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Research Article

Association of Personality Traits and Risk of Internet Addiction in Adolescents

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SUMMARY

Purpose: This cross-sectional, descriptive study analyzes the association between personality traits and internet addiction in adolescents.
Methods: The study was conducted with 328 adolescents attending two high schools in the Aegean region of Turkey. The data were collected using a sociodemographic information questionnaire, the Internet Addiction Scale and the Adjective Based Personality Scale from students who gave their informed consent to participate. Data were assessed by descriptive statistics, t tests, and logistic regression analysis, using SPSS software.
Results: The students had an average age of 16.43 ± 1.47 years and 40.5% were female. The percentage of subjects at risk of internet addiction was 15.9% ($n = 52$), and 42.4% ($n = 22$) of them reported that the amounts of time they spent online was acceptable. We found statistically significant differences in the average subdimensional scores for extraversion ($t = 2.310$, $p < .050$) and openness to experience ($t = 3.35$, $p < .001$), and between students at risk of internet addiction ($n = 52$) and those who were not ($n = 276$).
Conclusions: Adolescents who were found to be at risk of internet addiction nevertheless reported on the survey questionnaires that the amount of time they spent online was acceptable. The study determined that participants' risk of internet addiction was associated with their levels of extraversion and openness to experience.

Introduction

In the 21st century, also known as the information age, computers and the internet have penetrated into all aspects of life. Internet use has been increasing in Turkey, as has been the case for all around the world. The statistics for 2014 indicate that 60.2% of the population in Turkey has access to the internet [1]. They also show that computer and internet use is the most common among those aged between 16 and 24 years, while internet use starts at age 10 (Turkish Statistical Institute).

Even though the use of developing technologies makes our daily lives easier, individuals, especially children and the young, are adversely influenced by misuse or overuse of technologies, computers and the internet. Since children and the young are still psychologically immature, they constitute a potential risk group for internet addiction [2].

Internet addiction is described as inability to stop internet overuse, tendency to perceive offline time as meaningless, excessive irritation and aggression during deprivation [3], a psychiatric condition involving maladaptive ideas and pathologic behaviors. Internet overuse causes one to have difficulty at home, work or school or in his/her psychological life [4]. Internet addiction is a disorder as risky as other types of addiction. It is especially common among the young, and can accompany or pave the way for other psychiatric disorders [5].

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Although studies have identified a number of factors associated with internet addiction, personality traits stand out as one of the most important factors [6–13]. Research has shown that internet use is positively correlated with extraversion, conscientiousness, and agreeableness, whereas there is a negative correlation between internet use and neuroticism and openness to experience. It is argued in these studies that extrovert individuals more often feel the need to communicate with others when compared to introverted individuals and thus they more often use the internet for interactive purposes. On the other hand, introverted individuals seem to use the internet mainly because it reduces the anxiety of being rejected or ridiculed, and it allows users to conceal their identities [6,10,14–16]. Although personality traits are linked with internet use, various studies have reported conflicting findings regarding the effects of the same personality traits on internet use (Batigun & Kilic; Engelberg & Sjoberg; Floros & Siomos; Samarein et al.; Servidio; Young & Rodgers). Furthermore, a review of the literature indicates that there are a limited number of studies regarding the subject.

Present study

The present study was motivated by conflicting findings in literature and the limited number of studies in Turkey on this subject [6]. The study was designed to examine the association between personality traits and internet addiction among adolescents.

Methods

Study design

This study used a cross-sectional, correlational design to examine the association between personality traits and internet addiction among adolescents.

Setting and sample

Power analysis was conducted to determine the size of the sample. When Type I and Type II errors were set as .05 and .20 (power 80.0%), respectively, the number of participants required for the sample was estimated to be 202. This calculated number of participants needed ($n = 202$) were based on internet usage hours reported in a study by Kuss et al [9]. Considering the number of students in the schools and the potential loss of participants, the plan was to incorporate two schools into the study. The number of high schools ($n = 25$) located in the city where the study was conducted was obtained from the Provincial Directorate for National Education. Each school was assigned a number and two schools were randomly selected using a table of random numbers.

The study sample consisted of 328 adolescents attending two senior high schools in a provincial center in Western Turkey. The students were selected by convenience sampling and volunteered to participate.

