilities and disrupting relationships (Young, 1998b), insomnia, craving, and loneliness (Young et al., 2011), avoiding daily life activities (Caplan et al., 2009), and social isolation (Clifton et al., 2013; Davis, 2001). Although the present study cannot assume a causal relationship due to the non-experimental design of the study, the present study results support existing literature. As a result of problematic Internet use, users' quality of life might be affected negatively because excessive Internet use decreases users' social interaction, face-to-face communication, and time spent with friends and family. Moreover, dependent use of the Internet might cause neglecting responsibilities both in school and at home. Further research is needed in order to find the causal relationship between problematic Internet use and quality of life.

Supplemental Analyses

Owing to significant results of the descriptive and research questions, supplemental analyses were conducted to gain more information from the data and to compare depression levels and Internet usage levels between gender and class. Another purpose of conducting supplemental analyses was to compare the results of Internet usage levels with the existing literature because existing instruments do not measure usage time. The last purpose of the supplemental analyses is to provide additional support for the trend found in the literature that depression levels decrease throughout the academic years (Chen & Lin, 2016; Rawana & Morgan, 2014).

As reported in chapter four, results of ANOVA analyses showed that freshmen and masters students differ significantly in depression levels. Post hoc Tukey results also indicated a similar result that there is a difference between freshmen and master students' depression levels. The present study results showed that freshmen students are higher in depression than upper classmen. The results of the present study corroborate the previous literature findings in this regard. Literature results show decreases in depression levels from the first to the fifth semester of college (Chen & Lin, 2016), among young adults from age of 17 to 21 (Rawana & Morgan, 2014). This might be an indication of a difficult transition from high school, adjustment to college and a new social environment at first because students' depression levels decrease gradually throughout college years in the present study and existing literature (Chen & Lin, 2016; Rawana & Morgan, 2014).

The literature presents different arguments regarding the Internet usage time between males and females. For example, one study reports that overall Internet use of males is 31.62 hours per week compared to females as 26.61 hours per week (Widyanto & McMurran, 2004). However, another study reports that there was no significant difference between gender concerning Internet usage time (Chang, Yeh, Chen, & Lin, 2013). The present study results show gender differences in Internet usage time. Crosstabs results show that (a) more females spend between 1-20 hours online compared to males, (b) more males spend between 21-40 hours online compared to females, and (c) more females spend over 40 hours online compared to males (see Appendix L). Independent sample t-test scores show significant differences between the following pairs in regard to class and gender: (a) POGQ levels between undergraduate and graduate students where undergraduates report higher POGQ levels, (b) POGQ levels between male and female students where males report higher POGQ levels, (c) BDI-II levels between undergraduate and graduate students where undergraduates report higher BDI-II levels, (d) BDI-II levels between male and female students where females report higher BDI-II levels, and (e) OGSAS levels between male and female students where males report higher OGSAS levels.

Independent sample t-test scores also show nonsignificant results between the following pairs in regard to class and gender: (a) IAT levels between undergraduate and graduate students, (b) IAT levels between male and female students, (c) OGSAS levels between undergraduate and graduate students, (d) WHOQOL levels between undergraduate and female students, and (e) WHOQOL levels between male and female students.

Supplemental analyses concerning gender and class comparisons were needed because as mentioned in chapter 4, the existing literature does not provide detailed and comparative information of these variables. Therefore, the results of the present study not only contribute to the literature, but also provide general information for future research.

Additionally, supplemental analyses with only gamers were presented in Table 31 and Table 32. Current study factor loadings of IAT, POGQ, and WHOQOL compared to original factor loadings were presented in Table 33, Table 34, and Table 35 respectively.

Current study factor loadings were not the same with original factor loadings, but they were somewhat similar. This will be discussed in the limitations section.

The following section provides theoretical and practical implications. Implications for practice will help professionals apply appropriate practical modalities when treating dysfunctional online behavioral issues.

Theoretical Implications

The current study findings support the theoretical background in regard to a positive correlation between problematic Internet use and depression (Bell, 2007; Ceyhan & Ceyhan, 2008; Chen, 2012), and a negative correlation between problematic Internet use and quality of life (Caplan et al., 2009; Davis, 2001; Young et al., 2011). The present study findings indicate significant correlations between the following pairs: (a) problematic Internet use and online gaming (b) problematic Internet use and online gambling, (c) problematic Internet use and depression, (d) problematic Internet use and quality of life, (e) online gaming and online gambling, (f) online gaming and depression, (g) online gaming and quality of life. It is obvious from the literature and the current study findings that problematic Internet has relationships with depression and quality of life among college students. However, more research needs to be done in order to identify if there is any causal relationship between problematic Internet use and depression, and problematic Internet use and quality of life.

