

ORIGINAL ARTICLE / ORJİNAL MAKALE

Effect of Technology Addiction Training Program on Individuals' Internet Addiction and Problematic Media Use

Teknoloji Bağımlılığı Eğitim Programının Bireylerin İnternet Bağımlılığı ve Problemli Medya Kullanım Durumlarına Etkisi



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Abstract

Background: İnternet and media tools are widely used by adults and children.

Objective: To investigate effect of technology addiction training program applied to elementary and middle school students and parents with participation of university students, on individuals' problematic media usage and internet addiction situations.

Methods: It was quasi-experimental study conducted in 2022-2024. Technology Addiction Training Program was applied to elementary and middle school students with university students. In the other stage of research, students' parents were trained. "Digital Addiction Scale, Internet Addiction Scale and Problematic Media Use Measure" were administered before and after training. Quantitative data was analyzed by a paired t-test to determine whether there was a difference between before and after the training program.

Results: Mean score of all students on digital addiction scale before technology addiction training program was 47.42 ± 16.19 , and after training 45.07 ± 18.31 . Statistically significant difference was determined between mean elementary school digital addiction scale scores and all students before and after training program ($p < 0.05$). There was no statistically significant difference between parents' Internet Addiction Scale before and after training ($p > 0.05$).

Conclusion: Digital addiction status of students was medium level and internet addiction status of parents was low level. Children's problematic media use was moderate. Technology education training given to students positively affects their internet addiction levels. It is recommended that school nursing plan training to simultaneously increase digital awareness of children and parents.

Keywords: Internet addiction, Problematic media use, Digital addiction, Parent, Child

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Öz

Giriş: İnternet ve medya araçları yetişkinler ve çocuklar tarafından yaygın olarak kullanılmaktadır.

Amaç: Üniversite öğrencilerinin katılımıyla ilkökul ve ortaokul öğrencilerine ve ebeveynlerine uygulanan teknoloji bağımlılığı eğitim programının bireylerin internet bağımlılığı ve problemli medya kullanım durumlarına etkisini araştırmaktır.

Yöntem: Araştırma 2022-2024 yılında, yarı deneysel araştırma olarak yürütülmüştür. İlkokul ve ortaokul öğrencilerine üniversite öğrencilerinin katılımıyla Teknoloji Bağımlılığı Eğitim Programı uygulanmıştır. Araştırmanın diğer aşamasında ise örnekleme dahil edilen öğrencilerin ebeveynlerine Teknoloji Bağımlılığı konusunda Google Classroom üzerinden çevrimiçi eğitim verilmiştir. Bireylere eğitim öncesi ve sonrası "Dijital Bağımlılık Ölçeği, İnternet Bağımlılığı Ölçeği ve Problemli Medya Kullanım Ölçeği" uygulanmıştır. Eğitim öncesi ve sonrası elde edilen verilerin karşılaştırılmasında eşleştirilmiş örneklem t-testi kullanılmıştır.

Bulgular: Öğrencilerin teknoloji bağımlılığı eğitim programı öncesi dijital bağımlılık ölçeği puan ortalaması 47.42 ± 16.19 , eğitim sonrası 45.07 ± 18.31 'dir. Tüm öğrencilerin ve ilkökul öğrencilerinin teknoloji bağımlılığı eğitim programı öncesi ve eğitim sonrası dijital bağımlılık ölçeği puan ortalaması arasında istatistiksel olarak anlamlı fark belirlenmiştir ($p < 0.05$). Ebeveynlerin çevrimiçi teknoloji bağımlılığı eğitim programı öncesi ve sonrası İnternet Bağımlılığı Ölçeği puan ortalamaları arasında istatistiksel olarak anlamlı fark belirlenmemiştir ($p > 0.05$).

Sonuç: Öğrencilerin dijital bağımlılık durumlarının orta düzeyde olduğu, ebeveynlerin internet bağımlılığı durumlarının düşük düzeyde olduğu belirlenmiştir. Ebeveynlerin çocuklarının problemli medya kullanım durumlarının orta düzeyde olduğunu düşündükleri saptanmıştır. Öğrencilere verilen teknoloji eğitim programının öğrencilerin internet bağımlılığı düzeylerini olumlu etkilediği belirlenmiştir. Çocukların ve velilerin dijital farkındalıklarının eş zamanlı olarak artırılması için okul hemşireliği tarafından eğitim planlanması önerilmektedir.