Ethical considerations

Ethics committee permission, institutional approval and parental consent were received for this study. Verbal consent was obtained from the participating students.

Measures

The survey consisted of three domains assessing study participants' sociodemographic characteristics, internet addiction level, and personality traits.

Sociodemographic Information Questionnaire

Participant background characteristics included age, gender, and grade level of the students, the age and education levels of their parents, and family financial status. It also included questions regarding internet usage, such as whether the students' homes have access to the internet, and the amount of time they spend online.

Internet Addiction Scale

The Chinese Internet Addiction Scale was developed by Chen, Weng, Su, Wu, and Yang [17]. A score of 57 or less indicates "non-risky", while a score of 58 or more indicates "risky internet usage". The scale consists of five subscales: "compulsive usage", "withdrawal", "tolerance", "time management", and "interpersonal/health problems". The subscales are based on the DSM-IV criteria for substance abuse [8,18]. The scale was adapted for the Turkish language by Kesici and Sahin in 2010 [19]. The Cronbach's alpha coefficient of the Turkish version of the scale was .88. Five factors explain 63.8% of the total variance, with factor loadings of 0.44–0.74 (Sahin Kesici and Ismail Sahin) [19]. Permission to use the scale was obtained from the author.

Adjective Based Personality Test (ABPT)

The ABPT was developed by Bacanli, Ilhan and Aslan [20] based on the five factor model. The ABPT consists of 40 items based on antithetical pairs of adjectives, which are rated on a 7 point Likert-like scale. Factor analysis yielded the following five factors: extraversion (e.g., "prefers to be alone/likes social get-togethers"), agreeableness (e.g., "vengeful/forgiving"), conscientiousness (e.g., "neat/disorderly"), neuroticism (e.g., "calm/agitated"), and openness to experience (e.g., "interested in art/not interested in art"). The extraversion and agreeableness subscales consist of nine items. The conscientiousness and neuroticism subscales each consists of seven items. The openness to experience subscale consists of eight items. These five factors were found to explain 52.6% of the scale's total variance. Factor loadings were 0.37–0.86 [20]. Subscale reliability coefficients are given in Table 1. Permission to use this scale was obtained from the author.

Data collection/procedure

First, written consent was obtained from the Provincial Directorate for National Education. Then, informed consent was received

Table 1 *Subscale Reliability Coefficients.*

Subscale	Original study[a] Cronbach's alpha	Original study[a] test–retest correlation	Current study Cronbach's alpha
Extraversion	.89	.85	.89
Agreeableness	.87	.86	.78
Conscientiousness	.88	.71	.80
Neuroticism	.73	.85	.74
Openness to Experience	.80	.80	.77

Note. [a]Bacanli et al. [20].

from the parents of the participants. Finally, the students were informed about the study and told that their participation was on a voluntary basis. The researcher explained the scales to the student volunteers before they filled out their forms. They were instructed not to write their names on the forms, so that they would feel more comfortable. Finally, the researcher distributed the forms to the literate student volunteers during one class session and collected them after they were completed.

Data analysis

Data were analyzed using means, percentages, independent sample *t* tests and logistic regression analysis. The independent samples *t* tests were used to compare the mean scores of the addicted and nonaddicted groups of adolescents on the subscales, and logistic regression was used to analyze the relationship between personality traits and internet addiction. All analyses were performed using SPSS version 15.0 (IBM SPSS Statistics, Chicago, IL, USA).

Results

The students, 40.5% of whom were female, had a mean age of 16.43 ± 1.47 years. Almost three quarters (73.8%) of their mothers and 61.0% of their fathers were elementary school graduates. All the students who participated in the study ($n = 328$) had access to the internet; 44.2% ($n = 145$) had internet access at home, and 45.4% ($n = 149$) of all students accessed the internet outside the home as well. While 47.3% of the students ($n = 155$) reported spending less than 5 hours per week online, 15.9% ($n = 52$) were found to be at risk for internet addiction. Of the 52 students at risk, 42.4% ($n = 22$) thought that the amounts of time they spent online were acceptable.

The difference between the mean total ABPT scores of the students with and without the risk of internet addiction was not statistically significant (Table 2). Moreover, no significant mean differences were found between these two groups of students on the conscientiousness, neuroticism, or agreeableness subscales ($p > .050$).

