

The Effect of Digital Literacy Program on Digital Addiction Tendency in Infants and Digital Burnout in Parents

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Abstract

The aim of the present study is to examine the effect of the Digital Literacy Program on infants' digital addiction tendency and parents' digital burnout. The quantitative dimension of the study, which was designed as a mixed design, consists of an experimental design with pretest, posttest, and permanence test control group. In the qualitative dimension of the study, the views of parents were examined by using the "Semi-structured Interview Form" prepared for parents. The study was conducted with 40 parents (15 in the experimental group and 25 in the control group) with infants aged between 6 and 36 months. Personal Information Form, Infant Digital Addiction Tendency Scale, and Digital Burnout Scale were used as data collection tools. Parents in the experimental group received 12 sessions of digital literacy training, while parents in the control group did not receive any training. After the implementation of the digital literacy training program, a significant decrease was observed in the digital burnout levels of the parents in the experimental group, as well as in the digital addiction tendency of the infants ($p < 0.05$). The digital literacy program was found to have a positive effect in reducing parents' digital burnout and infants' digital addiction tendencies. In addition, qualitative findings indicated that most parents reported changes in their digital device use, perceived contributions of the program to their infants' developmental process, and alterations in infants' interactions with digital tools after the program.

Keywords: *Digital addiction, Digital burnout, digital literacy, infancy.*

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Dijital Okuryazarlık Programının Bebeklerde Dijital Bağımlılık Eğilimine ve Ebeveynlerde Dijital Tükenmişliğe Etkisi

Öz

Bu çalışmada, Dijital Okuryazarlık Programının bebeklerde dijital bağımlılık eğilimine ve ebeveynlerde dijital tükenmişliğe etkisinin incelenmesi amaçlanmıştır. Karma desen olarak tasarlanan araştırmanın nicel boyutunu; ön test, son test ve kalıcılık testi kontrol gruplu deneysel desen oluşturmaktadır. Araştırmanın nitel boyutunda ise, ebeveynlere yönelik hazırlanan “Yarı Yapılandırılmış Görüşme Formu” uygulanarak ebeveyn görüşleri incelenmiştir. Çalışma, 6-36 aylık bebeği olan 40 ebeveyn (15 deney grubu, 25 kontrol grubu) ile yürütülmüştür. Veri toplama aracı olarak kişisel bilgi formu, bebekler için dijital bağımlılık eğilimi ölçeği ve dijital tükenmişlik ölçeği kullanılmıştır. Deney grubunda yer alan ebeveynlere 12 oturumluk dijital okuryazarlık eğitimi uygulanırken, kontrol grubunda yer alan ebeveynlere herhangi bir uygulama yapılmamıştır. Dijital okuryazarlık eğitim programının uygulanmasının ardından, deney grubundaki ebeveynlerin dijital tükenmişlik düzeylerinde ve bebeklerin dijital bağımlılık eğilimlerinde anlamlı bir azalma olduğu saptanmıştır ($p < 0.05$). Dijital okuryazarlık programının ebeveynlerin dijital tükenmişliğini azaltmada ve bebeklerin dijital bağımlılık eğilimini düşürmede olumlu bir etkisi olduğu sonucuna ulaşılmıştır. Ayrıca nitel bulgular, ebeveynlerin büyük çoğunluğunun dijital araç kullanımında değişiklikler yaşadığını, programın bebeklerinin gelişim sürecine katkı sağladığını ve program sonrasında bebeklerinin dijital araçlarla etkileşimlerinde farklılıklar gözlemlediklerini ortaya koymuştur.

Anahtar Kelimeler: *Bebeklik, dijital bağımlılık, dijital okuryazarlık, dijital tükenmişlik.*

INTRODUCTION

As living spaces are surrounded by digital tools and people of all ages have access to and use them, digital tools are seen as a part of everyday life. In addition to improving the standard of living and providing a number of benefits, the increased use of digital tools also creates a basis for a number of risks and concerns. Among these risks, the concept of “addiction” is considered the most common in the literature (Çimke et al., 2023; Boğa Baran & Sağlam, 2023). Digital addiction is used to define the effect and relationship of digital tools and digital environments such as computers, televisions, tablets, and social media on individuals (Young, 2009). The concept of digital addiction, which increases in frequency with the intensive and excessive use of digital tools, becomes a more serious problem in the early years of life and during periods of very sensitive development. Many studies in the literature emphasize that infants in the age range of 0-3 years encounter and interact with digital tools very early (Boğa & Sağlam, 2021; Almourad, 2020; Danby et al., 2018; Günüç & Atlı, 2018; Samaha & Hawi, 2017; Ferrara et al., 2017). Screen use that exceeds two hours per day for the children in this age range is considered excessive and becomes a risk factor for addiction (Downing et al., 2017). A review of the literature shows that the age of encounter with digital tools falls below the age of five, with an average of three hours of digital games played per day (Mustafaoğlu & Yasacı, 2018). In another study, 92% of infants participating in the study started using mobile devices before the age of one (Kabali et al., 2015). In another study, 31.9% of infants between the ages of 7 and 12 months were introduced to television and 30.2% were introduced to smartphones (Durmuş & Övür, 2021); and in the study conducted by Wartella et al. (2013), it was concluded that 38% of infants under the age of two were introduced to digital tools. These findings are considered as an important phenomenon that needs to be addressed in terms of acquiring some habits that will shape the way digital tools are used in the later years of life.

