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RESEARCH ARTICLE

Investigation of Withdrawal, Controlling Difficulty, Disorder in Functionality, and Social Isolation in Problematic Internet Use in Adolescents

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ABSTRACT

Objective: Problematic internet usage, a significant and growing global problem in adolescents, is associated with the risk of future behavioural problems. This research explains the relationships between the factors affecting problematic Internet use among adolescents using the Structural Equation Modelling technique.

Methods: The study group comprised 756 adolescents studying in different schools. Descriptive statistics of the variables, confirmatory factor analysis, and structural equation modelling were used in the data analysis.

Results: A positive relationship was obtained between deprivation and control difficulty, impairment of functioning, and social isolation. It was found that the effect of impairment of functioning and social isolation on control difficulty was statistically significant. In addition, the study determined that the relationship between impairment of functioning and social Isolation was significant. When the coefficients related to path analysis were tested, it was found that the effect of impairment of functioning on deprivation was not statistically significant, whereas the effect of control difficulty and social isolation on deprivation was statistically significant.

Conclusions: There is a positive relationship between deprivation and problematic internet use, control difficulty, and social isolation, and a negative relationship with impaired functioning. In addition, it was concluded that the model created for the path analysis showed a good fit.

Keywords: Adolescents, Problematic Internet Use, Behaviour, Mental Health

INTRODUCTION

The Internet is a tool that makes significant contributions to people's lives by enabling people to access new information quickly and to correspond with other people quickly, and its use has increased at an incredible rate. Features such as mobile applications, education and entertainment opportunities, access to social media, and the mobile Internet make Internet use indispensable in daily life. Accessibility of the internet can lead adolescents to spend more time than they originally planned. For these reasons, the buildup in internet use brings with it important problems and dangers, as well as many benefits. Despite the many benefits that the Internet provides to individuals and society, a new problem area, namely excessive abuse of the Internet, has emerged. One of them is Problematic internet usage (PIU), that is, internet addiction (1).

Problematic internet use, a significant and growing global problem among adolescents, is associated with the risk of future behavioural problems (2). Problematic internet use was identified as features such as the inability to prevent the desire to use the internet excessively, the emergence of physical, mental, and social problems due to excessive use of the internet and computer, the emergence of excessive irritability and aggression when not connected to the internet, the inability to control the time waste on the internet, the increasing time waste on the internet, increasing and worsening of the individual's work and social life (3, 4). Problematic internet usage is considered a syndrome with many dimensions, consisting of behavioural and cognitive symptoms that produce negative results in social, professional, and academic aspects (4).

Although problems in the use of the internet, which is an important area of life in people's lives, can be observed at any

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age, the biggest risk group is young people between the ages of 12-18. Adolescents mostly use the internet for different purposes, such as doing their homework, communicating with their friends in their spare time, searching for answers to issues that interest them, and realising themselves in a place where they feel strong. When studies on adolescents are conducted, it is observed that the social development of children who use the internet for a long time and spend their time playing games is significantly retarded. These adolescents' self-confidence was low, their anxiety level was high, and an increase in aggressive behaviours was observed. While the useful use of the Internet provides many opportunities for adolescents to develop, its problematic use can also bring many risks to adolescents' lives (5).

This study is designed to address the relationships between the factors affecting the PIU of students in two schools determined in the centre of Istanbul, with the Structural Equation Modelling (SEM).

METHODS

Study Design and Participants

A cross-sectional study design was used in the study. We conducted the research between September 2019 and February 2020 in two public secondary schools with the students during the study period. There is still no clear way to determine sample size in structural equation modelling (6). The minimum sample size targeted for sufficient sample size in the study was calculated using the most common sampling formula. Aslan & Yazıcı (2016) reported a risky internet usage prevalence rate of 20.9%, focusing on the young population in Turkey (7), and a sample size of 391 students was calculated. The sample size was larger than that estimated in our study. Following approval from the ethics committee, necessary permissions were obtained from the Turkish Ministry of National Education and the Governorship of Istanbul. The inclusion criteria for this study group: age between 12 and 18 years, ability to read and write in Turkish, and who did not have a diagnosis of intellectual disability, and provision of consent from parents with a form for students before (completed the informed consent form). Adolescents with any diagnosed diseases and without consent forms were also excluded from the study. The questionnaires were explained to the students by the researchers. After students were informed that their participation was voluntary and they could leave without reason, a personal information form and internet addiction scale were distributed to the students during class hours as hard copies. The questionnaires were filled out by the students and were collected by the researchers. A total of 770 students from both schools agreed to participate in the study; however, 14 questionnaires were deemed missing or unsuitable.

Data Collection Tools

In the study; The Personal Information Form and Internet Addiction Scale were used.

