

Extended Abstract

The Effect of Gender on Problematic Internet Usage: A Meta-Analysis*

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Abstract

The aim of this research is to analyze the effect of gender on problematic Internet usage by meta-analysis. Problematic Internet usage is defined by the deterioration of the important dimensions of individuals' lives, such as family and work, the failure to control the usage and compulsive usage of individuals due to the usage of the Internet. It is known that adolescents use the Internet more than other age groups. Therefore, adolescents are thought to be able to use the Internet in a non-functional way, besides, differences in the usage and duration of Internet usage according to gender have also been reported. PIUS and PIUS-A is being used in investigations on problematic Internet usage in Turkey frequently. Thus, the findings of the studies using these measurement tools were used in the analysis of this research. As a result of the literature review, 30 studies including PIUS and PIUS-A were detected and four studies were excluded from the analysis according to different reasons, thus the analyses were performed on the findings of 26 studies. Average effect size is .385 according to fixed effect model and could be considered small and in favor of males. Similarly, in studies where the type of research and the measurement tool used are considered as moderator variables, the effect size is small and in favor of males. As a result, problematic Internet usage of male adolescents may be noted as higher. The results were discussed in the light of cultural differences and parental attitudes.

Keywords

Problematic Internet usage • Gender • Meta-analysis • Adolescents • Technology

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The concept of problematic Internet usage (PIU) is defined by the deterioration in the important dimensions of one's life, such as family and work, the failure to control the usage and compulsive usage of individuals due to the usage of the Internet (Kim & Davis, 2009). Furthermore, it was seen that different results were obtained in the relationship of PIU and gender. There are studies in which PIU scores of females are higher than males (Gomez et al., 2017), whereas the studies in which PIU scores of male were higher than females' (Johansson & Gotestam, 2004; Morahan-Martin & Schumacher, 2000; Pontes et al., 2016). Moreover, there are studies showing that PIU does not change according to gender (Chou & Hsiao, 2000; Hall & Parsons, 2001; Hardie & Yi-Tee, 2007; Leung, 2004; Pawlak, 2002). The aim of this research is to evaluate the effect of gender on PIU by using meta-analysis for studies conducted in Turkey using PIUS (Ceyhan et al., 2007) and PIUS-A (Ceyhan & Ceyhan, 2014).

Method

Meta-analysis is the grouping of similar studies on a topic, theme or research area under certain criteria and interpreting the quantitative findings related to these studies (Dinçer, 2014). In this research, a meta-analysis of studies that examined the effect of gender on the PIU in Turkey is conducted.

Data Collection

Criteria used to determine the researches to be included in the meta-analysis are important for preventing publication bias. Berman and Parker (2002) state that the criteria should be appropriate for the purpose of the research and should be clearly stated. The criteria that have been taken into consideration in determining the studies to be included in this research are as follows; (i) the PIUS or PIUS-A must have been used in the study; (ii) the study has to be conducted between the year 2007 (the year which PIUS was developed) and april 2018 (the month which literature review for this study ended); (iii) the research report must be a published article or a completed graduate thesis (iv) the research sample and sufficient findings must have been reported. The number of researches meeting the specified criteria is 28.

Data Analysis

In this research, $0 \leq ES \leq 0.20$ (weak); $0.21 \leq ES \leq 0.50$ (small); $0.51 \leq ES \leq 1.00$ (medium); $1.01 \leq ES$ (large) levels by Cohen, Manion, and Morrison (2007) have been taken into consideration in interpretation of the effect sizes calculated over the Hedge's g value. Statistical analyzes were performed using CMA version of 2.2.064. Investigations on publication bias have been held using the funnel plot, FSN statistic, Kendall's τ coefficient and Egger's linear regression. It has been examined by standardized residues, heterogeneity tests and the forest plot, whether or not there are any outlier among the researches to be included in the meta-analysis.

Findings

Characteristics of the Research Studies

When the distribution of the researches according to the type of publication and the measurement tool used is examined; 16 of the 28 studies are found to be articles (57%), 11 were master's thesis (39%), and one doctoral dissertation (4%). PIUS was used in 19 (68%) and PIUS-A was used in 9 (32%) studies.

Publication Bias

Most of the 28 researches included in the first phase of the meta-analysis are found to be around the average line and show a symmetrical distribution according to this line. In addition, it is determined that two studies that have the characteristics of an outlier with relatively high standard errors had taken place outside the funnel plot. When these two studies which have positive effect size (in favor of females) are examined, it is determined that the studies are conducted on the students studying at secondary school (Altıntaş & Öztapak, 2016) and high school (Doğan et al., 2008) and in both researches, PIUS (Ceyhan et al., 2007) is used instead of PIUS-A (Ceyhan & Ceyhan, 2014).