Findings of this study raise a question regarding what other variables might be related to depression and quality of life aside from problematic Internet use among college students. Since the findings of the current study show significant differences in depression levels between undergraduate and graduate students, and depression levels decrease throughout the college years, adjustment could be another variable that might be related to depression. This will be further discussed in the recommendations section.

Moreover, as mentioned in chapter 4, the literature states two different arguments in regard to gender differences in Internet usage time as some report differences in gender as opposed to some report no difference in gender. The current study findings contribute to the literature by showing that male and female college students differ in their Internet usage time.

Finally, the existing instrument for measuring the problematic Internet use do not measure Internet usage time. This is an issue because the literature states that more than 20 hours of Internet usage per week might be problematic (Ko et al., 2007). However, there is currently not an ability to discern the amount of time spent on professional versus leisure activities. The current study findings show that 63.5% of the college student sample used Internet more than 20 hours a week. This may or may not be an indicator of problematic Internet use without taking other variables into consideration, such as how much of the time spent on the Internet is used for professional/educational and leisure purposes. Further research needs to be conducted in order to differentiate professional/educational Internet usage time and leisure Internet usage time, and to identify other factors beyond time that contribute to Internet usage becoming problematic. Owing to deficiency of the definition of the problematic Internet use, a new definition is needed. Therefore, an expanded definition of problematic Internet is proposed which includes using the Internet for more than 20 hours a week with no clear professional or leisure purpose in a manner that interferes with user's ability to engage in daily life activities and fulfill responsibilities.

Implication for Practitioners

Owing to significant study results, existing literature, and amount of Internet usage among college students, college counseling centers need to pay close attention to the effects of dysfunctional online behaviors, whether it is problematic Internet use, online gaming, online gambling or social network use. Screening instruments cannot diagnose problematic Internet use because it is not included in DSM-5 (APA, 2013). However, college counseling centers may use existing instruments to identify issues. Since the existing instruments do not measure Internet usage time, it will be beneficial to collect descriptive data, such as professional/educational and leisure usage time.

Another question raised after identifying problematic online behaviors is what treatment modality should be used. Although the literature does not suggest a specific treatment modality in order to treat problematic Internet use (Abreu & Goes, 2011, p. 155), CBT is suggested by Young (2011a) as a treatment modality for problematic online behaviors. Since the existing instruments do not measure Internet usage time, Young suggests a daily Internet use log in order to assess Internet usage time. Young also focuses on underlying issues in order to prevent relapse after termination of the client. Therefore, the current study also recommends CBT as a treatment modality for problematic online behaviors.

Limitations of the study and recommendations for further research are presented in the next sections that will help future research and the advancement of the counseling profession.

Limitations of the Study

The current study contributes to the literature in many ways; however, there are several limitations of this study. Although, the sample of the current study is more than what is needed for the statistical analyses, more participants could be obtained if data were collected in the Fall or Spring semester as opposed to the Summer semester. Moreover, the collection of data in the Summer could also have an effect on the results because students who are enrolled in the Summer might be qualitatively different from those enrolled in the Fall/Spring semesters in some meaningful ways. For example, students who are enrolled in Summer might be more motivated and engaged with their academic lives, and taking courses in order to fulfill their academic requirements earlier than expected. In addition, students are mostly enrolled as part-time with a lesser course load during the Summer semester which might also have an effect on the results because they might be less stressed than those who are enrolled full-time in Fall or Spring semester.

The descriptive statistics show that the response rate of the participants recruited for the current study was 5% with the population sample of 7,056. Although the present study findings show significant results, low response rate might affect generalizability of the results because people who participated might be qualitatively different from those who did not participate.

Since 1998, IAT has measured problematic online behaviors in general, but has not asked specific questions regarding users' professional/educational or leisure use. Moreover, IAT does not have subscales which measure users' professional/educational or leisure usage time. Therefore, it is hard to identify users' problematic Internet usage without specifying how much time on the Internet is for leisure as compared to professional or educational purposes. Hence, future research is needed in order to modify the IAT by taking these issues into consideration. Moreover, there was a significant correlation between IAT and POGQ, but POGQ did not explain much when it was added to the regression model. IAT measures problematic online behaviors in general. Therefore, IAT items could be measuring online gaming or online gambling covertly. This might be the reason why POGQ did not explain much in the regression model.