Anahtar kelimeler: İnternet bağımlılığı, Problemli medya kullanımı, Dijital bağımlılık Ebeveyn, Çocuk

INTRODUCTION

Today, technology, which affects interpersonal communication and covers every aspect of our lives, changes the way we communicate (Onyeator & Okpara, 2019). The internet and media tools, which are one of the technology products, are widely used by adults and children (Tuna, 2015). Individuals can constantly communicate with each other and be informed about developments in the world thanks to the internet and media tools. The internet greatly affects many areas (Erses & Müezzini, 2018). Since the internet is cheap, it has quickly entered homes and become easily accessible (Turkish Statistical Institute, 2021). Misusing computers and internet, originally invented for human benefit, can cause several problems (Eşgi, 2016; Lebni et al., 2020). If the use of the internet is for a useful purpose, if it

does not negatively affect the person's life, and if it has not become the purpose of life, it can be mentioned as purposeful use. On the contrary, if it has become the center of a person's life, if it has started to affect the person negatively, and if there are behaviors that comply with the addiction criteria set by researchers in the desired numbers, internet addiction is mentioned. Internet addiction is also a type of technology addiction, which is in the category of behavioral addictions (Kurniasanti et al., 2019). Internet addiction negatively affects individuals' psycho-social health and their relationships at home, school, and workplace (Eşgi, 2016). Children's use of tools such as social media and digital games has especially increased in recent years. In the 21st century, children's outdoor play has been restricted due to the intense sense of anxiety associated

with the concept of 'risk', which has strengthened their relationship with media tools (Fletcher, 2021). The belief that the internet can offer kind of support, when it is much harder to obtain it in the real world of social interactions, is the reason why people become addicted to the internet (Neverkovich et al., 2018). Numerous studies have shown that prolonged exposure to screens for play, entertainment, etc. at a very young age has harmful effects on children's cognitive, psychological, social, and neurological development (Allchorne et al., 2017; American Academy of Pediatrics, 2016; Lissak, 2018). Especially in children, both physiological and psychological problems such as dry eyes, headaches, back pain, developmental disorders, eating problems, sleep problems, introversion, and avoidance are observed (Karayağız Muslu & Bolışık, 2009). Digital media is an effective tool for self-expression and empowerment and an endless source of information, but children are vulnerable in the digital world due to online aggression, cyberbullying, and sexual and violent content (Livingstone et al., 2015).

Parents plays an important role in the child's life, and are the most influential people around the child to model their behavior. Parent plays an important role in the child's life. Parents' communication with each other and their children affects the child's development (Çelikbaş, 2023; Dinçer et al., 2023). The most prominent feature that distinguishes the family from other social communities is the depth of communication between individuals (Çelikbaş, 2023; Gür, 2019). In families where communication between parents and children is healthy, children can express themselves easily and are happy to feel that their feelings and thoughts are understood. Therefore,

parents' reactions, thoughts, and attitudes regarding the use of the internet and media tools greatly affect their children and the relationship between them (Dinçer et al., 2023; Gür, 2019). Parents who adopt an overprotective attitude and constantly try to control their children's behavior, or those who adopt an overly authoritarian attitude constantly imposing on the child what behavior to do can trigger internet addiction (Çelikbaş, 2023; Dinçer et al., 2023; Doğan & Döğer, 2023; Yayılacı, 2019).

The most effective and less costly fight against addiction is preventive efforts. Technology addiction training is an important step in raising awareness of this issue in society (Erses & Muezzin, 2018). Raising public awareness for an effective fight against technology addiction can be effective in preventing addiction before it occurs (Gaysina & Zakirova, 2017). Providing effective technology addiction education to children and their parents together is considered to be essential. Technology addiction training program aims to be preventive and to appeal to children, young people, and parents, who constitute the most important segment of society. Since technology addiction is a public health problem that concerns the whole society, its solution is not to educate children individually but to educate all family members. In addition, this project aimed to raise university students with increased awareness about technology addiction. In addition, this study aimed to enable university students to develop technology addiction awareness in children from a young age by applying the specialized training program on technology addiction to elementary and middle school students within the scope of peer education and to inform parents about the correct use of

technology by an expert psychologist.