While the use of high-quality educational and interactive digital tools can be seen as beneficial, overuse and early age of use can also pose various risks (Anitha, 2021). Increased screen use, especially at a young age (Poulain et al., 2018), can create a foundation for addiction. In this case, the duties and responsibilities of parents can be considered as an important factor in this

process. In fact, infants spend most of their time with their parents, especially in the first years of their life. Therefore, the way parents use digital tools has a significant impact on the way infants use digital tools. When related studies are examined, it is found that parents' use of digital tools and infants' use of digital tools are interrelated (Domoff et al., 2019; Poulain et al., 2019; Zhao et al., 2018; Downing, 2017). The process of digital dependency tendency is shaped by parents' digital awareness, their guidance, and the environment they provide for their children. Although there are studies in the literature that argue that the process of digital literacy develops automatically with early exposure to digital tools (List, 2019), infancy is seen as a time when parents or caregivers are fully responsible for the ability to control digital tools and environments. In fact, there are studies that show that parents' use of technology influences the behavior of 18-24 month old infants (Atlı et al., 2019).

Parents, who have the primary responsibility for interacting with digital tools during infancy, shape infants' interactions with digital tools (Haake, 2015). As a matter of fact, the studies conducted during this period have generally relied on the opinions of parents. In one of these studies, mothers stated that it is not possible to keep infants away from digital tools in the digital age and that infants are interested in digital tools (İşıkoğlu & Ergenekon, 2021). Another study suggests that infants' interactive use of digital tools with their parents can benefit infants by supporting them to learn something new from digital tools (Hipp et al., 2017). While the present study emphasizes that digital tools can provide advantages or disadvantages depending on how they are used, it also mentions the importance of the parents' position in the digital addiction process. In fact, the family factor is considered as an important factor in studies investigating digital addiction in the literature (Aküzüm et al., 2022; Aydoğdu, 2021; Yiğit & Günüş, 2020; Ólafsson et al., 2018). Thus, the family is considered to be an important factor in the formation of digital addiction tendencies of the children in their early childhood. Accordingly, the creation of awareness development of awareness on the use of digital tools by parents through a digital literacy program for parents can indirectly influence infants' use of digital tools.

Social learning theory emphasizes the power of observation in learning and argues that parents are important references in shaping infants' behavioral patterns (Brauer & Tittle, 2012). Infants observing their parents begin to form the first foundations of digital literacy (Kalan, 2010). At this point, the digital literacy level of parents becomes an important factor in the way infants use digital tools (Kumbaraoğlu, 2023). It has been found that parents with high digital literacy levels are more competent in managing their infants' use of digital tools (Özek, 2016). Thus, it is expected that the digital literacy program to be prepared within the scope of the present study will affect the tendency of digital addiction among young children.

The way parents use digital tools has an impact on the emotional state of parents as well as different developmental areas of infants (Gür & Türel, 2022; Meng et al., 2020; Lissak, 2018). Digital burnout can be observed in individuals who spend most of their time with digital tools, especially when they spend intensive time in the virtual environment (Erten & Özdemir, 2020). Continuous mental preoccupation after spending time with digital tools and continuous thinking about digital experiences lead to mental fatigue, and this situation turns into burnout over time (Chang, 2016). Especially, symptoms such as stress, fatigue, insensitivity to the environment, and loss of interest are considered the main indicators of digital burnout (Erten & Özdemir, 2020). In this case, the development of digital literacy skills in individuals gains significance. A digitally literate individual also has the ability to adapt to digital life and control digital processes. Thus, it is assumed that a digital literacy program to be prepared for parents will have an effect on digital burnout in parents in addition to as well as digital addiction tendency in children.