Another possible limitation of the study surrounds honesty with respect to OGSAS. Specifically, the OGSAS instrument items might cause discomfort to answer due to the illegality of online gambling. Therefore, participants' discomfort might affect the honesty of their responses. Also, there is no specific instrument which measures only online gambling. In order to assess online gambling, modification to the G-SAS were made. Therefore, modification and psychometric analyses of the modified instrument are needed.

Recommendations for Further Research

The current study offers some recommendations based on the study results. First, the current study aimed to explore the prevalence of problematic Internet use among college students. Two research questions examined the relationships between (a) problematic Internet use, online gaming, and online gambling and depression, and (b) problematic Internet use, online gaming, and online gambling and quality of life. The study used a non-experimental research design. Thus, risk factors and harm to human subjects are minimized. However, due to the non-experimental research design and selfreport data collection, uncontrollable factors, such as unexpected personal or educational issues, might affect participants' responses. Therefore, it would be helpful to examine possible factors that could have an effect on college students. Furthermore, the current study results showed that freshmen students have higher levels of depression than upper classmen. A possible reason could be an adjustment issue from high school to college (Ybarra et al., 2005). Further examination is needed in order to identify other possible factors that could influence depression and quality of life among college students. Moreover, the relationship between adjustment and depression could be studied longitudinally in future research because a longitudinal study would be beneficial to explore effects of other possible factors on depression and quality of life throughout the college.

The main analyses of the study showed nonsignificant relationships between: (a) online gaming and online gambling, and depression, and (b) online gaming and online gambling, and quality of life. Biased answers could be given by the participants due to

limitations of the instruments and illegality of online gambling. Therefore, modifications of the instruments need to be done. Also, future research needs to be conducted in regard to assuring participants of ensured anonymity of the participation.

Since IAT measures problematic online behaviors in general, further investigation into online gaming and online gambling is recommended without using IAT. This will give researchers an opportunity to study the influence of IAT on other online behavior instruments that measure specific online behaviors. Moreover, the current study factor analysis loadings showed somewhat similar results with original factor loadings. Further investigations with college samples are recommended in order to compare results if there is any factor loading difference between college samples and general samples because different demographics might influence factor loadings.

Gender differences were found in online gaming, depression, and online gambling levels. Class differences were found in regard to online gaming and depression levels. Also, Internet usage times differed between males and females. These findings of the current study were important to fill the gap in the literature due to insufficient knowledge in this area. Further investigation is needed in order to fill the gap in the literature and to identify any additional online behavior similarities or differences between different groups.

Conclusions

This study aimed to investigate the prevalence of Internet use and the relationships between problematic online behaviors (problematic Internet use, online gaming, and online gambling) and depression and quality of life among college students.

It was found that problematic Internet use predicted depression and quality of life among college students. Problematic Internet use was positively correlated with depression and negatively correlated with quality of life.

Although online gaming was significantly correlated with depression and quality of life, it did not predict depression and quality of life among college students. Online gambling was also correlated with quality of life, but it did not predict quality of life among college students.

The Internet usage time differed among male and female participants. Results contribute to the literature because there is an argument in regard to Internet usage time difference among males and females.

The findings of the current study not only contribute to the literature, but also present significant results to practitioners who work with college populations. Moreover, the current study offers recommended treatment modalities for problematic online behaviors.

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Appendix A: Demographic Questionnaire

Demographic Questionnaire

Please take a few moments to answer following questions.

- 1. What is your age?
 - ... years
- 2. What is your gender?
 - ... Male
 - ... Female
 - ... Transgender
 - ... Other (please specify)
- 3. To which race/ethnicity do you most identify yourself?
 - ... White or Caucasian
 - ... African American
 - ... American Indian or Alaska Native
 - ... Hispanic, Latino, or Spanish origin
 - ... Asian American
 - ... Other (Please specify)
- 4. What is your classification by 2015-2016 school year enrolled at Ohio

University?

- ... Undergraduate
 - a) Freshman
 - b) Sophomore

- c) Junior
- d) Senior
- ... Graduate
 - a) Masters
 - b) Ph.D.
- 5. What is your student status?
 - a) full-time
 - b) part-time
- 6. What is your current GPA?