The mean extraversion score was 7.08 ± 1.46, for adolescents at risk for internet addiction and 6.55 ± 1.38 for adolescents who were not at risk for internet addiction. The mean difference was statistically significant ($p < .050$). The mean score for openness to experience among the adolescents at risk for internet addiction was 6.19 ± 1.15, while the adolescents who were not at risk had a mean score of 5.60 ± 1.12. Again, the mean difference was statistically significant ($p < .001$).

Logistic regression, using the backward regression method, tested the relationship between the personality traits and risk (no risk vs. at risk for internet addiction). The final model (Table 3) presents all significant interactions and relevant main effects. In order to follow up the interactions in more detail, linear regression analyses were performed for each group (no risk and at risk) and simple effects analyses were performed. The results of the logistic regression analysis showed that only 8.6% of the risk for internet addiction was explained by personality traits. The only subscale score that was statistically significant in the analysis was openness to experience ($p < .050$). Openness to experience was associated with a 1.79 fold increased risk of internet addiction. Only significant results are reported.

Table 3 *Internet Addiction Risk by Personality Traits*

ABPT subscales	*B*	Odds ratio	95% confidence interval	*p*
Conscientiousness	0.08	0.93	0.65–1.32	.668
Neuroticism	0.24	0.79	0.56–1.10	.159
Extraversion	0.13	0.11	0.79–1.65	.478
Openness to experience	0.58	1.79	1.08–2.96	.023
Agreeableness	0.31	0.73	0.53–1.00	.051
ABPT total	0.01	0.99	0.94–1.04	.668

Note. ABPT = Adjective Based Personality Test.

Discussion

The study findings are discussed in relation to the five personality trait model. In the current study, no statistically significant difference was found in the mean subscale scores for Conscientiousness between students at risk of internet addiction and those not at risk (Table 2). Studies indicate that highly conscientious individuals generally use the internet purposefully and have lower levels of risky usage, while less conscientious people are likely to experience problems related to internet addiction [6,7,15,16,21–23]. These results may show that adolescents who show a structured behavior have a low risk of internet addiction compared to those who are disorganized. As a consequence, an unstructured environment, such as the internet, could be classified as more interesting to explore than the real social relationship. The internet has changed the qualities of the communication channel, including relative anonymity and the ability to link up easily with others who have similar interests, values, and beliefs. Yet adolescents may use internet for educational reasons and not be affected by internet addiction [9–11]. Results from other studies supported this study finding.

There were no statistically significant group differences in the mean scores on neuroticism (Table 2). Studies have revealed that individuals with the neuroticism personality trait have high rates of risky internet usage [6,7,9–11,15,21,23]. According the five trait personality model, neurotic individuals experience anger, anxiety, irritability, apprehension, depression, and feelings of insecurity/vulnerability [24]. These individuals tend to experience increased levels of stress and interpersonal conflict because of this personality trait [25]. They are unable to cope with the stress enough. This indicates that they have a higher risk of developing addictions [26,27]. However, the results of our study revealed no statistically significant differences in the mean neuroticism scores of adolescents who were at risk of internet addiction and those who were not. Nevertheless, the mean scores of the at risk group were slightly lower than that of the other group. This may be attributable to the fact that individuals with this personality trait often socialize and form friendship groups with other individuals who display similar

Table 2 *Comparison of Adjective Based Personality Test (ABPT) Subscale Scores by Internet Addiction Risk in Students.*

Internet addiction risk	Conscientiousness	Neuroticism	Extraversion	Openness to experience	Agreeableness	ABPT total
No[a]	5.33 ± 1.39	3.36 ± 1.13	6.55 ± 1.38	5.60 ± 1.12	6.56 ± 1.49	192.77 ± 30.89
Yes[a]	5.45 ± 1.14	3.22 ± 1.04	7.08 ± 1.46	6.19 ± 1.15	6.57 ± 1.22	198.90 ± 31.43
T	0.53	0.79	2.31	3.34	0.05	1.15
p	.593	.427	.022	.001	.957	.248

[a] M ± SD

personality traits in environments such as the internet, which do not require face-to-face interaction. They experience less stress and problems in such structured environments they create for themselves [26,28]).