Personal Information Form: The researchers developed this form consisting of open-ended and closed-ended questions from the works of literatüre (3, 5). Participants answered questions regarding self-identified gender, age, school, family type, parental work status, and Internet presence at home.

Internet Addiction Scale (IAS): This scale created for the Turkish Population. Turkish validity and reliability of the IAS were made. The IAS is comprised of 35 items scored using a five-point Likert-type scale, and each content is scored between 0 and 5. The IAS has four sub-factors as identified "Withdrawal", "Controlling difficulty", "Disorder in Functionality" and "Social Isolation". The Cronbach's alpha coefficient was calculated to be 0.94. In our research, exploratory factor analysis (EFA) for structural validity and confirmatory factor analysis (CFA) to examine the accuracy of factor structure were used. The total signified variance in the IAS is 47,463% (8). In this research, the total internet addiction scale had good internal consistency. The Cronbach's alpha level was α=0.93.

Statistical Analysis

While measuring the findings obtained in this study, SPSS 22.0 and LISREL 8.7 Statistics packages were used. The sociodemographic characteristics of the adolescents were analysed descriptively. Confirmatory factor analysis and validity and reliability tests were performed on the answers provided by the adolescents to the questions on the Internet Addiction scale, and the validity and reliability of the scale were provided. Then, the hypotheses of the model designated by the structural equation modelling were tested. SEM is a comprehensive statistical paradigm that allows testing hypotheses regarding the relationships between observed and covered variables (9). SEM includes many statistics and considers more than one parameter at the decision stage; thus, it is expressed as a powerful quantitative analysis (12). The results were evaluated at a 95% confidence and at $p<0.05$ significance.

We hypothesise that problematic internet usage is correlated with withdrawal as follows:

H1a: Functionality disorder affects Withdrawal in adolescents.

H1b: Controlling difficulty affects Withdrawal in adolescents.

H1c: Social isolation affects withdrawal in adolescents.

Ethical Considerations

In order to carry out the research, ethics committee confirmation was acquired because of the meeting of the Non-Interventional Research Ethics Committee of Bezmialem Vakif University, which was dated 07/11/2019 and numbered 17848. Following confirmation by the ethics committee, necessary permissions were obtained from the Turkish Ministry of National Education and the Governorship of Istanbul to apply the questionnaire to the students. This study was conducted in accordance with the Declaration of Helsinki.

RESULTS

Demographic Characteristics

The demographic characteristics of the adolescents are presented in Table 1. The mean age of the adolescents who participated in the research was 16.01±1.15 years. It was found

that 63.0% of the students were male, their family types were nuclear families (81.3%, n= 755), mothers of 73.1% of students, and fathers of 7.9% of students were not working. In addition, it was determined that most respondents (83.9%) used the Internet at home (Table 1).

Table 1: Descriptive statistics on participants

Gender	**n**	**(%)**
Girl	279	37.0
Boy	476	63.0
Total	755	100.0
Family Type	**n**	**(%)**
Nuclear family	614	81.3
Extended family	116	15.4
Split family	25	3.3
Total	755	100.0
Internet presence in the home	**n**	**(%)**
Yes	634	83.9
No	122	16.1
Total	756	100.0
Age	**mean**	**S.D.**
	16.01	1.158

Confirmatory Factor Analysis (CFA) Results for the Internet Addiction Scale

Before moving on to the parameter estimations of the model, we checked whether the variables provided the normality assumption to determine an appropriate estimation. The results of single and multiple normality tests of the data were examined. According to these results, all factors used in our model were analysed using the Shapiro-Wilk normality test, and it was shown that the input was not fit for distribution using the Henze-Zirkler multiple test (HZ=1.406; p<0.05). While parameter estimation is performed in CFA and SEM, it is important to determine whether the variables satisfy the assumption of normality. In this case, before starting the analysis of the models, the Henze-Zirkler multiple normality test for the variables was used. Because of the Henze-Zirkler Multiple normality tests, it was found that the variables were not fit for normal distribution (HZ=1.406; p<0.05). As a result, the "Diagonal Weighted Least Squares Method" was used for parameter estimation in CFA and SEM.

When the reliability analysis values of the scale are examined; CFA and Cronbach's alpha internal consistency (α=0.93) are suitable for the IAS. In addition, the standardised coefficient worths of the 4 sub-dimensions of the Internet addiction scale are statistically important (p<0.05). Since Cronbach's Alpha coefficient values are ≥ 0.80, the scale is highly reliable (13) (Table 2). With all test results of the SEM installed in Fig. 1, it is seen that the research model fit index values of the installed model, values were found as Chi-square/df (cmin/df) (3.96)), GFI (0.98), CFI (0.98), NNFI (0.97), NFI (0.97), SRMR (0.064), and RMSEA (0.063). They were acceptable and the results were within the limits of a good fit (10). Thus, the values indicate that the data support the model.