•••

- 7. What is your residential status?
 - ... On-campus resident
 - ... Off-campus resident
- 8. Do you participate in extracurricular activities and clubs at school?
 - ... Yes

If yes, please provide which extracurricular activities or clubs you participate in

... No

- 9. Are you currently employed?
 - ... Yes

... No

10. Within the past 6 months, how much time do you spend going online, per week?

- a) 1-10
- b) 11-20
- c) 21-30
- d) 31-40
- e) 41-over
- 11. What technology tools do you use most? Please rank as 1 is the most and 4 is the

least

- ... mobile phone
- ... tablet
- ... desktop
- ... laptop

Appendix B: Internet Addiction Test (IAT)

Internet Addiction Test (Young, 1998b)

This questionnaire consists of 20 questions. Please read each question carefully and then pick out the one statement in each question that best describes you. Answer the following questions using this scale and circle the number that best represents you during the past month:

0 = Not Applicable

1 = Rarely

- 2 = Occasionally
- 3 = Frequently
- 4 = Often
- 5 = Always
- 1. How often do you find that you stay online longer than you intended?
 - 0 1 2 3 4 5
- 2. How often do you neglect household chores to spend more time online?
 - 0 1 2 3 4 5

3. How often do you prefer the excitement of the Internet to intimacy with your partner?

- 0 1 2 3 4 5
- 4. How often do you form new relationships with fellow online users?
 - 0 1 2 3 4 5

- 5. How often do others in your life complain to you about the amount of time you spend online?
 - 0 1 2 3 4 5
- 6. How often do your grades or school work suffer because of the amount of time you spend online?
 - 0 1 2 3 4 5
- 7. How often do you check your e-mail before something else that you need to do?
 - 0 1 2 3 4 5
- 8. How often does your job performance or productivity suffer because of the Internet?
 - 0 1 2 3 4 5
- 9. How often do you become defensive or secretive when anyone asks you what you do online?
 - 0 1 2 3 4 5
- 10. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?
 - 0 1 2 3 4 5
- 11. How often do you find yourself anticipating when you will go online again?
 - 0 1 2 3 4 5
- 12. How often do you fear that life without the Internet would be boring, empty, and joyless?
 - 0 1 2 3 4 5

- 13. How often do you snap, yell, or act annoyed if someone bothers you while you are online?
- 01234514.How often do you lose sleep due to late-night log-ins?
 - 0 1 2 3 4 5
- 15. How often do you feel preoccupied with the Internet when off-line, or fantasize about being online?
 - 0 1 2 3 4 5
- 16. How often do you find yourself saying "just a few more minutes" when online?
 - 0 1 2 3 4 5
- 17. How often do you try to cut down the amount of time you spend online and fail?
 - 0 1 2 3 4 5
- 18. How often do you try to hide how long you've been online?
 - 0 1 2 3 4 5
- 19. How often do you choose to spend more time online over going out with others?
 - 0 1 2 3 4 5

20. How often do you feel depressed, moody, or nervous when you are off-line, which goes away once you are back online?

0 1 2 3 4 5

Appendix C: Problematic Online Gaming Questionnaire (POGQ) Problematic Online Gaming Questionnaire (POGQ)

The following questionnaire consists of 18 items. Please read each question carefully and then pick out the one statement, to what extent, and how often, these statements apply to you! Answer the following questions using this scale and circle the number.

- 1 = Never
- 2 =Seldom
- 3 = Occasionally
- 4 = Often
- 5 = Always
- 1. When you are not gaming, how often do you think about playing a game or think about how would it feel to play at that moment?
 - 1 2 3 4 5
- 2. How often do you play longer than originally planned?
 - 1 2 3 4 5
- 3. How often do you feel depressed or irritable when not gaming only for these feelings to disappear when you start playing?
 - 1 2 3 4 5
- 4. How often do you feel that you should reduce the amount of time you spend gaming?
 - 1 2 3 4 5

5.	How often do the people around you complain that you are gaming too much?								
	1	2	3	4	5				
6.	How often do you fail to meet up with a friend because you were gaming?								
	1	2	3	4	5				
7.	How often do you daydream about gaming?								
	1	2	3	4	5				
8.	How often do you lose track of time when gaming?								
	1	2	3	4	5				
9.	How often do you get irritable, restless or anxious when you cannot play gam								
	much as you want?								
	1	2	3	4	5				
10.	How often do you unsuccessfully try to reduce the time you spend on gaming?								
	1	2	3	4	5				
11.	How o	How often do you argue with your parents and/or your partner because of							
	gaming?								
	1	2	3	4	5				
12.	How often do you neglect other activities because you would rather game?								
	1	2	3	4	5				
13.	How often do you feel time stops while gaming?								
	1	2	3	4	5				
14.	How often do you get restless or irritable if you are unable to play games for a								
	few da	ew days?							