Research Questions

1. Does technology addiction training program applied to elementary and middle school students affect their digital addiction status?
2. Does technology addiction training program applied to parents affect parents' internet addiction and their children's problematic media use?
3. Does parents' internet addiction affect their children's problematic media use to what extent?

Research Hypothesis

H1 The technology addiction training program applied to elementary and middle school students affects their digital addiction status.

H2 Technology addiction training program applied to parents affects parents' internet addiction and their children's problematic media use.

MATERIAL and METHODS

Type of the Research

This research was carried out as a quasi-experimental study with a pre-test-post-test design. The study was carried out in 3 stages.

Place of the Research

This study was conducted in elementary and two middle schools in northern Turkey on March- June, 2023.

Preparation of Technology Addiction Training Program (First Stage)

Before starting the study, the Technology Addiction Training Program was created. Technology Addiction Training Program created by the researchers in line with the literature was finalized by taking five expert opinions (Gaysina & Zakirova, 2017; Kırloğlu et al., 2023). Expert opinions were obtained, two

were academicians in pediatric nursing, one was a psychologist, and two were academicians in public health nursing. Training content consisted of a "definition of technology addiction, types of technology addiction, risk factors for technology addiction, harms of technology addiction, solutions to overcome technology addiction, correct use of technology, and safe internet use".

Sample of the Research

First Stage of the Study

In the first stage of the study, the study universe consisted of the 3rd-grade students taking the Pediatric Nursing Course at a university of northern Turkey, faculty of health sciences, department of nursing in the spring semester of the 2022-2023 academic year. Sample consisted of the students who participated in the school health nursing practice. In this regard, six university students who volunteered to participate in the study and were taking the 3rd-grade Pediatric Nursing Course were given a 4-hour training on technology addiction education in elementary and middle school students by the department's faculty members. Purpose of implementing the training program through university students is to increase university students' awareness of technology addiction. It is also to support elementary and middle school students' learning through peer support education.

Inclusion Criteria: To take a Pediatric Nursing course, to participate in school health nursing practice, and to volunteer to participate in the study.

Exclusion Criteria: Not participating in the school health nursing practice, not filling out all of the forms to be applied and leaving the study at any stage.

In the study process, "Individual Descriptive

Form and Internet Addiction Scale" were used to collect student data.

Second Stage of the Study

In the second stage of the study, the faculty members and university students implemented the Technology Addiction Training Program for elementary and middle school students. Researchers, in their case study titled "Effect of Parents' Internet Addiction Status on Children's Problematic Media Use and Child-Parent Relationship" conducted in center region of the city. Study found that children whose parents were internet addicted used problematic media and the parent-child relationship was negatively affected (Uzsen et al., 2025). Therefore, the students attending elementary and middle schools in center district of northern Turkey in November in the fall semester of the 2023-2024 academic year constituted the universe of the study. Convenience sampling, one of the purposive sampling methods, was employed in the study. Convenience sample is the one that is drawn from a source that is conveniently accessible to the researcher (Andrade, 2021). With this method, the researcher can prefer individuals and groups that the data can be collected easily. All students at one elementary and two middle schools in the central area of the northern city where the study took place made up the study population. A total of 226 elementary school students and 216 middle school students, 442 students in total, studying in these schools constituted the study sample. Post hoc analyses were conducted using the G. Power 3.0.9.4 program using the students' mean scores from the digital addiction scale before and after the training program. In this direction, the power of the study was calculated as 88%.

Inclusion criteria: Participate in training and

volunteer to participate in the study.

Exclusion criteria: Not completing all the forms to be applied in the study, and leaving the study at any stage.

In the study process, "Individual Descriptive Form and Digital Addiction Scale" were used to collect data from students.

Third Stage of the Study

In the third stage, the parents of the children studying in the specified elementary and middle schools constituted the study universe, and the parents who volunteered to participate in the study constituted the sample. Parents were given online "Technology Addiction and Correct Use of Technology: Parental Awareness Training" on January 16, 2024, via Google classroom. Training program was implemented by the clinical psychologist working at a University Psychological Application and Research Center. Before training, 283 parents were reached, and 50 parents participated. The data were collected using the "Individual Descriptive Form, Internet Addiction Scale, and Problematic Media Use Measure".

Data Collection Instrument-Validity and Reliability Information

Individual descriptive form: It was developed by the researcher in line with the literature. It consists of questions to determine the socio-demographic characteristics of individuals (Gaysina & Zakirova, 2017; Kırlioğlu et al., 2023).