In the digital age, changes and transformation in the roles and responsibilities of parents are inevitable. The correct management and control of digital tools and digital environments that surround daily life is related to the ability of parents to support the development process of infants in a healthy way. In this direction, with the development of digital literacy skills in parents, it is thought to prevent the formation of digital addiction tendency in infants in the early years of life. In addition, digital literacy is considered important in preventing digital burnout in parents and minimizing its negative effects. Considering all

these contexts, it is important to develop digital literacy skills in parents. In this regard, the present study seeks to address the following research questions:

- 1) Is the digital literacy training program effective in reducing parents' digital burnout?
- 2) Is the digital literacy training program effective in decreasing infants' digital addiction tendencies?
- 3) How do parents' digital awareness and guidance shape their infants' interactions with digital tools?
- 4) What are parents' experiences and perceptions regarding the contributions of the digital literacy program to their infants' developmental process?"

METHOD

This section includes the research model, study group, data collection tools, data collection, data analysis and the ethical considerations of the study.

Research model

The current study, which examined the effect of a digital literacy program on infants' digital addiction tendencies and parents' digital burnout, was designed as a mixed design, using quantitative and qualitative data together. In a mixed design research, it is essential to use quantitative and qualitative methods together (Johnson & Christensen, 2014; Creswell & Clark, 2014). In the quantitative dimension of the study, a quasi-experimental design with pretest, posttest, and permanence test control group was applied. In the qualitative dimension, the application was carried out through a semi-structured interview form prepared for parents. Before the experimental study and after the implementation of the digital literacy program, the "Digital Addiction Tendency Scale for Infants" and the "Digital Burnout Scale" were administered to the parents in the experimental and control groups as pretest and posttest. In order to qualitatively examine the parents' views, interviews were conducted with the parents using the "Semi-structured Interview Form" prepared for the parents. In addition, a permanence test was administered to the parents in the experimental group two weeks after the posttest.

Study Population

The population of the study consists of parents who live in Diyarbakır city center and have infants aged 6-36 months. There are 40 parents in the sample who were selected by convenience sampling method, which is one of the non-random sampling methods. Convenience sampling is preferred in sample groups consisting of easily accessible people who voluntarily participate in the study (Johnson & Christensen, 2014). In this direction, an announcement about the study was made through social media tools. The parents who responded to the announcement about the study were interviewed and informed about the study, and the parents who wanted to participate in the study were included in the sample group. The study was started at Anatolia Art Center with 50 parents participating in the study, 25 in the experimental group and 25 in the control group. However, the study was completed with a total of 40 participants, (15 in the experimental group and 25 in the control group) since 10 participants dropped out of the training and left voluntarily during the implementation process.

Table 1. *Frequency and Percentage Distributions of Demographic Characteristics of Participants in the Experimental and Control Groups*

Demographic Characteristics	Experimental Group: n=15		Control group: n=15	
	f	%	f	%
Parent completing the questionnaire				
Mother	14	93.3	20	80.0
Father	1	6.7	5	20.0
Age of the infant				
6-12 months	-	-	6	24.0
13-18 months	3	20.0	7	28.0
19-24 months	3	20.0	4	16.0
25-30 months	5	33.3	5	20.0
31-36 months	4	26.7	3	12.0
Sex of the infant				
Girl	8	53.7	15	60.0
Boy	7	46.7	10	40.0

Age of the parents				
18-25	1	6.7	2	8.0
26-30	5	33.3	5	20.0
31-35	4	26.7	12	48.0
36-40	4	26.7	5	20.0
41 years and older	1	6.7	1	4.0
Number of children				
One child	4	26.7	18	72.0
Two children	8	53.3	5	20.0
Three children	3	20.0	2	8.0
Education level				
High school graduate	4	26.6	4	16.0
Associate's degree graduate	1	6.7	2	8.0
Bachelor's degree	10	66.7	16	64.0
Graduate of postgraduate studies	-	-	3	12.0
Socioeconomic level				
My income is less than my expenses	6	40.0	4	16.0
My income is equal to my expenses	7	46.7	13	52.0
My income is more than my expenses	2	13.3	8	32.0
Mother's employment status				
Working	7	46.7	16	35.6
Not working	8	53.3	9	20.0
Father's employment status				
Employed	15	100.0	24	96.0
Non-employed	-	-	1	4.0
Total	15	100.0	25	100.0

When the demographic characteristics of the parents in the population were examined, it was observed that the majority of the participants were mothers, the majority of the infants were between 25 and 30 months, the sex distribution of the infants was close to each other (Girl: 53.7%, Boy: 46.7%),

the age of the parents was mostly between 26 and 30 years in the experimental group and 31-35 years in the control group, the parents in the experimental group mostly had two children, while the control group had more parents with one child. It was concluded that the parents in both the experimental and control groups were mostly undergraduate graduates, income and expenditure of these parents were equal in terms of income level, and the majority of the parents participating in the study were employed.