When the individual effect sizes and confidence intervals of the studies were examined, it was seen that the PIU level of the males was higher in 26 studies and PIU level of the females was higher in two studies. In the forest plot, it is seen that these two studies are separated from the others. For the two studies, in which the females are reported to have higher PIU levels, the standardized residual values are determined to be 4.46 and 5.90, respectively and these two studies that have the characteristics of an outlier are excluded from the meta-analysis. In the remaining 26 studies, the funnel plot obtained for the purpose of examining the issue of publication bias is given in Figure 1.

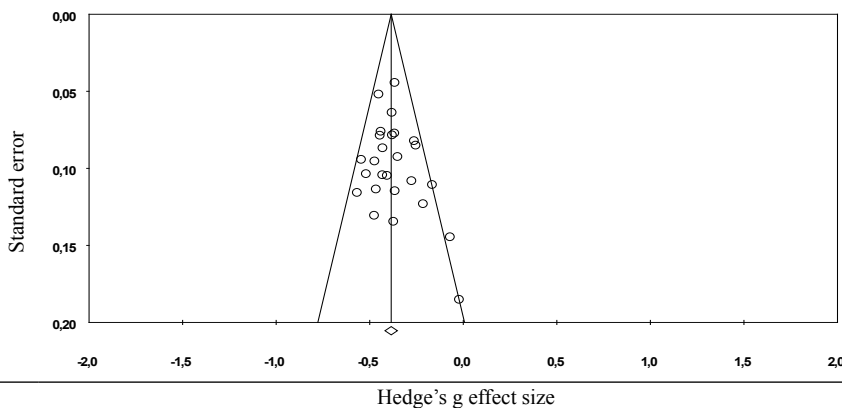


Figure 1. The funnel plot of meta-analysis researches.

In Figure 1, it is seen that all studies are close to the average line and show a distribution that could be considered symmetrical with respect to this line. The number of researches (FSN) required to be added to the studies included in the meta-analysis and to increase the p value above .05 is 2994. This number appears to be above the limit suggested by Rosenthal (1979) to indicate the number of k in the formula ($5 \cdot 26 + 10 = 140 < 2994$). Kendall's τ coefficient ($\tau = .168, p > .05$) and Egger's regression test results indicate that there is no publication bias ($\beta_0 = .834; \%95 \text{ CI: } [-0.615; 2.283], p > .05$). For the studies included in the meta-analysis, the effect sizes (Hedge's g) ranged from -.567 to -.022. The effect size is significant for 22 of the researches ($p < .05$); and not significant for four researches ($p > .05$). The differences for these studies were all in favor of males. Forest plot for these studies is given in Figure 2.

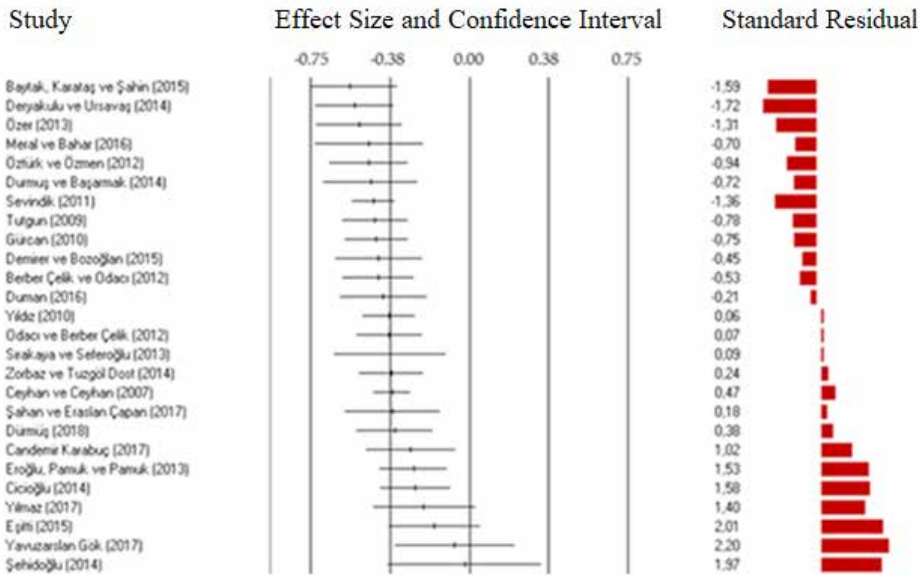


Figure 2. Forest plot for the studies included in meta-analysis.

It is seen in the Figure 2 that the standard residuals for two studies is above 2.00, which has been accepted normal for 26 studies. According to heterogeneity test, it has been seen that Q value is 32.673. The fact that this value is less than 37.652 with a χ^2 critic value of .95 significant level and 25 degrees of freedom means that the effect sizes show a homogenous distribution. It is stated that I^2 statistic, which can take values from 0% to 100%, is a measure of inconsistency between studies included in meta-analysis and that 25%, 50% and 75% values can be considered as the limit for low, medium and high heterogeneity, respectively (Higgins et al., 2003). The I^2 value obtained from the analysis indicates that 23.485 (23.485%) has low heterogeneity. According to all these findings, it was found appropriate to carry out the investigations according to the fixed effect model. The distribution of the effect size distribution

is determined as normal as a result of scrutiny, skewness and normality tests. Table 1 presents the findings about the effect of gender on PIU.

