ONLINE GAMING BEHAVIOR AND PSYCHOSOCIAL WELL-BEING IN GREEK ADOLESCENTS

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Abstract

Online gaming is an appealing and popular activity among adolescents. However, several studies have shown that excessive engagement is related to psychosocial problems. The present study is based on data from the EU NET ADB project and examined the association between problematic online gaming and psychosocial well- being in a Greek school-student's sample. Problematic online gaming is classified in the DSM-5 as Internet Gaming Disorder (IGD) and was measured with the Assessment of Internet and Computer game Addiction Scale —Gaming Module (AICA-S-gaming). Negative aspects of psychosocial well-being were operationally defined as a combination of behavioral, affective and cognitive problems and were assessed through the Youth Self-Report (YSR) scale. The results indicate that IGD has a significant impact on the externalizing and internalizing dimensions of the YSR scale and particularly in the subscales anxious-depressed, withdrawn- depressed, social problems, thought problems, somatic complaints, rule-breaking behavior and aggressive behavior. Limitations and applications of the study are discussed.

Keywords: Problematic online gaming, psychosocial well-being, Internet Gaming Disorder, IGD

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1. Introduction

The modern era is characterized as the information or computer age, illustrating the high-tech social transition towards computerization (Castells, 2000), which has changed the nature of recreational activities among adolescents. Nowadays, most adolescents are entertained through computer gaming, a popular and highly amusing leisure activity (Kuss & Griffiths, 2012). At the same time, problematic gaming, the persistent and excessive engagement in computer or video games that cannot be controlled, has been identified as a potential risk (Muller et al., 2014). Internet Gaming Disorder (IGD) has been recently added as a clinical diagnosis in Section III of the DSM-V (American Psychological Association, 2013). In Europe, the EU NET ADB research project conducted in seven countries found that 1.6% of adolescents between the ages of 14-17 suffer from online gaming addiction (Tsitsika et al., 2012). Particularly, Greek adolescents demonstrated the highest prevalence rate of addiction with 2.5% meeting criteria for IGD (Tsitsika et al., 2012).

1.1. Psychosocial Well-being

Previous research has detected links between low levels of psychosocial well-being and problematic online gaming (Lemmens, Valkenburg, & Peter, 2011). In particular, interpersonal relationships of problematic gamers suffer and do not develop in a healthy manner due to lack of sharing common activities and recreational time (Lemmens et al., 2011). In addition, the lack of intimacy results in lower levels of empathy of problematic gamers in comparison to non-gamers (Lemmens et al., 2011). Notably, lack of empathy is manifested in the violent outbursts of many online gamers during game-play that leads to the accumulation of aggressive problem-solving responses in real life instances (Bartholow et al., 2005). Also, problematic online gaming has been associated with depressive symptoms, social incompetence, loneliness, low self-esteem and low levels of life satisfaction (Lemmens et al., 2011; Peters & Malesky, 2009; Williams, Yee & Caplan, 2008).

In an effort to further explore the relationship between online gaming and psychosocial well-being Tsitsika et al. (2012) conducted the EU NET ADB research project in a representative random sample of 12.938 European adolescents. The study findings indicated that adolescents diagnosed with IGD have stronger associations with several psychosocial features in comparison to at-risk gamers, normal gamers and no gamers. It was found that problematic gamers have higher scores both in internalizing and externalizing problems in comparison to all other groups. Specifically, problematic gamers manifested very strong associations with rule-breaking behavior and aggressive behavior. Also, strong associations existed for scales such as anxious-depressed, withdrawal-depressed, social problems, somatic

complaints, thought problems and attention problems. Finally, at-risk gamers had higher scores than normal gamers and no gamers for all scales, except from the somatic complaints scale.

1.2. Hypotheses

The present study is the first one to examine the association between online gaming and a broad range of psychosocial dimensions in an adolescent sample residing exclusively in Greece. Based on the aforementioned research findings by Tsitsika et al. (2012) the present study hypothesized that problematic gamers in the Greek adolescent population demonstrate decreased psychosocial well-being more often than at-risk gamers, non-problematic gamers and no-gamers. In particular, problematic users were expected to have higher levels of externalizing problems, internalizing problems, anxious-depressed scores, withdrawn-depressed scores, social problems, aggressive behavior, rule breaking behavior, thought problems, attention problems and somatic complaints than non-problematic gamers, at-risk gamers and no-gamers. Moreover, with the exception of somatic complaints, at-risk gamers were expected to have higher levels of psychosocial distress than non-problematic and no-gamers.