Data Collection Tools

In the study, the “Personal Information Form” prepared by the researcher was used to determine the demographic characteristics of parents. Besides, the “Digital Addiction Tendency Scale for Infants” was used to assess the digital addiction tendency of infants while the “Digital Burnout Scale” was used to assess the digital burnout of parents. After the program was implemented, the “Semi-structured Interview Form” prepared by the researcher was used to examine the views of the parents participating in the study. In addition, an “Informed Consent” form was prepared for each parent participating in the study, and it was explained that voluntary participation in the study was essential, that they could leave the study at any time they wanted after starting the study, and that they would not face any negative attitudes or consequences in this case.

Personal Information Form

The Personal Information Form prepared by the researcher was used to determine the demographic characteristics of the parents with 6-36-month-old infants in the study group. In the personal information form; questions such as age, number of children, educational status, employment status, income level were asked for the parents.

Digital Addiction Tendency Scale for Infants

The Digital Addiction Tendency Scale for Infants was developed by Boğa-Baran and Sağlam (2023). The scale has one dimension and 21 items. There are no reverse items in the scale. The items in the scale are completed by the parents. The Likert-type scale includes the options “5-Always”, “4-Mostly”, “3-Sometimes”, “2-Rarely”, “1-Never”. The Cronbach's alpha coefficient of the

scale was calculated to be 0.932. The lowest score that can be obtained from the scale is 21 and the highest score is 105. As the total score obtained from the scale increases, the tendency to digital addiction increases.

Digital Burnout Scale

The Digital Burnout Scale was developed by Erten and Özdemir in 2020 to determine the level of digital burnout. The scale includes 24 items in total and 3 sub-dimensions as “digital addiction”, “digital deprivation” and “emotional exhaustion”. The Likert-type scale includes the options of “5-Totally agree”, “4-Agree”, “3-Partially agree”, “2-Disagree”, “1-Never agree”. The Cronbach alpha coefficient was found to be 0.946 and it was concluded that the scale is valid in terms of item content and construct validity. There are no reverse-coded items. The total score indicates the level of digital burnout, with higher scores reflecting higher digital burnout.

Semi-structured Interview Form

The Semi-Structured Interview Form, prepared by the researcher, was designed to obtain participants' evaluations of the digital literacy program. Finalized with expert opinions, the form focused on parents' perceptions regarding the contributions of the program to themselves and to their infants' developmental processes, as well as the changes observed in their own digital device usage and in their infants' interactions with digital tools following the program. In addition, participants were asked to share their views about the overall program, the activities included, and the educator who implemented the training.

Data Collection

Before collecting the research data, the necessary permissions were obtained for the “Digital Burnout Scale”, one of the scales to be used in the research. Then, the necessary permissions were obtained from the institutional authorities for the implementation site of the training program. Before starting the digital literacy training program, 20-30 minute interviews were conducted with the parents and pretest forms were administered. After the pretests were administered, the digital literacy training program was applied to the parents

in the experimental group, while no training was given to the parents in the control group.

Digital Literacy Training Program

The digital literacy training program was planned and implemented in a total of 12 sessions, each session lasting 45 minutes. The researcher prepared the training venue and training materials before the sessions and informed all participants one day before the training. After the digital literacy training program was completed, posttest forms were administered to the parents who participated in the study. Two weeks after the completion of the training program, permanence test data were collected.

The digital literacy program used in the study group is a program prepared for parents who have at least a primary school education, have not received any digital literacy training before, and have an infant aged 6-36 months. Since the digital literacy program was prepared according to the interests and needs of the parents, it was based on experience-centered design from learner-centered design models. The digital literacy program, which is based on raising parents' awareness of infants' early use of digital tools and increasing their level of awareness, is based on the concept of digital parenting. The 21st century, characterized as the digital age, has made the use of the Internet in various aspects of life a basic human need (Yusuf et al., 2020). As a result of this situation, the inclusion of digital media in the daily life of families affects parenting styles and brings the concept of digital parenting to the agenda (Clark, 2013). Digital parenting is considered as a multi-meaning concept that regulates parents' relationship with digital media and highlights how they incorporate digital media into their daily activities and parenting practices (Mascheroni et al., 2018). In general, the concept of digital parenting consists of the dimensions of digital literacy, awareness, control, ethics, and innovation (Yurdakul et al., 2013). Digital literacy program activities also target the achievement of these dimensions. Thus, activities for the digital literacy dimension were presented in the first, ninth, and tenth weeks; activities for the awareness dimension in the third, fourth, and fifth sessions; activities for the control dimension in the sixth and eighth sessions; activities for the innovation dimension in the

second and seventh sessions; and finally activities for the ethics dimension were presented in the third session.