Table 2: Cronbach's alpha values

Factor	**Cronbach Alpha**
Withdrawal	0.857
Controlling Difficulty	0.843
Disorder in Functionality	0.840
Social Isolation	0.867

Results of Structural Equation Model Analysis

Exploring correlations between withdrawal, controlling difficulty, disorder in functionality, and social isolation, withdrawal showed a positively high intensity or moderately positive correlation with other research variables (p<0.05) (Table 3).

Table 3: Correlations among the study variables

Factor	**Mean**	**SD**	**1**	**2**	**3**	**4**
1. Withdrawal	29.97	8.93	1.000	0.642*	0.570*	0.495*
2. Controlling Difficulty	22.35	7.83		1.000	0.681*	0.510*
3. Disorder in Functionality	15.18	6.04			1.000	0.621*
4. Social Isolation	12.35	5.63				1.000

*p<0.05 SD: Std. Deviation

Fig. 1 and Table 4 indicate the results of the SEM analysis installed to demonstrate how much PIU is linked to withdrawal, controlling difficulty, functional disorder, and social Isolation in adolescents. The equations for the coefficients in Table 4 are given below.

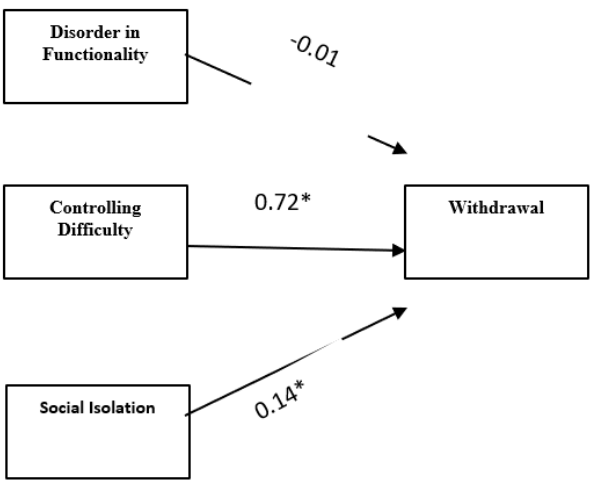

Figure 1: SEM Path diagram.

Withdrawal=0.01*Disorder in Functionality+0.51* Controlling difficulty+0.10*Social isolation (1)

When the coefficients related to Equation (1) are examined in the table, it was observed that controlling difficulty and social isolation significantly affect withdrawal statistically ($p<0.05$). However, functional disorder did not significantly affect withdrawal ($p >0.05$). The R2 values of the factors are expected to exceed 0.50, which is the acceptable limit (14). The coefficient of determination was R2 = 0.65 in our study. It was observed that 65% of the changes in controlling difficulty and social isolation that explained withdrawal from PIU in adolescents were explained by this model (Table 4). In this case, although the H1a hypothesis is not supported, the H2a and H3a hypotheses are supported.

Table 4: Path Factors in the SEM

Path	Unstandardised β	Standardised β	S.E	t	p	R^2
DF → Withdrawal	-0.01	-0.01	0.075	-0.07	0.944	
CD → Withdrawal	0.51	0.72	0.061	8.30	0.000*	0.65
SI → Withdrawal	0.10	0.14	0.046	2.12	0.034*	

*p<0,05 DF: Disorder in Functionality CD: Controlling Difficulty SI: Social Isolation S.E.: Standard Error

DISCUSSION

The internet has become a necessary need in people's lives; however, PIU can have a negative effect, especially on adolescents. There is a lack of studies determining many correlates of PIU worldwide (13). This research aimed to investigate the factors affecting PIU among adolescents undergoing SEM.

The average age of the adolescents participating in the research was similar to that of the studies conducted with adolescents (14, 15). Regarding PIU, males were associated with more PIU symptoms. Male gender was positively related to behavioural problems. In line with previous research, symptoms related to PIU were found to be effective because of the high number of male students in our study (16,17,18). According to the data of the Turkish Statistical Institute (TSI) regarding internet usage in Turkey, while it was 72.9% for persons in the 16-74 age group in 2018, it increased to 87.1% in 2023. In addition, in 2023, it was observed that 97.5% of homes have access to the internet. This is an indication of how widespread the Internet is across the country, as in our study (19). Accessing the Internet at home and living in a nuclear family affect students, which may lead to social isolation or other problems, such as stress, anxiety, depression, and social isolation (20,21). This situation turns into PIU, as observed in our study.