Furthermore an additional goal of the present study was to explore the frequencies of borderline and clinical cases in the various psychosocial subscales for the four online-gaming subgroups, namely, no-gamers, non-problematic gamers, at risk gamers and problematic gamers. Higher frequencies in clinical and borderline cases were hypothesized for problematic gamers in comparison to at risk gamers, non-problematic gamers and no-gamers as well as for at-risk gamers in comparison to non-problematic and no-gamers.

2. Method

2.1. Participants

The current study is based on data from the EU NET ADB project, a collaborative research project implemented by a network of European researchers (Tsitsika et al. 2012). The adolescents analyzed were 2005 (1020 females) Greek high-school students. The sample consisted of students ranging from 13- 20 years of age (M=16.11, SD= 0.57) who started using the Internet at

11.17 years of age (SD= 2.35) on average. Out of the 2005 participants analyzed for the present study 512 did not engage in online gaming, 1245 engaged in online gaming normally, 111 were at risk for problematic use, while 49 were addicted to online gaming and thus were the problematic gamers.

2.2. Material

The demographic questionnaire included questions about gender, date of birth, place of residence, place of birth, weight, height, great point average (GPA), parental situation, parental demographics, living situation and number of siblings (Tsitsika et al., 2012).

Online Gaming was measured through the Scale for the Assessment for Internet and Computer Game Addiction Gaming Module (AICA-S) (Wölfling et al., 2011). AICA-S was initially constructed s a diagnostic tool for clinical settings and uses the diagnostic criteria for IGD as described in DSM- 5 (American Psychiatric Association, 2013).

Psychosocial Well-Being was measured through the Youth Self-Report (YSR) (Achenbach & Rescorla, 2001). The YSR is a self-report questionnaire that includes 112 items and is constructed to assess psychosocial problems in adolescents from 11 to 18 years old. The YSR yields an overall score of psychosocial well-being, two broadband scales (internalizing and externalizing problems) and eight subscales.

2.3. Procedure and Design

The study was conducted in 10th grade student classes and used a random probability sample. All students in the selected classes had the chance to participate in the study by completing the questionnaire and an additional informed consent. The process of data collection lasted from October 2011 to May 2012. Also, school officials were asked to acquire written parental consent for the students participating in the study. On the day of administration, trained professional visited each class and explained to the students, who had received parental consent, the purpose of the study. Moreover, prior to the administration of the questionnaire, the researchers explicitly informed the students about the confidential and anonymous nature of the study. Then students who agreed to take part in the study were given the pen-and-pencil-format questionnaire and were encouraged to ask the test user for any clarification required. The whole process was approved by the national ethical commission and followed the terms of the Declaration of Helsinki. The detailed procedure in Greece can be found in the 2012 EU NET ADB report (Tsitsika, et al. 2012).

The present study employed a four (online gaming: no gaming, non-problematic gaming, at risk gaming, problematic gaming) between subjects factorial design. The dependent variables were the YSR total score, the internalizing and externalizing subscales of the YSR and the anxious- depressed, withdrawn-depressed, somatic complaints, thought problems, social problems, attention problems, rule-breaking behavior and aggressive behavior subscales of the YSR.

3. Results

The analysis revealed a significant effect of online gaming on internalizing problems, Welch's $F(3, 157.94) = 22.82$, $p < 0.01$. The comparisons with Bonferroni correction revealed that at risk gamers have similar levels of internalizing problems (M= 54.52, SD= 14.13) to problematic gamers (M=56.02, SD=20.16) and no-gamers have significantly lower levels of internalizing problems than both aforementioned groups (M=47.55, SD=10.42), while non-problematic gamers had the lowest scores compared to all other groups (M=45.12, SD=10.90) (see Table 1).