The digital literacy training program, which is based on raising parents' awareness about infants' early use of digital tools, is also based on Bronfenbrenner's bioecological theory, which emphasizes the impact of the child's interaction with his or her environment on development. (Vélez-Agosto et al., 2017). The bioecological model generally examines the factors that directly or indirectly affect the child's development process by considering them in layers (Doğan, 2014). The family, which is one of the directly effective elements in the child's development process and in the first 42 layers surrounding the child, is located in the section called microsystem. The family in the microsystem has a direct impact on the child's development with situations such as parents' attitudes, family communication characteristics, and parents' psychological states (Cook & Kilmer, 2010). Since the digital literacy program is prepared for parents, its theoretical basis is the bio-ecological theory.

In the preliminary stage of preparing the digital literacy program for parents of 6-36 month old infants, the first step was to conduct a needs analysis. The researcher prepared a semi-structured interview form and conducted a needs analysis. The forms obtained after the interviews with a total of 20 parents were analyzed using content analysis techniques. The participants were required to indicate the problem situations with a reliability rate of 70% (Büyüköztürk et al., 2014). In this direction, the situations in which at least 14 out of 20 parents reported problems were taken as the basis for the preparation of the program. The objectives and outcomes of the program were also created in accordance with the identified needs. The sessions covered themes such as the concept of digital literacy, the impact of digital tools on infants' development, digital security and social media use, challenges in feeding, soothing, and sleeping routines, as well as providing developmental support without overreliance on digital devices. In addition, activities were designed to encourage parents to critically reflect on their media practices, such as role-plays ("The Journey of Soothing Babies"), puppet shows, storybook analysis, and discussions about the positive and negative aspects of digital tools. The final session was dedicated to the evaluation and closure of the program.

During the preparation of the digital literacy program, previously implemented digital literacy programs, training programs prepared for parents (EBADER, OBADER), academic studies (theses, articles and books) conducted to study infants' relationship with digital tools were studied. After reviewing the literature, a draft digital literacy program was prepared using the relevant literature and submitted to expert opinion. The final version of the program was created according to the feedback of 8 experts in the fields of child development, preschool education, educational science, information technology and psychology.

Data Analysis

The aim of the present study is to examine the effect of the Digital Literacy Training Program on infants' digital addiction tendency and parents' digital burnout. A pretest, posttest, experimental-control group design was created in accordance with the established purpose. Before deciding on the tests to be used for the analysis, the distributions of the scores of the participants in the experimental and control groups before and after the experimental procedure were examined to determine whether the score distributions met the homogeneity assumption and whether they showed a normal distribution. The skewness and kurtosis values of the pretest, posttest, and permanence test scores were examined to test for normal distribution in both the experimental and control groups. The fact that the ratio of these coefficients to their standard errors was between -1.96 and +1.96 was considered evidence that the data were normally distributed. Levene's test was used to interpret the homogeneity assumption of the data. When the test results were analyzed, it was found that the significance value was greater than 0.05, that is, there was no significant difference between the variances of the scores. Therefore, it can be said that the variances meet the homogeneity assumption. Since the data were normally distributed and the assumptions provided for homogeneity, a two-factor ANOVA for mixed designs, which evaluates within-group, between-group, and between-group effects together, was applied between the pretests and posttests to evaluate the effect of the experimental procedure. In cases where there was a significant difference between the experimental and

control groups in the pretests, ANCOVA analysis was used to eliminate the pretest effect.

Table 2. Descriptive statistics of the scores obtained from the scales

	Test	Group	N	\bar{X}	S. Deviation	Min.	Max.	Mult.	Bas.
Digital aging	Experiment	Pretest	15	30.40	7.37	21	43	0.75	-0.95
		Posttest	15	20.40	2.87	15	26	-0.13	0.05
		Permanence	15	19.00	2.70	15	23	0.20	-1.07
	Control	Pretest	25	27.40	8.57	13	41	-0.23	-0.97
		Posttest	25	26.56	8.85	12	45	0.13	-0.49
	Digital deprivation	Experiment	Pretest	15	15.00	4.75	6	23	0.14
Posttest			15	10.13	2.00	7	14	-0.09	-0.40
Permanence			15	10.13	2.72	6	14	0.21	-1.21
Control		Pretest	25	11.08	3.39	6	16	-0.32	-1.21
		Posttest	25	11.36	3.85	6	23	0.65	1.19
Emotional exhaustion		Experiment	Pretest	15	14.53	4.29	7	22	-0.31
	Posttest		15	10.67	1.50	8	13	-0.52	-0.44
	Permanence		15	10.47	2.29	7	14	0.40	-0.95
	Control	Pretest	25	13.00	4.73	6	22	0.27	-0.64
		Posttest	25	14.44	5.05	7	28	0.85	0.85
	Digital burnout	Experiment	Pretest	15	59.93	13.17	37	88	0.34
Posttest			15	41.20	4.31	33	48	-0.27	-0.35
Permanence			15	39.60	6.09	31	50	0.19	-0.96
Control		Pretest	25	51.48	14.61	26	72	-0.40	-1.08
		Posttest	25	52.36	16.50	28	96	0.54	0.45