Table 1
The Effect of Gender on PIU

Model	Number of Studies	Effect Size and Confidence Interval (%95)				z
		ES	S _e	Low	High	
Fixed effect	26	-.385	.017	-.419	-.352	-22.719**
Random effects	26	-.385	.020	-.423	-.343	-18.898**

** $p < .00$.

In Table 1, it is seen that the effect size according to fixed effect model is -.385. It is seen that gender has a small effect on the PIU ($z = -22.719$, $p < .01$) because the obtained value is in the range of $0.21 \leq ES \leq 0.50$. In addition, the results obtained for the random effects model appear to be substantially similar to those obtained for the fixed effect model.

The moderator effect of the effect size values calculated for gender, the type of research (article / thesis) and the scale used in the studies (PIUS / PIUS-A) have been examined. The findings about analysis conducted for moderator variables are given in Table 2.

Table 2
Effect Sizes for Research Type and Scale Used As Moderator Variables

Moderator variable	Number of Studies	ES	Effect Size and Confidence Interval (%95)			z	Q _B
			S _e	Low	High		
Research type	Article	14	-.391	.023	-.437	-.346	-16.863**
	Thesis	12	-.378	.025	-.427	-.330	-15.230**
Scale used	PIUS	17	-.395	.019	-.432	-.357	-20.626**
	PIUS-A	9	-.351	.037	-.422	-.279	-9.585**

* $p < .01$.

In Table 2, no significant difference is observed between the effect size (-.391) obtained for articles and the effect size obtained for theses (-.378) in studies conducted by research type ($Q_B = .143$, $p > .05$). In studies conducted according to the form used, the effect size (-.395) obtained for the studies using the adult form is found to be slightly higher (-.351) compared to the studies using the adolescent form, whereas the homogeneity test shows that this difference is not statistically significant ($Q_B = 1.139$, $p > .05$).

Discussion

In this research, effect of gender on PIU is evaluated by meta-analysis. As a result of examining the effect of gender on PIU in 26 studies using PIUS and PIUS-A, it is determined that the standard effect sizes (Hedge g) ranged between -.567 and -.022, in other words, PIU is higher in favor of males.

When evaluated with cognitive, emotional and behavioral dimensions; PIU can be evaluated as related to many variables. While the fact that females are more likely to appear face to face social interaction (Siyez, 2017) and they are spending less time on the Internet than males (TÜİK, 2017) may seem as a protective factor for them; the fact that males are more likely to externalizing problems (Akin, 2014; Bozkurt, 2011; Yoo Kim & Stout, 2004), spend more time on the Internet, have more positive attitude towards the computer (Topçu, 2009) and the Internet (Cai et al, 2017) is considered to cause risk factors for PIU.

In a cross-cultural research, the differences seen in PIUs between genders are associated with the meeting platform on computer and the Internet (Li & Kirkup, 2007). Accordingly, gender differences are more evident in children who are acquainted with the Internet at home while they are less in children who meet in educational environment. Internet use became widespread in Turkey at the end of 1990's. 2017 TÜİK data shows that the rate of Internet connection in households is 80.7%. As stated in the research of Li and Kirkup (2007), the introduction of children to the Internet and computer in a home environment can be seen as a reason for the development of basic gender differences. Parents are the main people who should control the Internet usage of children at home. In their studies, Ayas and Horzum (2013) indicated that the gender of the child is effective in the attitudes of parents towards the Internet. According to this, it is found that parents have the highest rate of laissez-faire attitude for boys and girls, but have more laissez-faire and authoritative attitude for boys and more tolerant for girls. In the research of Büyükaşahin-Çevik and Çelikkaleli (2010), the Internet dependency levels of the children whose parents have laissez-faire attitude are found to be higher than the children with other parental attitudes. The results reveal the critical role of parents in preventing PIU for children starting to use Internet at home. At the same time, it can also be stated that the effect of parents on gender differences is supported by research results.

The effectiveness of prevention and intervention of the problem behaviors are related to the correct determination of the variables associated with these behaviors. In a systematic review examining the effectiveness of the programs applied to prevent internet addiction in adolescence period in Turkey, Kazakhstan, Korea, Hong Kong and Italy; it has been found that all programs are effective in decreasing the tendency of Internet addiction when the effectiveness of the programs related to Internet addiction and PIU are included in the research (Bağatarhan & Siyez, 2017). It is important to determine both the personal characteristics of the adolescent and the variables associated with the adolescents' peers, parents and teachers in the micro system. The evaluation of the reasons for the differentiation of PIU in girls and boys for further research is considered important in terms of determining the content of prevention and intervention studies. At the same time, it is thought that the fact that different

results according to the gender obtained in the international literature against the men in the domestic literature may arise from culture-specific differences. For this reason, detailed studies on this subject will be a guide in reaching the precise information.

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Meta-analize Dâhil Edilen Çalışmalar / Studies Included in Meta-Analysis

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