A statistically significant group difference was found in the mean extraversion subscale scores. The mean scores indicate that the adolescents who were not at-risk of internet addiction scored higher in extraversion (Table 2). According the five trait personality model, extraverted people tend to be vibrant, resourceful, cheerful, sociable, inclined toward positive emotions, enthusiastic, active, and talkative. Introverted (or less extraverted) individuals fail to cope with emotional and physical stress effectively, have difficulty making friends and establishing social relationships and, thus, are relatively more susceptible to addiction. Studies indicate that people with low levels of extraversion use the internet more frequently and may be at a higher risk of internet addiction [6,7,16,21,23]. While this is contrary to our findings, one possible explanation could be that, regardless of how much time they spend on the internet, highly extraverted students may have better self-control and a more positive self-concept, as well as an awareness that they should not break their social ties. Meahwhile, adolescent with introverted traits start internet usage because they find it easier to interact virtually than in real life, which in turn exacerbates their shyness in the real world and makes them turn to the internet [26–28].

A statistically significant difference was found in the openness to experience subscale scores. Students with risky internet usage were more open to experiences (Table 2). Studies indicate that due to their curiosity, open-mindedness, courage, and partiality towards change, people who are open to change use the internet more than other people do [6,7,16,21,23,29]. The current study found that students more open to experiences were at risk of internet addiction more than other students were, which differs from the findings reported in the literature. This difference may stem from the desire of adolescents to do unusual things, to be different, to take risks, and to be independent—traits the participants identified with when completing their questionnaires. On the other hand, in the open to experiences adolescent, a high rate of novelty-seeking may make students prone to heavy internet use because it is perceived as a pleasurable activity. Adolescents with high creative, imaginative and innovative cognitive levels may use information technology to engage excessively in pleasure activities; on the contrary, these adolescents may evaluate online activities as a transitory hobby, they protect themselves from the negative effects of Internet use [9–11].

No statistically significant group difference was found in the agreeableness subscale scores of the students (Table 2). The agreeableness scores of adolescents who were at risk of internet addiction were similar to those who were not at risk. Studies indicate a low to medium degree of association between agreeableness and internet addiction [6,7,21,23,29], and the results of this study are consistent with the literature. Agreeable individuals are defined as amiable, kind-hearted, good-natured, reliable, helpful, forgiving, credulous, and honest people. Adolescents with a low level of agreeableness could be more oriented towards developing problematic internet use as a means to satisfy their personal needs. Contrarily, normal agreeable subjects are less likely to exhibit internet addiction given their high quality prosocial interaction [11]. The lack of a significant difference between the two groups may be attributable to the fact that few participants had a serious internet addiction. Most importantly, that human nature renders most people ready to believe that many of the items in this subscale apply to them.

No statistically significant differences were found in the mean total ABPT scores (Table 2). There are ample studies that either support or reject the theory that personality traits influence internet usage [6,7,9–11,16,21,23,29]. In this study, some subscale items of personality traits were found to be associated with internet addiction, while others were found to have no association. In this respect, the current study contributes to existing literature since it was conducted with adolescents.

Logistic regression indicated that only 8.6% of the risk of internet addiction was explained by personality trait, and that the only variable that had a statistically significant association with internet addiction was the openness to experience subscale (Table 3). Openness to experience was associated with a 1.79 fold increased risk of internet addiction [21]. also observed a low level correlation between openness to experience and internet addiction. This is thought to be because individuals who are open to experience have traits such as being analytical, complex, curious, creative, independent, liberal, nontraditional, original, imaginative, courageous, fond of changes, and open-minded, and that these variables lead them to use the internet more [30].

Limitation

There are several limitations to the present study. First, the data were collected at only two senior high schools in a provincial center of Western Turkey; hence their generalisation could be of limited fort the all adolescents. Second, the study used cross-sectional research method. Therefore, the results of this study provide an indication of association, not causation. For this reason, it is recommended that planning a longitudinal cohort study. Third, this study results showed that the only sub-scale score that was statistically significant in the analysis was Openness to Experience. Consequently, it is recommended that repeating the study with more larger samples and in different provincial center to demonstrate the relationship among internet addiction and the other personality traits.

Conclusion

This study evaluated the risk of internet addiction in adolescents in relation to their personality traits. We found that the risk of addiction was 1.79 times higher for adolescents who were open to experience. Today, while internet usage is steadily increasing, we recommend preventive interventions aimed at protecting adolescents, particularly those who are open to experience, from internet addiction.

Conflict of interest

The authors declare no conflict of interest.

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