Digital addiction tendency	Experiment	Pretest	15	48.00	17.82	27	80	0.71	-0.69
		Posttest	15	33.07	9.28	21	52	0.59	-0.49
		Permanence	15	31.40	8.80	21	49	0.80	-0.53
	Control	Pretest	25	37.72	16.57	23	90	0.20	1.38
		Posttest	25	37.72	15.40	24	84	0.21	1.23

Experimental group: Skewness standard error: 0.580; Kurtosis standard error: 1.121
Control group: Skewness standard error: 0.464; Kurtosis standard error: 0.902

It is better to explain these concepts (digital aging, digital deprivation, emotional exhaustion, digital burnout, digital addiction tendency) which are analyzed within the framework of the scales. In addition, it is better to put the DATSI and DTT scales in the annex to make a better evaluation of the outcomes of the present research.

When the descriptive statistics in Table 2 were examined, it was found that the distributions of the scores obtained from the DATSI and DTT scales and the sub-dimensions of the DTT scale in the experimental and control groups were normal. Therefore, the unpaired t-test was used to test whether the scores of the participants in the experimental and control groups were statistically different before the experimental procedure. To examine the effectiveness of the experimental procedure, the two-factor ANOVA method was used to examine whether the group measurement effect showed a statistically significant difference. To examine the durability of the experimental procedure, only the change in pretest, posttest, and permanence scores in the experimental group was examined using the ANCOVA test for repeated measures.

Ethical Considerations of the Study

In order to start the study, ethics committee approval (put it in the annex) was obtained from Dicle University Social and Human Sciences Ethics Committee. Permission to use the scale was obtained via e-mail after contacting Assoc. Prof. Dr. Pinar ERTEN. The parents participating in the study were informed that the data would be used only for research purposes and that they had the right to leave the study at any time. Informed consent

form was given to the parents who voluntarily agreed to participate in the study and consent was obtained.

FINDINGS

This section presents the findings of the quantitative and qualitative data obtained within the scope of the study.

Findings for Quantitative Data

Findings Before Experimental Procedure

As part of the research, the results of the unpaired sample t-test, which was used to examine whether the pretest scores of the participants in the experimental and control groups on the DATSI (Digital Addiction Tendency Scale for Infants) and DBS scales and the subdimensions of the DBS scale differed according to the experimental and control groups, are shown in Table 3.

Table 3. *The results of the t-test for examining the difference between the pretest scores of the DATSI and DBS scales and the sub-dimensions of the DBS scale according to the experimental and control groups.*

T test	Group	N	Mean	df	t	p
Digital aging	Experiment	15	30.4000	38	1.12	0.27
	Control	25	27.4000			
Digital deprivation	Control	15	15.0000	38	3.04	0.00*
	Experiment	25	11.0800			
Emotional exhaustion	Control	15	14.5333	38	1.03	0.31
	Experiment	25	13.0000			
Digital burnout	Control	15	59.9333	38	1.84	0.07
	Experiment	25	51.4800			
Digital addiction	Control	15	48.0000	38	1.85	0.07
	Experiment	25	37.7200			

When the results of the unpaired sample t-test in Table 3 are examined, it can be seen that the pretest scores of digital aging, emotional exhaustion,

digital burnout, and digital addiction of the participants in the experimental and control groups do not have a statistically significant difference ($p>0.05$). According to this result, it can be said that the pretest scores of digital aging, emotional exhaustion, digital burnout, and digital addiction are similar between the experimental and control groups. As a result, it can be interpreted that the participants in the experimental and control groups have similar characteristics in accordance with the identified characteristics.

Findings Regarding the Effectiveness of the Experimental Procedure

Table 4. ANOVA analysis results for the pretest and posttest of the total digital burnout scores of the experimental and control groups.