The analysis revealed a significant effect of online gaming on externalizing problems, Welch's $F(3, 168.90) = 26.98$, $p < 0.01$. The comparisons with Bonferroni correction revealed that that at risk gamers have similar levels of externalizing problems (M= 55.94, SD= 10.80) to problematic gamers (M=60.87, SD=14.59) and no-gamers have significantly lower levels of externalizing problems than both aforementioned groups (M=48.25, SD=9.78), while non-problematic gamers have similar scores (M=48.21, SD=15.86) to no-gamers (see Table 1).

The analysis revealed a significant effect of online gaming on anxious/depressed scores, Welch's $F(3, 154.82) = 14.51$, $p < 0.01$. The comparisons with Bonferroni correction revealed that that no-gamers have similar levels of anxious/depressed scores (M= 52.31, SD= 4.22) to non- problematic gamers (M=51.96, SD=4.20) and at risk gamers have significantly higher levels of anxious/depressed scores than both aforementioned groups (M=57.02, SD=9.52), while problematic gamers have higher anxious/depressed scores (M=59.50, SD=14.18) than all other groups (see Table 1).

The analysis revealed a significant effect of online gaming on withdrawn/depressed scores, Welch's $F(3, 155.26) = 17.42$, $p < 0.01$. The comparisons with Bonferroni correction revealed that no-gamers have similar levels of withdrawn/depressed scores (M=52.14, SD=4.40) to non-problematic gamers (M=51.81, SD=3.79) and at risk gamers have significantly higher levels of withdrawn/depressed scores than both aforementioned groups (M=55.65, SD=6.74), while problematic gamers had the highest withdrawn/depressed scores compared to all other groups (M=58.13, SD=9.96) (see Table 1).

The analysis revealed a significant effect of online gaming on somatic complaints scores, Welch's $F(3, 155.21) = 11.13$, $p < 0.01$. The Bonferroni correction comparisons revealed that no- gamers have similar scores on somatic complaints (M=52.97, SD=4.77) to non-problematic gamers (M=52.89, SD=5.32) and at risk gamers have significantly higher scores on Somatic complaints than both aforementioned groups (M=57.75, SD=10.37), while problematic gamers had the highest scores on somatic complaints compared than all other groups (M=60.70, SD=16.00) (see Table 1).

The analysis revealed a significant effect of online gaming on social problems scores, Welch's $F(3, 154.74) = 16.45$, $p < 0.01$. The Bonferroni correction comparisons revealed that that no-gamers have similar levels of social problems' scores (M= 51.63, SD= 4.37) to non-problematic gamers (M=51.85, SD=4.39) and at risk gamers have significantly higher levels of social problems' scores than both aforementioned groups (M=56.56, SD=8.60), while problematic gamers have higher social problems' scores (M=60.78, SD=14.98) than all other groups (see Table 1).

The analysis revealed a significant effect of online gaming on thought problems scores, Welch's $F(3, 155.45) = 20.27$, $p < 0.01$. The comparisons with Bonferroni correction revealed that that no-gamers have similar levels of thought problems' scores (M= 52.64, SD= 5.07) to non- problematic gamers (M=52.84, SD=5.41) and at risk gamers have significantly higher levels of thought problems' scores than both aforementioned groups (M=58.33, SD=9.26), while problematic gamers have higher thought problems' scores (M=64.30, SD=16.12) than all other groups (see Table 1).

The analysis revealed a significant effect of online gaming on attention problems scores, Welch's $F(3, 151.90) = 16.09$, $p < 0.01$. The comparisons with Bonferroni correction revealed that that no-gamers have similar levels of attention problems' scores (M= 52.16, SD= 22.20) to non- problematic gamers (M=51.14, SD=2.95) and to at risk gamers (M=54.15, SD=5.83), while problematic gamers have higher attention problems' scores (M=57.30, SD=9.31) than no-gamers and non-problematic gamers (see Table 1).