Digital Addiction Scale: This scale, developed by Hazar and Hazar was used to measure the level of digital game addiction of 364 students between the ages of 10-14. The scale is of a 5-point Likert type (strongly disagree, disagree, undecided, agree, strongly agree) and consists of 24 items. Scale consists of 4 su-

b-dimensions: excessive focus and conflict on digital game playing (.78), development of tolerance and value attributed to gaming (.81), postponement of personal and social tasks/homework (.76), psychological-physiological reflection of deprivation and immersion in gaming (.67). Total internal consistency coefficient of the scale was .90, and the test-retest correlation coefficient was .81. Scores that can be obtained from scale range from 24 to 120, and range of 1-24 points represents the normal group, 25-48 points represents the low-risk group, 49-72 points represents the risky group, 73-96 points represents the addicted group, and 97-120 points represent the severely addicted group (Hazar & Hazar, 2017). In this study, Cronbach's Alpha value was calculated as .91.

Internet Addiction Scale: Internet addiction scale, originally named "Skala zur Erfassung der Internetsucht", was developed by Hahn and Jerusalem to determine the internet addiction levels of individuals from different age groups (Hahn & Jerusalem, 2001). Scale was adapted into Turkish by Şahin and Korkmaz (Şahin & Korkmaz, 2011). Scale consists of 19 items and three sub-dimensions. Each of the items in the sub-dimensions is scaled as never (1), rarely (2), sometimes (3), usually (4), always (5). First of these sub-dimensions is "loss of control" (7 items; Cronbach's $\alpha=0.90$), second is "desire to stay online more" (4 items; Cronbach's $\alpha=0.88$), and third is "negativity in social relations" (8 items; Cronbach's $\alpha=0.92$). Internal consistency coefficient for the overall scale was .85. Highest total score that can be obtained from this scale is 95, and lowest score is 19. High scores indicate that individuals have high levels of internet addiction. In this study, first of these sub-dimensions was

"loss of control" (Cronbach's $\alpha=.84$), second was "desire to stay online more" (Cronbach's $\alpha=.91$), and third was "negativity in social relationships" (Cronbach's $\alpha=.85$) (Hahn & Jerusalem, 2001; Şahin & Korkmaz, 2011). This scale was used to assess parents' internet use. In this study, Cronbach's Alpha value was calculated as .91.

Problematic Media Use Measure: Scale was developed by Domoff et al. (2017) to identify problematic media use in children aged 4-11 years. Nine-item short form is scored on a 5 point Likert scale, 1 point "never", 5 points "always". Total score is calculated by calculating the mean of the scores obtained from all items. Scale tries to identify the problematic use of all media tools (Domoff et al., 2017). In this study, Cronbach's Alpha value was calculated as .92.

Implementation of Technology Addiction Training Program to Elementary and Middle School Students

Technology Addiction Training Program was delivered by three faculty members working in the a University Department of Pediatric Nursing and four the 3rd-grade students by using face-to-face education techniques. The training program started with introductions, warm-ups, and presentations of the training program. Elementary and middle school students were informed about purpose and process of the project. Student-centered active learning methods such as lecture, discussion, video watching, question-answer, brainstorming, and role-play were used as teaching techniques. Educational materials such as computers, slides, and educational video content related to the subject content were used in the training. Implementation of the training program lasted 2 lessons of 40 minutes. "Digital

Addiction Scale" was applied to elementary and middle school students before and after the training.

Evaluation of the Data

Statistical analyses of the data were performed using IBM SPSS Statistics 22.00 (Statistical Package For Social Science) package software. Descriptive statistical methods such as frequency, percentage, mean, standard deviation, median, and analysis of variance were used in the evaluation of the study data. Shapiro-Wilk test was employed for the analysis of the distribution normality of the data. Paired t-test was used to determine whether there was a difference between the quantitative data before and after the implementation, as there is a normal distribution. Cohen's d effect size was calculated. Results were evaluated at a 95% confidence interval, with a significance level of $p < .05$.

Ethical Aspects of the Research

Ethical permission was obtained from a University Social and Human Sciences Ethics Committee (2023-90), and institutional permissions were obtained from the University Faculty of Health Sciences and Provincial Directorate of National Education of the city. Informed consent was obtained from the students participating in the study and their parents.