1 2 3 4 5

15.	How often do you feel that gaming causes problems for you in your life?							
	1	2	3	4	5			
16.	How often do you choose gaming over going out with someone?							
	1	2	3	4	5			
17.	How often are you so immersed in gaming that you forget to eat?							
	1	2	3	4	5			
18.	e or upset when you cannot play?							
	1	2	3	4	5			

Appendix D: Online Gambling Symptom Assessment Scale (OGSAS)

Online Gambling Symptom Assessment Scale (OGSAS)

The following questionnaire consists of 12 items. Please read each question carefully and then pick out the one statement.

- If you had unwanted urges to gamble online during the past WEEK, on average, how strong were your urges?
 - 0-None
 - 1 Mild
 - 2 Moderate
 - 3 Severe
 - 4-Extreme
- 2. During the past WEEK, how many times did you experience urges to gamble online?
 - 0-None
 - 1 Once
 - 2 Two to three times
 - 3 Several to many times
 - $4-Constant \ or \ near \ constant$
- 3. During the past WEEK, how many hours (add up hours) were you preoccupied with your urges to gamble online?
 - 0 None
 - 1 1 hour or less

- 2 1-7 hours
- 3 7-21 hours
- 4 Over 21 hours
- 4. During the past WEEK, how much were you able to control your urges?
 - 0-Complete
 - 1-Much
 - 2-Moderate
 - 3 Minimal
 - 4 No control
- 5. During the past WEEK, how often did thoughts about gambling online and

placing bets come up?

- 0-None
- 1 Once
- 2 Two or four times
- 3 Several to many times
- 4 Constantly or near constantly
- 6. During the past WEEK, approximately how many hours (add up hours) did you spend thinking about gambling online and thinking about placing bets?
 - 0 None
 - 1-1 hour or less
 - 2-1 to 7 hours
 - 3-7 to 21 hours

 $4 - Over \ 21 \ hours$

- 7. During the past WEEK, how much were you able to control your thoughts of gambling online?
 - 0 Complete
 - 1 Much
 - 2-Moderate
 - 3-Minimal
 - 4-None
- 8. During the past WEEK, approximately how much total time did you spend gambling online or on online gambling related activities?
 - 0-None
 - 1-2 hours or less
 - 2-2 to 7 hours
 - 3-7 to 21 hours
 - 4 Over 21 hours
- 9. During the past WEEK, on average, how much anticipatory tension and/or excitement did you have *shortly before* you engaged in online gambling? If you did not actually gamble online, please estimate how much tension and/or excitement you believe you would have experienced if you had gambled online.
 - 0-None
 - 1 Minimal
 - 2 Moderate
3-Much

4-Extreme

- 10. During the past WEEK, on average, how much excitement and pleasure did you feel when you won on your bet. If you did not actually win at online gambling, please estimate how much excitement and pleasure you would have experienced if you had won.
 - 0 None
 - 1 Minimal
 - 2-Moderate
 - 3 Much
 - 4-Extreme
- 11. During the past WEEK, how much emotional distress (mental pain or anguish, shame, guilt, embarrassment) has your online gambling caused you?
 - 0-None
 - 1 Mild
 - 2-Moderate
 - 3-Severe
 - 4-Extreme
- 12. During the past WEEK, how much personal trouble (relationship, financial, legal, job, medical or health) has your online gambling caused you?
 - 0-None
 - 1 Mild

- 2-Moderate
- 3 Severe
- 4 Extreme

Appendix E: WHOQOL-BREF

WHOQOL-BREF

The following questionnaire consists of 26 items. Please read each question carefully, assess your feelings, and then pick out the one statement that gives the best answer for you for each question.

- 1. How would you rate your quality of life?
 - 1 Very poor
 - 2 Poor
 - 3 Neither poor nor good
 - 4-Good
 - $5 Very \ Good$
- 2. How satisfied are you with your health?
 - 1 Very dissatisfied
 - 2-Dissatisfied
 - 3- Neither satisfied nor dissatisfied
 - 4-Satisfied
 - 5 Very satisfied

The following questions ask about how much you have experienced certain things in the last two weeks.