The analysis revealed a significant effect of online gaming on rule-breaking behavior scores, Welch's $F(3, 156.64) = 25.96$, $p < 0.01$. The comparisons with Bonferroni correction revealed that that no-gamers have similar levels of rule-breaking behavior's scores (M= 53.22, SD= 4.79) to non-problematic gamers (M=53.10, SD= 4.58) and at risk gamers have significantly higher levels of rule-breaking behavior's scores than both aforementioned groups (M=57.40, SD=6.58), while problematic gamers have higher rule-breaking behavior scores (M=62.52, SD=10.71) than all other groups (see Table 1).

The analysis revealed a significant effect of online gaming on aggressive behavior scores, Welch's $F(3, 155.22) = 20.88$, $p < 0.01$. The comparisons with Bonferroni correction revealed that that no- gamers have similar levels of aggressive behavior scores (M= 53.21, SD= 6.03) to non- problematic gamers (M=53.20, SD= 5.47) and at risk gamers have significantly higher levels of aggressive behavior scores than both aforementioned groups (M=57.99, SD=8.98), while problematic gamers have higher aggressive behavior scores (M=66.15, SD=15.02) than all other groups (see Table 1).problematic gamers (M=53.20, SD= 5.47) and at risk gamers have significantly higher levels of aggressive behavior scores than

both aforementioned groups (M=57.99, SD=8.98), while problematic gamers have higher aggressive behavior scores (M=66.15, SD=15.02) than all other groups (see Table 1).

In the group of problematic gamers, 21.7% were clinical cases while 13.0% were borderline cases for the total YSR scale, respectively, 27.7% and 14.9% for the externalizing scale, 21.7% and 4.3% for the internalizing scale, 22.9% and 2.1% for the anxious-depressed scale, 17.4% and 8.7% for the withdrawn-depressed scale, 19.6% and 6.5% for the somatic complaints scale.

Table 1. Post Hoc Comparisons Between Online Gamers across the YSR Scales

	Gamers					
	No-gamers			*Non-problematic*		*At risk gamers*
YSR Scales	*No-problematic*	*At-risk gamers*	*Problematic gamers*	*At-risk gamers*	*Problematic gamers*	*Problematic gamers*
Externalizing	*P*<1.0	*P*<0.01	*P*<0.01	*P*<0.01	*P*<0.01	*P*=0.28
Internalizing	*P*<0.01	*P*<0.01	*P*<0.01	*P*<0.01	*P*<0.01	*P*=1.0
Anxious-depressed	*P*<1.0	*P*<0.01	*P*<0.01	*P*<0.01	*P*<0.01	*P*=0.04
Withdrawn-depressed	*P*<0.92	*P*<0.01	*P*<0.01	*P*<0.01	*P*<0.01	*P*=0.01
Somatic complaints	*P*<1.0	*P*<0.01	*P*<0.01	*P*<0.01	*P*<0.01	*P*=0.04
Thought problems	*P*<1.0	*P*<0.01	*P*<0.01	*P*<0.01	*P*<0.01	*P*=0.01
Social problems	*P*<1.0	*P*<0.01	*P*<0.01	*P*<0.01	*P*<0.01	*P*=0.01
Attention problems	*P*<0.62	*P*<0.71	*P*<0.03	*P*<0.08	*P*<0.01	*P*=0.81
Rule-breaking behavior	*P*<1.0	*P*<0.01	*P*<0.01	*P*<0.01	*P*<0.01	*P*=0.01
Aggressive behavior	*P*<1.0	*P*<0.01	*P*<0.01	*P*<0.01	*P*<0.01	*P*=0.01

26.1% and 10.9% for the thought problems scale, 19.6% and 6.5% for the social problems scale, 10.9% and 6.5% for the attention problems scale, 23.9% and 17.4% for the rule breaking behavior scale and 32.6% and 13.0% for the aggressive behavior scale (see Table 2).

In the group of at risk gamers, 13.3% were clinical cases while 9.7% were borderline cases for the total YSR scale, respectively, 5.3% and 12.3% for the externalizing scale, 13.2% and 4.3% for the internalizing scale, 10.3% and 9.5% for the anxious-depressed scale, 5.3% and 5.3% for the withdrawn-depressed scale, 10.6% and 15.0% for the somatic complaints scale, 13.3% and 8.8% for the thought problems scale, 8.8% and 8.0% for the social problems

scale, 2.6% and 2.6% for the attention problems scale, 1.8% and 12.3% for the rule breaking behavior scale and 8.8% and 12.4% for the aggressive behavior scale (see Table 2).