RESULT

Mean age of elementary school students was $9.07 \pm .77$ years, mean age of middle school students was $11.64 \pm .87$ years, and mean age of all students was 10.32 ± 1.52 years. It was determined that 59.3% of elementary school students and 84.7% of middle school students had their own mobile phones, while 60.2% of elementary school students and 46.8% of middle school students had their own tablets. In the study, 76.5% of the elementary school students, 42.6% of the middle school students except for homework, stated that they used technological devices for other purposes

for 1-2 hours. In addition, 90.7% of the elementary school students, 75.9% of the middle school students stated that they play online games. It was determined that 59.7% of elementary school students, 26.6% of middle school students, played online games over an hour daily. 89.4% of elementary school students and 94.9% of middle school students used social media (Table 1).

Elementary school students' mean Digital Addiction Scale score before the Technology Addiction Training Program was 41.60 ± 11.56 and 38.18 ± 13.09 after the training. Mean Digital Addiction Scale score of middle school students before Technology Addiction Training Program was 53.51 ± 18.03 and 52.27 ± 20.16 after the training. Mean Digital Addiction Scale score of all students before the training program was 47.42 ± 16.19 and 45.07 ± 18.31 after the training. A statistically significant difference was determined between elementary school students' mean digital addiction scale scores and all students before and after the technology addiction training program ($p < .05$). No statistically significant difference was found between the mean digital addiction scale scores of middle school students before and after the technology addiction training program ($p > .05$) (Table 2).

Table 1. Socio-Demographic Characteristics of Elementary and Middle School Students

Age: X $\pm$ SD (Min.-Max.)		10.32 $\pm$ 1.52 (8-13)			
		Elementary School Students		Middle School Students	
Age: X $\pm$ SD (Min.-Max.)		9.07 $\pm$.77 (8-11)		11.64 $\pm$.87 (8-13)	
		n	%	n	%
Family type	Nuclear	181	80.1	186	86.1
	Extended	45	19.9	30	13.9
Mother's employment status	Employed	123	54.4	97	44.9
	Unemployed	103	45.6	119	55.1
Father's employment status	Employed	214	94.7	188	87.0
	Unemployed	12	5.3	28	13
Technological devices owned by *	Mobile phone	134	59.3	183	84.7
	Tablet	136	60.2	101	46.8
	Desktop PC	84	37.2	60	27.8
	Play station	39	17.3	44	20.4
	Laptop	60	26.5	82	38.0
	Xbox	11	4.9	6	2.8
Duration of use of the technological device for purposes other than homework	1-2 hours	173	76.5	92	42.6
	3-4 hours	36	15.9	71	32.9
	5-6 hours	13	5.8	28	13
	6 hours, more	4	1.8	2	11.6
Online gaming status	Yes	205	90.7	164	75.9
	No	21	9.3	52	24.1
Online gameplay time/min.	60 min.	135	59.7	51	23.6
	61 - 120 min.	56	24.8	70	32.4
	More than 121 min.	35	15.4	95	44
Social media usage status	Yes	202	89.4	205	94.9
	No	24	10.6	11	5.1
Social media usage time	60 min.	154	68.1	97.9	4.2
	61 - 120 min.	45	19.9	79	36.6
	More than 121 min.	27	11.9	31	14.4

*More than one option can be marked.

Table 2. Digital Addiction Scale Mean Scores of Elementary and Middle School Students

Digital Addiction Scale	Before the training X $\pm$ SD (Min-Max)	After the training X $\pm$ SD (Min-Max)	Statistical analysis	
			t p*	Effect size
Elementary school students	41.60 $\pm$ 11.56 (25-90)	38.18 $\pm$ 13.09 (25-125)	3.117 .002	.027
Middle school students	53.51 $\pm$ 18.03 (25-120)	52.27 $\pm$ 20.16 (25-125)	.653 .515	.06
All students	47.42 $\pm$ 16.19 (25-120)	45.07 $\pm$ 18.31 (25-125)	2.173 .030	.13

*p<.05

Mean age of parents who participated in the study was 39.51 ± 5.17 years, 70.3% were female, and 48.1% were undergraduate graduates. Among the parents, 97.2% owned a cell phone, and 41.7% owned a tablet. It was determined that 47.3% of the parents used technological devices for 1-2 hours daily, 37.1% used technological devices for 3-4 hours daily, 38.2% used a family protection program, and 94.7% informed their children about safe internet use (Table 3).