- 3. To what extent do you feel that physical pain prevents you from doing what you need to do?
 - 1 Not at all

- 2 A little
- 3 A moderate amount
- 4-Very much
- 5 An extreme amount
- 4. How much do you need any medical treatment to function in your daily life?
 - 1 Not at all
 - 2 A little
 - 3 A moderate amount
 - 4 Very much
 - 5 An extreme amount
- 5. How much do you enjoy life?
 - 1 Not at all
 - 2 A little
 - 3 A moderate amount
 - 4 Very much
 - 5 An extreme amount
- 6. To what extent do you feel your life to be meaningful?
 - 1 Not at all
 - 2 A little
 - 3 A moderate amount
 - 4 Very much
 - 5 An extreme amount

- 7. How well are you able to concentrate?
 - 1 Not at all
 - 2 Slightly
 - 3-A Moderate amount
 - 4 Very much
 - 5 Extremely
- 8. How safe do you feel in your daily life?
 - 1 Not at all
 - 2-Slightly
 - 3 A Moderate amount
 - 4 Very much
 - 5 Extremely
- 9. How healthy is your physical environment?
 - 1 Not at all
 - 2-Slightly
 - 3 A Moderate amount
 - 4 Very much
 - 5 Extremely

The following questions ask about how completely you experience or were able to do certain things in the last two weeks.

- 10. Do you have enough energy for everyday life?
 - 1 Not at all

- 2 A little
- 3 Moderately
- 4-Mostly
- 5 Completely
- 11. Are you able to accept your bodily appearance?
 - 1 Not at all
 - 2 A little
 - 3 Moderately
 - 4 Mostly
 - 5 Completely
- 12. Have you enough money to meet your needs?
 - 1 Not at all
 - 2 A little
 - 3 Moderately
 - 4 Mostly
 - 5 Completely
- 13. How available to you is the information that you need in your day-to-day life?
 - 1 Not at all
 - 2 A little
 - 3 Moderately
 - 4 Mostly
 - 5 Completely

- 14. To what extent do you have the opportunity for leisure activities?
 - 1 Not at all
 - 2 A little
 - 3 Moderately
 - 4 Mostly
 - 5 Completely
- 15. How well are you able to get around?
 - 1-Very poor
 - 2-Poor
 - 3 Neither poor nor well
 - 4-Well
 - 5 Very well

The following questions ask you to say how good or satisfied you have felt about various aspects of your life over the last two weeks.

- 16. How satisfied are you with your sleep?
 - 1 Very dissatisfied
 - 2-Dissatisfied
 - 3 Neither satisfied nor dissatisfied
 - 4-Satisfied
 - 5 Very satisfied
- 17. How satisfied are you with your ability to perform your daily living activities?
 - 1 Very dissatisfied

- 2-Dissatisfied
- 3 Neither satisfied nor dissatisfied
- 4-Satisfied
- 5 Very satisfied
- 18. How satisfied are you with your capacity for work?
 - 1 Very dissatisfied
 - 2-Dissatisfied
 - 3 Neither satisfied nor dissatisfied
 - 4-Satisfied
 - 5 Very satisfied
- 19. How satisfied are you with yourself?
 - 1 Very dissatisfied
 - 2 Dissatisfied
 - 3 Neither satisfied nor dissatisfied
 - 4-Satisfied
 - 5 Very satisfied
- 20. How satisfied are you with your personal relationships?
 - 1 Very dissatisfied
 - 2-Dissatisfied
 - 3- Neither satisfied nor dissatisfied
 - 4-Satisfied
 - 5 Very satisfied

- 21. How satisfied are you with your sex life?
 - 1 Very dissatisfied
 - 2-Dissatisfied
 - 3 Neither satisfied nor dissatisfied
 - 4-Satisfied
 - 5 Very satisfied
- 22. How satisfied are you with the support you get from your friends?
 - 1 Very dissatisfied
 - 2-Dissatisfied
 - 3 Neither satisfied nor dissatisfied
 - 4-Satisfied
 - 5 Very satisfied
- 23. How satisfied are you with the conditions of your living place?
 - 1 Very dissatisfied
 - 2-Dissatisfied
 - 3 Neither satisfied nor dissatisfied
 - 4-Satisfied
 - 5 Very satisfied
- 24. How satisfied are you with your access to health services?
 - 1 Very dissatisfied
 - 2-Dissatisfied
 - 3 Neither satisfied nor dissatisfied

- 4-Satisfied
- 5 Very satisfied
- 25. How satisfied are you with your mode of transportation?
 - 1 Very dissatisfied
 - 2-Dissatisfied
 - 3 Neither satisfied nor dissatisfied
 - 4-Satisfied
 - 5 Very satisfied

The following question refers to how often you have felt or experienced certain things in the last two weeks.