In the groups of non-problematic gamers and of no gamers, the frequencies of clinical and of borderline cases in the various dimensions of the YSR were by far smaller as compared to the frequencies of clinical and borderline cases that were observed in the groups of problematic and of at risk gamers (see Table 2).

Table 2. Frequencies of Clinical and Borderline Cases in the Different Groups of Online Gamers

Gamers								
	No-gamers		*No-problematic gamers*		*At risk gamers*		*Problematic gamers*	
YSR Scales	*Borderline*	*Clinical*	*Borderline*	*Clinical*	*Borderline*	*Clinical*	*Borderline*	*Clinical*
YSR Total	3.6 %	0.4 %	3.0 %	0.9 %	9.7 %	13.3 %	13.0 %	21.7 %
Externalizing	2.9 %	0.8 %	3.5 %	0.8 %	12.3 %	5.3 %	14.9 %	27.7 %
Internalizing	4.4 %	1.1 %	4.0 %	1.1 %	8.8 %	13.2 %	4.3 %	21.7 %
Anxious-depressed	3.0 %	1.9 %	2.0 %	2.3 %	9.5 %	10.3 %	2.1 %	22.9 %
Withdrawn-depressed	1.5 %	1.7 %	1.0 %	0.7 %	5.3 %	5.3 %	8.7 %	17.4 %
Somatic complaints	2.9 %	1.3 %	4.3 %	2.0 %	15.0 %	10.6 %	6.5 %	19.6 %
Thought problems	3.6 %	1.9 %	2.2 %	2.4 %	8.8 %	13.3 %	10.9 %	26.1 %
Social problems	1.3 %	0.8 %	2.2 %	1.5 %	8.0 %	8.8 %	6.5 %	19.6 %
Attention problems	1.0 %	0.6 %	0.6 %	0 %	2.6 %	2.6 %	6.5 %	10.9 %
Rule-breaking behavior	2.9 %	0.2 %	3.1 %	0.3 %	12.3 %	1.8 %	17.4 %	23.9 %
Aggressive behavior	3.6 %	1.5 %	5.0 %	1.1 %	12.4 %	8.8 %	13.0 %	32.6 %

4. Discussion

The aim of the present study was to examine the magnitude of the effect of online gaming on psychosocial well-being in Greek adolescents. The first hypothesis of the study that problematic gamers have decreased psychosocial well-being in comparison to all other groups was confirmed for the scales of anxious-depressed, withdrawn-depressed, somatic complaints, social problems, thought problems, rule-breaking behavior and aggressive behavior. For the scales of externalizing problems, internalizing problems and attention problems problematic gamers have higher scores that non-problematic and no-gamers but similar scores to at-risk gamers. The second hypothesis, that at-risk gamers have higher scores that non-problematic and no-gamers in all scales except from somatic complaints, was mainly confirmed. At-risk

gamers had higher scores in all scales, including somatic complaints, with the exception of attention problems' scale, where at-risk gamers, non-problematic-gamers and no-gamers had similar scores. Moreover, astonishingly higher frequencies were observed in borderline and clinical cases for problematic gamers in comparison to at-risk gamers, non-problematic gamers and no-gamers. Higher frequencies were also observed in borderline and clinical cases for at-risk gamers in comparison to non-problematic and no-gamers. The findings indicate that IGD is related to several other comorbid psychosocial problems and stresses the need for clinical interventions in adolescents with problematic online gaming behavior.