Mean Internet Addiction Scale score of 283 parents who agreed to participate in the study was 24.55 ± 8.39 before the Technology Addiction Training Program. Mean Internet Addiction Scale score of the parents (n=50) who voluntarily participated in the technology addiction training program and received online training was 24.08 ± 7.08 before the training and 24.24 ± 5.96 after the training. There was no statistically significant difference between the mean scores of the Parents' Internet Addiction Scale before and after the online Technology Addiction Training Program ($p>.05$) (Table 4).

The mean Problematic Media Use Measure score of 283 parents who agreed to participate in the study was 17.15 ± 7.97 before the technology addiction training program. The mean Problematic Media Use Measure score of the parents (n=50) who voluntarily participated in the technology addiction training program and received online training was 18.10 ± 8.21 before the training and 18.16 ± 8.81 after the training. There was no statistically significant difference between the mean scores of the Problematic Media Use Measure before and after the online technology addiction training program ($p>.05$) (Table 4).

Table 3. Socio-Demographic Characteristics of Parents

Age: $X \pm SS$ (Min - Max)		39.51 $\pm$ 5.17 (27-60)	
		n	%
Gender	Female	199	70.3
	Male	84	29.4
Educational status of parents	Elementary school	31	11.0
	Middle school	32	11.3
	High school	84	29.7
	Undergraduate	136	48.1
Economic status of the family	Income less than expenses	38	13.4
	Income equivalent to expense	183	64.7
	Income more than expenses	62	21.9
Technological devices owned by*	Mobile phone	275	97.2
	Tablet	118	41.7
	Desktop PC	77	27.2
	Play station	34	12
	Laptop	116	41.0
	Xbox	7	2.5
Duration of use of technological devices	1-2 hours	134	47.3
	3-4 hours	105	37.1
	5-6 hours	29	10.2
	6 hours and more	15	5.3
Online gaming status	Yes	60	21.2
	No	223	78.8
Online gameplay time	1-2 hours	30	50
	3-4 hours	29	48.3
	5-6 hours	1	1.7
Social media usage status	Yes	276	97.2
	No	8	2.8
Social media usage time	1-2 hours	207	73.1
	3-4 hours	53	18.7
	5-6 hours	10	3.5
	6 hours and more	6	2.1
Status of family program usage	Yes	108	38.2
	No	175	61.8
Providing information to the child about safe internet use	Yes	268	94.7
	No	15	5.8

Table 4. Parents' Internet Addiction Scale and Problematic Media Use Measure Mean Scores

	Before training	After training	Statistical analysis	
	X ± SD (Min-Max)	X ± SD (Min-Max)	t p	Effect Size
Internet Addiction Scale				
Total parents n (283)	24.55 ± 8.39 (19-79)			
Parents participating in the training n (50)	24.08 ± 7.08 (19-60)	24.24 ± 5.96 (19-46)	-.114 .909	.02
Problematic Media Use Measure				
Total parents n (283)	17.15 ± 7.97 (9-43)			
Parents participating in the training n (50)	18.10 ± 8.21 (9-43)	18.16 ± 8.81 (9-39)	-.035, .972	.00

*p < .05

DISCUSSION

The present study found that the internet addiction status of the students was close to the moderate level. Literature includes studies reaching different conclusions on this issue. Bilgin (2015) concluded that children in the 10-14 age group are addicted to digital games at a risky level (Bilgin, 2015). In a study with 340 children aged 10-15 years, Gaysina and Zakirova (2017) found that 6th, 7th, and 8th graders had a strong interest in computer games and social networks (Gaysina & Zakirova, 2017). In Demir's study (2024) conducted with 474 children aged 10-13 years, it was determined that the digital game addiction of children was at a mild level (Demir, 2024). Chang et al. (2015) conducted a study with 1808 middle school students and found that 16.26% of them were internet addicts (Chang et al., 2015). In a study, Gül and Özgür (2023) found that 64 (6.1%) of the middle school students were in the "normal", 77 (7.4%) in the "addicted", and 16 (1.5%) in the "severely dependent" groups (Gül & Özgür, 2023). It was determined that among majority of