Measurement models were created for the scale used in this study, and the subdimensions that explain each concept meaningfully and the expressions in these dimensions were determined by CFA. For the test results of the Internet addiction CFA Model, it can be concluded that the CFA model is steady and significant because its values are acceptable and are within the limits of good agreement (12, 22). The Cronbach's Alpha values were ≥ 0.80 and have a high degree towards one. In this case, the Internet addiction scale is valid and reliable, according to the CFA and Cronbach's alpha coefficient values. Thus, the answers given by the adolescents to the questions were found to be generalisable (11, 23).

PIU is as important an addiction as substance addiction; it can be considered a group of behavioural problems (26) or behavioural control problems (25). Addictive behaviours to relieve mental effects can be used as coping strategies however these behavioural models are more difficult to handle in the long term (20). It has been stated that withdrawal, which is the most serious emotion among addicted students, is due to problematic internet usage (8). In a similar study, it was observed that as the daily internet usage time increased, the withdrawal, controlling difficulty, and disorder scores in functionality increased statistically (26). This study showed a positive relationship between withdrawal and controlling difficulty, functional disorder, and social isolation. Furthermore, it was determined that the variables controlling difficulty and social isolation in internet usage affected withdrawal. H1b and H1c were accepted in line with this result. Based on these results, it can be concluded that withdrawal is common in the presence of problematic internet use. Withdrawal affects the negative impact of internet use on daily routines, which can lead to isolation from normal life, breakdown of daily routines and roles, and thus sociable and academic problems (12, 27, 28). It was found in our study that controlling difficulty, which was affected by the disorder in functionality and social isolation, and the relationship between the disorder in functionality and social isolation was also significant. Consistent with earlier research, the finding that controlling difficulty supports these links for PIU symptoms demonstrates that students experience control difficulties (25, 26). In addition, disorder in functionality did not have a significant effect on withdrawal; thus, H1a was rejected. In PIU, the cause of functional disorder may be loss of control, poor physical health, and social isolation. Asocial adolescents may have a higher problem with control disorders than others (2). More time spent on the internet can increase social isolation. Studies on the psychological profiles of Internet users have found a relationship between social anxiety, social isolation, and PIU (29,30,31). Morahan-Martin (1999) and Kim, LaRose, and Peng (2009) also emphasised the relationship that excessive use of the Internet leads to social isolation (32, 33). Social isolation rates are higher among individuals who are not addicted. People with Internet addiction also refuse other communications and work because they are too busy with the Internet (34, 35). Similarly, et al. (1998) reported that internet-addicted students delay their daily important communication with their families and friends because they spend excessive time online (36). Social isolation in internet addiction is also related to a lack of social skills and shyness. People who lack social skills in daily life use online activities to socialise, and this

may cause PIU and create negative life experiences that can lead to unhappiness (32). The inability of virtual social support provided via the Internet to turn into permanent relationships in real life continues to increase social problems and create a vicious circle (37).

CONCLUSION

It can be seen that there is a restricted amount of studies that determine the variables that predict PIU, and recent studies have led to quantitative methods. From this perspective, we believe there is a need for qualitative research to determine the variables that have the power to predict problematic internet use (38). In addition, experimental and longitudinal studies with different variables are useful in the future. Adolescents generally prefer the internet for various reasons in terms of their desire for acceptance and relationship building. Therefore, it is necessary to create environments where adolescents can meet their social needs in real life instead of the virtual world and increase their social skills. Therefore, especially from adolescents, families, teachers, and field experts, opportunities should be created for children to express their feelings. It may be beneficial for mental health professionals and school nurses to focus on awareness-raising activities with young people to prevent this addiction.

Limitations

There are some limitations in this study, which is aimed to fill the gap in this field, as in previous studies, since there are few studies in the literature in which SEM analysis is performed using macro data. Although there are many factors associated with withdrawal, hypotheses were established based on studies conducted with adolescents, dependent independent variables were determined in this direction, and the relationship between them was analysed with the help of SEM. In the research prepared for this purpose, 756 usable data were obtained. Therefore, the findings are valid only for the research scope and cannot be generalised. The addiction level of individuals' internet use was defined using only a scale, and no clinical interviews were conducted.

Ethics Committee Approval: This study was approved by the ethics committee of Non-Interventional Research Ethics Committee of Bezmialem Vakif University, which was dated 07/11/2019 and numbered 17848.

Informed Consent: Written consent was obtained from the participants.

Peer Review: Externally peer-reviewed.

Author Contributions: Conception/Design of Study-M.B.S. ; Data Acquisition- S.B.; Data Analysis/Interpretation- S.B., M.B.S.; Drafting Manuscript- M.B.S., S.B.; Critical Revision of Manuscript- S.B., M.B.S. ; Final Approval and Accountability- M.B.S., S.B.

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