4.1. Explanation of the Findings

Online gaming may temporarily offer social, recreational and personal gratification but excessive engagement can backfire to addictive behaviors entailing several pathological behavioral outcomes. Spending excessive time on online gaming hinders the accumulation of stable real life friendships and the development of social skills (Muller et al., 2014). Social interaction is displaced to superficial and short-term online interactions, which produces deterioration of present real-life interactions and in turn increases social isolation and magnifies feelings of loneliness (Griffiths & Davies, 2005). On that basis, we could offer an explanation for the strong relationship between problematic gaming and the social problem scale, which is related to expressiveness and extroversion in social contexts. Also, somatic complaints in problematic and even at-risk users could derive from spending prolonged hours on the computer screen and as a result having eye problems, dizziness, headaches and sleep disturbances (Dreier et al., 2013). Moreover, somatic complaints may have given rise to the thought problems scale since sleep deprivation, due to excessive engagement in online gaming during the late evening hours, is related to hallucinations (Chaudhury, 2010). Also, thought problems could stem from the obsessive-compulsive symptoms found in several addictions as well as in gaming addiction (Jang, Hwang & Choi, 2008). Obsessive- compulsive features include mental preoccupation and repeated routine of online game-play that induce persistent thoughts concerning online gaming (Jang et al., 2008). Also, aggressive behavior in problematic and at-risk gamers can be attributed to the fact that the majority of adolescents encounter aggressive behavior while playing online games (Lenhart et al., 2008). In particular, 63% of adolescents in the U.S report that they have witnessed other gamers being aggressive and mean during gaming, while 49% that they have encountered sexist, hateful and racist behavior during game-play (Lenhart et al., 2008). Moreover, the inability of online gamers with IGD to relax in real-life activities and their tendency to seek emotional relief in online activities can build up aggression in offline settings (Dreier et al., 2013). Therefore, when

Internet access is unattainable or denied, emotional and behavioral reactions of problematic gamers are aggressive and hostile (Dreier et al., 2013). In addition, rule-breaking behavior is relevant to aggressive behavior in the sense that problematic gamers may direct their hostility and aggression towards authority figures such as parents and teachers who occasionally forbid adolescents from access to the Internet (Dreier et al., 2013). Consequently, rule-breaking behavior represents the bypassing of parental control in order to engage in online gaming despite being instructed otherwise. Finally, depressive symptoms either in the form of anxiety or withdrawal may emerge from the aggregation of all the negative consequences of extensive online presence, such as alienation from offline interactions and activities, distress over wasting time online and subsequent family conflicts, academic failure, avoidance of real life instances and neglect for real life rewards (Tzavela et al., 2015).

4.2. Limitations

There are certain limitations to be considered in the present study. One limitation is the self-report nature for the accumulation of data. There is a strong influence of social desirability in such measures and particularly adolescents are more sensitive to social desirability cues, being more concerned with self-image and not having fully developed a stable self-concept. Even though both the YSR and the AICA-S have strong psychometric properties, a clinical assessment of IGD and psychosocial well-being by a trained professional would have stronger diagnostic accuracy. Future research could incorporate clinical interviews in addition to the present scales to assess IGD and psychosocial well-being and classify individuals to the relevant categories using both methods. Another limitation of the study is that it does not assess causal relationships between factors and consequently we cannot determine whether diminished psychosocial well-being preexisted IGD. Drawing from the present findings we can solely focus on the co-occurrence of problematic gaming and several malfunctioning dimensions of psychosocial well-being.

4.3. Applications

The current findings support the importance of psychotherapeutic counseling as a treatment for IGD due to its effectiveness in facing psychosocial problems. Considering the fact that IGD has many parallels to other addictions, adapting treatments used in substance-related addictions to fit IGD specific requirements could have a beneficial effect (Müller et al., 2014). On the same line of thinking, cognitive behavioral therapy is used as a tool for treating Internet Addiction and according to metanalytical findings it demonstrates positive therapeutic results (Winkler et al., 2013). Also, considering the social antecedents of IGD, group therapy

could prove to be extremely advantageous for adolescents with social problems (Park & Kim, 2011).

The present study is further relevant to educational fields, considering the fact that concurrent psychosocial problems with IGD affect attention (attention problems), cognition (thought problems) and ethical social conduct (rule-breaking behavior, aggressive behavior) which in turn may hinder scholastic performance and overall school behavior (Müller et al., 2014). Hence, the application of effective intervention programs that focus on problematic online gaming appears to be a research target of high interest and importance that has the capacity to improve the quality of the contemporary school environment.

Acknowledgements

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