middle school students, 889 students (85%), 534 (51.1%) were in the "less risky" group and 355 (33.9%) were in the "risky" group. According to the data of the Turkish Statistical Institute "Survey on the Use of Information Technologies by Children", internet use by children in the 6-15 age group was 50.8% in 2013 and 82.7% in 2021 (Turkish Statistical Institute, 2021). Difference in the literature findings is considered to be due to the socio-demographic characteristics of the population in which the studies were conducted. Since childhood is a period in which individuals change and develop physiologically, psychologically, and psychosocially, educational programs for the prevention of internet addiction should be developed in cooperation with teachers, physiologically, psychologically, and psychosocially, educational programs for the prevention of internet addiction should be developed in cooperation with teachers, psychologists, and should be implemented in the early period by encouraging parental participation.

Present study determined that the parents' level

of internet addiction was low. Literature suggests that parents' internet addiction and negative attitudes towards the internet negatively affect their children's technology addiction (Çelikbaş, 2023; Doğan & Döğër, 2023; Yaylacı, 2019). Çelikbaş reported that the level of internet addiction of the child increases with the increase in the level of internet addiction of the mother, and the level of internet addiction of the child would decrease when the level of internet addiction of the mother is low (Çelikbaş, 2023). Yaylacı, examined the effects of the internet on the parent-child relationship and concluded that there is a positive relationship between the parent's internet use and the child's internet use (Yaylacı, 2019). Doğan and Döğër examined the relationship between parent and child internet addiction and concluded that there was a significant relationship between the time spent by the mother on technological devices and the time spent by her child on technological devices (Doğan & Döğër, 2023). Neverkovich et al. found that the interpersonal relations of students identified the prevalence of non-structural relationship types with the people around them, and this influenced the development of addiction to social networks (Neverkovich et al., 2018). Training programs in which parents are informed about both their individual use and their children's safe use of technology are needed.

Present study determined that, from the parents' perspective, their children's problematic media use was moderate. Kırloğlu et al. found that parents' problematic media use scale scores differed significantly according to the gender of their children, 56.92 ± 23.50 for girls and 59.44 ± 24.31 for boys, and both were at a moderate level (Kırloğlu et al., 2023). It is considered that determining the levels of technology addiction from the children's and parents' perspectives will provide more objective findings. In the study, children reported that their digital addiction status was close to mo-

derate, while from the parents' perspective, their children's problematic media use status was also determined to be close to moderate. Parents' and children's assessments are consistent. It is considered that knowing the evaluations of both parties, as in this study, will guide the creation of the content of the training programs.

Present study found that the "Technology Addiction Training Program" applied to elementary and middle school students positively affected the digital addiction levels of students. Elementary school students' digital addiction levels decreased after the training program. However, it was determined that the "Technology Addiction Training Program" applied to middle school students did not affect their digital addiction levels. When all students were evaluated, it was determined that the training program positively affected their digital addiction levels and their scores decreased after the training. Erses and Müezzın determined that the "Human Values Psychoeducation Program", which includes the subject of problematic internet use, reduced the internet use of high school students and enabled individuals to use information and communication technologies responsibly without harming others (Erses & Müezzın, 2018). In the study of Gaysina and Zakirova, a 5-lesson program consisting of developmental and educational activities was applied to children aged 10-15 to prevent internet addiction. At the end of this program, it was determined that the students' strong interest levels in computer games and social networks decreased slightly, and their ability to control their daily internet usage time improved (Gaysina & Zakirova, 2017). The results of the present study are similar to the study conducted by Gaysina and Zakirova on the digital addiction levels of middle school students. Studies indicate that as children's age increases, their internet use, social media use, and computer game playing status also increase (Gaysina & Zakirova, 2017; Kırloğlu et al., 2023).