Participant	Variance Source	KT	Sd	KO	F	p
	Intergroup					
	Group (Experimental-Control)	34.34	1	23.52	0.11	0.75
Digital	Error	12126.55	38	319.12		
burnout	Intragroup					
total score	Measurement (Pretest-Posttest)	1494.10	1	1494.10	25.59	0.00*
	Group*Measurement	1803.20	1	1803.20	30.88	0.00*
	Error	2218.79	38	58.40		

When the analyses conducted to determine the effect of the training program on the total digital burnout scores of the participants in Table 4 are examined, it is seen that the group*measurement joint effect of the pretest and posttest factors in the experimental and control groups on the total scores of the parents participating in the study can be considered significant in statistical interpretation ($F_{\text{group*measurement}(1-38)}=30.88$; $p=0.00$; $p<0.05$). Based on this result, it has been shown that the applied training program is effective and that implementing activities related to digital literacy training and not implementing any activities have different effects on the participants' digital burnout total scores. Looking at the change in the mean scores of the total digital burnout scores (Experimental_{posttest-pretest} = -18.73; Control_{posttest-pretest} = -0.88), it was seen that the decrease in the total digital burnout scores of the participants in the experimental group was higher than the participants in

the control group. Therefore, it can be said that the Digital Literacy Training Program activity had a positive effect on the total scores of the participants' digital burnout.

Table 5. *Results on the permanence of the effect of the applied experimental process on digital burnout total scores.*

Participant	Variance Source	KT	Sd	KO	F	p	Difference
Digital burnout	Measurement	3834.71	2	1917.36	33.51	0.00*	Permanence, Posttest > Pretest
	Error	1601.96	28	57.21			

When the ANOVA results for repeated measures in Table 5 were examined, it was found that the total pretest, posttest, and permanence scores of the participants in the experimental group showed a statistically significant difference ($F_{\text{group*measure}(2-28)}=33.51$; $p=0.00$; $p<0.05$). According to the result of the post hoc test conducted to determine the source of the difference, it was concluded that the source of the difference was between the permanence and pretest scores and the permanence and posttest scores, and the permanence and posttest scores were similar. In other words, the experimental process applied to the participants continued to have an effect after the experimental process was completed.

Table 6. *ANOVA analysis results for the pretest and posttest of the total digital addiction tendency scores of the experimental and control groups*

Participant	Variance Source	KT	Sd	KO	F	p	
Digital addiction tendency total score	Intergroup						
	Group (Experimental-Control)	148.40	1	148.40	0.34	0.57	
	Error	16738.55	38	440.49			
	Intragroup						
	Measurement (Pretest-Posttest)	1045.33	1	1045.33	33.03	0.00*	
	Group*Measurement	256.72	1	256.72	8.12	0.007*	
Error	1202.47	38	31.64				

Looking at the analyses conducted to evaluate the effect of the applied educational program on the total scores of the participants' digital addiction tendency, it was found that the group*measure effect of the pretest and posttest factors in the experimental and control groups on the total scores of the parents' digital addiction tendency in the application was statistically significant ($F_{\text{group*measurement}(1-38)}=33.03$; $p=0.00$; $p<0.05$). According to this result, it was shown that the experimental procedure was effective, implementing the Digital Literacy Training Program activity and not implementing any activity had different effects on the participants' total scores of digital addiction tendency. When the change in the total scores of digital addiction tendency was examined ($\text{Experiment}_{\text{posttest-pretest}}=-14.93$; $\text{Control}_{\text{posttest-pretest}}=0.00$), it was seen that the decrease in the total scores of digital addiction tendency of the participants in the experimental group was higher than that of the participants in the control group. According to this result, it can be said that the Digital Literacy Training Program activity had a positive effect on the participants' total scores of digital addiction tendency.

Table 7. Results regarding the permanence of the effect of the applied experimental procedure on the total scores of digital addiction tendency.

Participant	Variance Source	KT	Sd	KO	F	p	Difference
Digital addiction tendency total score	Measurement	2506.71	2	1253.36	40.68	0.00*	Permanence>Posttest > Pretest
	Error	862.62	28	30.81			

When the ANOVA results for repeated measures in Table 7 were examined, it was determined that the total pretest, posttest and permanence scores of the participants in the experimental group showed a statistically significant difference ($F_{\text{group*measurement}(2-28)}=33.51$; $p=0.00$; $p<0.05$). According to the result of the post hoc test conducted to determine the source of the difference, it was concluded that the source of the difference was between permanence and pretest, permanence and posttest, and permanence and posttest scores and that the scores decreased from pretest to permanence. In other words, the

experimental process applied to the participants continued its effect after the experimental process was over.