26. How often do you have negative feelings, such as blue mood, despair, anxiety,

depression?

- 1 Never
- 2-Seldom
- 3 Quite often
- 4 Very often
- 5 Always

IAT Pattern Matrix

	Component			
-	1	2	3	4
9. How often do you become defensive or secretive when anyone asks you what you do online?	.965		113	170
11. How often do you find yourself anticipating when you will go online again?	.796			
18. How often do you try to hide how long you've been online?	.720			
8. How often does your job performance or productivity suffer because of the Internet?	.666	299	.225	
10. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?	.633		.147	116
20. How often do you feel depressed, moody, or nervous when you are off-line, which goes away once you are back online?	.590	.167	238	.293
6. How often do your grades or school work suffer because of the amount of time you spend online?	.556	.201	.228	252
17. How often do you try to cut down the amount of time you spend online and fail?	.506	309	.414	.203
15. How often do you feel preoccupied with the Internet when off-line, or fantasize about being online?	.416	.340		.174
4. How often do you form new relationships with fellow online users?	173	.745		
3. How often do you prefer the excitement of the Internet to intimacy with your partner?	215	.735	.133	
13. How often do you snap, yell, or act annoyed if someone bothers you while you are online?	.107	.666		
5. How often do others in your life complain to you about the amount of time you spend online?	.314	.458	.184	207
14. How often do you lose sleep due to late- night log-ins?	.218	.419	.232	
2. How often do you neglect household chores to spend more time online?	111	.169	.859	
1. How often do you find that you stay online longer than you intended?		.106	.810	

7. How often do you check your e-mail before	225	127	.140	.842			
something else that you need to do?							
12. How often do you fear that life without the	.276	.176	222	.602			
Internet would be boring, empty, and joyless?							
19. How often do you choose to spend more		.299	.100	.534			
time online over going out with others?							
16. How often do you find yourself saying "just	.175		.385	.401			
a few more minutes" when online?							
Note. Extraction Method: Principal Component A	nalysis.				-		
Rotation Method: Promax with Kaiser Normalization.							
Rotation converged in 8 iterations.							
					-		

Appendix G: POGQ Pattern Matrix

POGQ Pattern Matrix

	Component	
-	1	2
14. How often do you get restless or irritable if you are unable to play games for a few days?	.960	156
9. How often do you get irritable, restless or anxious when you cannot play games as much as you want?	.862	
18. How often do you get irritable or upset when you cannot play?	.840	
11. How often do you argue with your parents and/or your partner because of gaming?	.837	124
6. How often do you fail to meet up with a friend because you were gaming?	.788	
16. How often do you choose gaming over going out with someone?	.698	.127
7. How often do you daydream about gaming?	.566	.298
15. How often do you feel that gaming causes problems for you in your life?	.503	.331
5. How often do the people around you complain that you are gaming too much?	.424	.362
3. How often do you feel depressed or irritable when not gaming only for these feelings to disappear when you start playing?	.417	.370
8. How often do you lose track of time when gaming?	167	1.005
2. How often do you play longer than originally planned?	128	.994
13. How often do you feel time stops while gaming?		.829
4. How often do you feel that you should reduce the amount of time you spend gaming?		.820
10. How often do you unsuccessfully try to reduce the time you spend on gaming?		.754
1. When you are not gaming, how often do you think about playing a game or think about how would it feel to play at that moment?	.396	.494
12. How often do you neglect other activities because you would rather game?	.454	.464
17. How often are you so immersed in gaming that you forget to eat?	.379	.419

Note. Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization. Rotation converged in 3 iterations.

Appendix H: OGSAS Pattern Matrix

OGSAS Pattern Matrix

	Component				
-	1	2	3	4	5
12. During the past WEEK, how much personal trouble (relationship, financial, legal, job, medical or health) has your online gambling caused you?	.977				
3. During the past WEEK, how many hours (add up hours) were you preoccupied with your urges to gamble online?	.970	153	.197	165	
2. During the past WEEK, how many times did you experience urges to gamble online?	.681	.328	227		
1. If you had unwanted urges to gamble online during the past WEEK, on average, how strong were your urges?	232	1.006	.135	172	
5. During the past WEEK, how often did thoughts about gambling online and placing bets come up?		.808		.116	
6. During the past WEEK, approximately how many hours (add up hours) did you spend thinking about gambling online and thinking about placing bets?	.182	.766			
7. During the past WEEK, how much were you able to control your thoughts of gambling online?			.898		
4. During the past WEEK, how much were vou able to control your urges?			.876		
8. During the past WEEK, approximately how much total time did you spend gambling online or on online gambling related activities?		130		.957	
11. During the past WEEK, how much emotional distress (mental pain or anguish, shame, guilt, embarrassment) has your online gambling caused you?				.887	