In a 12-week strategic physical activity intervention, school-aged children were studied by Tseng et al. Results showed that a well-designed physical activity program could be an effective behavioral strategy to help children who are hooked to digital devices with their motor and cognitive skills (Tseng et al., 2022). Furthermore, on 42 teenagers who were addicted to the internet, Gong et al. assessed the impact of story therapy in conjunction to eight repetitions of Pilates exercises (Gong et al., 2022). There was a statistically significant difference between the adolescents in the intervention group and the control group before and after the intervention, indicating that the former had less Internet addiction than the latter. The intervention group also demonstrated a statistically significant improvement in the score for positive affect through pre-post comparison. Another study supports the effectiveness of educational intervention based on the health belief model to prevent and decrease mobile phone addiction (Khoshgoftar et al., 2019). Uysal and Balci suggest that the Healthy Internet Use Program decreases the rate of Internet addiction among adolescents (Uysal & Balci, 2018). In this study, the possible reasons why the effect of the program on secondary school students was lower than expected are primarily the age-related cognitive and attention development level. For example, pre-adolescent students are still in the developmental process in terms of executive functions and attention span (e.g., one study found that executive functions interact with age and puberty level (Porter et al., 2024). Secondly, today's students' high levels of technology and screen exposure may create difficulties in attracting and sustaining their attention to traditional face-to-face educational content; for example, high screen time has been negatively associated with academic performance (Sampasa-Kanyinga et al., 2022). Thirdly, the activity duration and content format may not have been designed to sustain the attention

of middle school students, who may have short attention spans. These findings serve a critical function for school nursing practices implementing education-supported health programs. School nurses should prefer models that are age-level appropriate, consider executive functions and attention characteristics, and integrate digital tools or interactive methods (Türk & Ergin, 2021). In addition, parental awareness should be increased because managing screen time in the home environment can support students' level of attention and engagement with the program. The unique contribution of this study is to identify many factors that limit program effectiveness at the middle school level. By considering multifaceted factors (age/cognitive development, attention span, and exposure to technology) together, it demonstrates that school-based health education should go beyond simply conveying content and seek answers to the question, "for whom, with what method?" Thus, it offers not only the transfer of factors mentioned in the literature but also implications for the implementation-design phase specifically for secondary schools.

The study's unique aspect is that university students, through their "peer education" role, serve as role models for younger age groups, while simultaneously strengthening child-parent digital awareness through the online education process for parents. This two-way approach offers a holistic model that engages not only children but also parents in the fight against technology addiction. The findings highlight the importance of school nurses integrating peer education models and parental engagement supported by digital tools into their education planning.

Limitations

This research has some limitations. Post-training tests were administered immediately, but no follow-up tests were conducted. This creates a limi-

tation in terms of the permanence of the findings. In other studies, performing the final tests again after a period of time is recommended. A control group was not created in this study. The primary reason for this was that it was impossible to change the existing structure of the educational institutions where the program was implemented, and it was ethically unacceptable to deprive a group of similar students of education. However, a pre-test and post-test were administered to check the students' initial levels and demonstrate the process of change after the training. This partially mitigated the impact of the lack of a control group. While this could be considered a limitation of the study, it is valuable in demonstrating the changes observed after the program. Additionally, only some of the parents who attended the pre-test attended the training.

CONCLUSION

Since technology is an inevitable reality of our age, the correct use of the internet and digital technologies is becoming important. It is considered that including protective and preventive content regarding the dangers and risks children may encounter in digital environments in the course curriculum will be effective in preventing or reducing internet addiction. In conclusion, a technology addiction education program conducted with the active participation of university students increased digital awareness at the primary school level and was effective in reducing internet addiction levels. Conducting parent education online contributed to increased awareness, but it was determined that longer-term or interactive interventions were needed to achieve meaningful behavioral change. An innovative aspect of the study was the simultaneous planning of child and parent education programs and the inclusion of university students in the process through a peer education model. This approach constitutes a sustainable example for increasing digital health literacy and preventing

technology addiction in school nursing practice. In addition, training needs to be planned by school nursing to increase the digital awareness of children and parents simultaneously.

Training to parents were important to keep their children away from the dangers of the digital environment. Parents should check the digital games they play and the cartoons they watch, watch them together if necessary, and closely monitor the websites they use. Parents should limit their children's screen time and frequently check the applications installed on their phones or tablets.

At the policy level, collaboration between the Ministry of National Education and universities is recommended for the national dissemination of peer-based digital awareness programs.

More comprehensive experimental studies are needed in this area. Further studies examining the effectiveness of different educational methods, motivational speeches, role-playing games, video watching, brainstorming, etc. in preventing internet addiction are needed.

Information

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The authors declare no potential conflicts of interest with respect to the contributing research, authorship, and publication of this article.

Conception: HU, Desing: HU, MK, ETB, Supervising: HU, MK, ETB, Financing and equipment: HU, MK, ETB, Data collection and entry: HU, MK

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