10. During the past WEEK, on average, how much excitement and pleasure did you feel when you won on your bet? If you did not actually win at online gambling, please estimate how much excitement and pleasure you would have experienced if	.945
you nad won.	0.60
9. During the past WEEK, on average, how	.868
much anticipatory tension and/or	
excitement did you have shortly before you	
engaged in online gambling? If you did not	
actually gamble online, please estimate	
how much tension and/or excitement you	
believe you would have experienced if you	
had gambled online.	
Note. Extraction Method: Principal Component Analysis.	
Rotation Method: Promax with Kaiser Normalization.	
Rotation converged in 6 iterations.	

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Appendix I: BDI-II Pattern Matrix

BDI-II Pattern Matrix

		Component	
	1	2	3
2. Pessimism	.888	152	
7. Self-Dislike	.877	146	.133
14. Worthlessness	.853		
8. Self-Criticalness	.791		110
9. Suicidal Thoughts or Wishes	.748		
1. Sadness	.700		.226
3. Past Failure	.618	.155	239
6. Punishment Feelings	.498	.259	405
10. Crying	.493		.193
13. Indecisiveness	.409	.114	.208
17. Irritability	.407	.220	.252
20. Tiredness or Fatigue	127	.920	
15. Loss of Energy		.850	
19. Concentration Difficulty		.773	
16. Changes in Sleep Pattern	133	.692	.177
5. Guilty Feelings	.171	.636	245
11. Agitation	.238	.560	
4. Loss of Pleasure	.264	.502	
12. Loss of Interest	.309	.351	.223
21. Loss of Interest in Sex			.812
18. Changes in Appetite		.175	.668

Appendix J: WHOQOL-BREF Pattern Matrix

WHOQOL-BREF Pattern Matrix

	Component					
-	1	2	3	4	5	6
17. How satisfied are you with your ability to perform your daily living activities?	.825	.164		160	124	
7. How well are you able to concentrate?	.782	103	184	.326		
18. How satisfied are you with your capacity for work?	.768	.164	.197	128	296	
10. Do you have enough energy for everyday life?	.704		136	.251		.232
16. How satisfied are you with your sleep?	.630	.141	.208	259		
9. How healthy is your physical environment?	.321	.218	.153	.183		
12. Have you enough money to meet your needs?		.775		277		
23. How satisfied are you with the conditions of your living place?		.703		221	.186	122
24. How satisfied are you with your access to health services?		.588	179	.241	.200	
13. How available to you is the information that you need in your day-to-day life?	.154	.563	101	.251		
14. To what extent do you have the opportunity for leisure activities?	.271	.544	327	.129	.102	
25. How satisfied are you with your mode of transportation?	213	.424	.213	.163	209	.290
11. Are you able to accept your bodily appearance?		110	.888			
19. How satisfied are you with vourself?	.222		.737			
2. How satisfied are you with your health?			.575			
1. How would you rate your quality of life?		.363	.459	.157		
8. How safe do you feel in your daily life?	100			.773		

5. How much do you enjoy life?	.147		.336	.624		
6. To what extent do you feel your life to be meaningful?	.196	131	.384	.605		304
21. How satisfied are you with your sex life?	302	.169			.812	
20. How satisfied are you with your personal relationships?			.184		.773	.170
22. How satisfied are you with the support you get from your friends?	.122	.332			.567	
4. How much do you need any medical treatment to function in	.257	124		265		.854
your daily life?3. To what extent do you feel that physical pain prevents you from					.124	.748
doing what you need to do?	110	222		260	202	175
around?	119	.335		.209	292	.475
26. How often do you have	.325	207	.223		.219	.347
negative feelings, such as blue						
mood, despair, anxiety,						
depression?						
Notes: Extraction Method: Principal Component Analysis.						
Rotation Method: Promax with Kaiser Normalization.						
Rotation converged in 11 iterations						



Appendix K: Supplemental Distribution of POGQ

Figure 6. Supplemental Distribution of POGQ



Appendix L: Crosstabs Distribution of Internet Usage Time by Gender

Figure 7. Crosstabs Distribution of Internet Usage Time by Gender



Appendix M: Crosstabs Distribution of Internet Usage Time by Class

Figure 8. Crosstabs Distribution of Internet Usage Time by Class



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