Findings for Qualitative Data

After the posttest forms were administered to the parents in the experimental group, qualitative data were collected using a semi-structured interview form. Qualitative data were analyzed by the researcher using descriptive statistics, and the data were evaluated by creating themes and sub-themes. Information about the data obtained from the semi-structured interview forms and sample sentences are given below.

Table 8. *Data obtained from the semi-structured interview form*

Questions	Yes	Little	No
Did the digital literacy program help you?	15	-	-
Did the digital literacy training program contribute to your infant's development process?	12	3	-
Has the way you use digital tools changed after the digital literacy training program?	12	3	-
Has there been any change in your infant's interaction with digital tools after the digital literacy training program?	12	3	-

Parents in the experimental group were asked about the contribution of the Digital Literacy Training Program, and all parents in the study reported that the program contributed. In addition, the majority of parents who participated in the study indicated that there were changes in the use of digital tools, that the Digital Literacy Training Program contributed to their infants' developmental process, and that there were changes in their infants' interaction with digital tools after the Digital Literacy Training Program.

Sample sentences from the participants in the evaluation of the Digital Literacy Training Program are as follows:

"P1: The program helped me understand when and how often to use digital tools. It has taught me to support my infant with different alternatives and games instead of giving him a screen most of the time when I am feeding him, letting him take care of himself, or when I cannot calm him down. I have learned a lot

about the age at which children should be introduced to screens and how often they should be used, and I am applying it.”

A sample sentence for the participant's opinion about the activities included in the content of the digital literacy training program is given below.

“K5: First of all, the activities made the infants have a lot of fun and learned many things, for example, my daughter got the habit of reading books, learned to play with finger puppets, etc. It helped the infants in many ways.”

DISCUSSION AND CONCLUSION

The aim of the present research was to investigate the effect of the Digital Literacy Training Program prepared for parents on the tendency of digital addiction in infants and the digital burnout level of parents. When the results obtained were examined, it was concluded that the Digital Literacy Training Program had an effect on digital addiction tendency in infants and digital burnout level of parents. The effectiveness of the Digital Literacy Training Program may have been due to the presence of objectives such as conscious use of digital tools and awareness raising in the Digital Literacy Training Program. In addition, it is expected that meaningful and expected changes will be observed in the individuals participating in the training program within the objectives of the implementation and a conscious learning process will take place (Sork & Newman, 2020; Demirel, 2017).

In the sub-dimensions of digital burnout, it was concluded that there was a decrease in the total score of the sub-dimensions of digital aging, digital deprivation, and digital burnout among the participants in the experimental group. The effectiveness of the Digital Literacy Training Program and parents' awareness of digital literacy may have influenced this result. Digital literacy is an important skill for maintaining and surviving in digital life. When digital literacy skills are not developed and digital tools start to control the life of individuals, negative situations such as stress and anxiety arise (Göldağ, 2022; Altıntaş, 2020; Shine & Beak, 2013). This situation also leads to burnout. Therefore, the development of digital literacy plays an important role in minimizing the negative effects of digital tools. Studies on digital literacy have found that the importance of having digital literacy skills is increasing every

day and is now considered a necessity (Karabacak & Sezgin, 2019). In addition to all these results, the fact that there was no decrease in the subdimensions of digital burnout in the control group may suggest that the intensity of using digital tools and awareness of digital literacy should be improved. In fact, the access and use of digital tools is increasing day by day and more and more people are involved in digital life. According to TurkStat (2021), eight out of ten households in Turkey have access to the Internet, and the use of digital tools such as mobile phones and computers has increased significantly compared to the past and continues to increase. Excessive use of digital tools is considered an important risk factor for digital burnout and paves the way for digital burnout (Sharma et al., 2020).

As a result of the research, it was found that the Digital Literacy Training Program contributed to the decrease in the overall digital burnout score. This result can be interpreted as an important indicator that individuals need digital literacy skills in an age equipped with digital tools. Spending resources such as time and energy on digital tools leads to digital burnout (Omay & Omay, 2022). Individuals who spend a long time on digital tools such as social media are affected by the content they encounter in digital environments and question their parenting skills and their own physical condition, and this situation creates stress and leads to burnout (Harren et al., 2021). The occurrence of psychological wear and tear as a result of intense exposure to digital tools (Liu & Ma, 2020), in addition to the occurrence of digital fatigue (Zhang et al., 2021), is seen as an inevitable consequence of living in the digital age. This situation supports the need to develop digital literacy skills. Studies on media literacy, which includes digital literacy, have concluded that parents have limited knowledge about media literacy in the use of digital tools (İnan, 2014; Kalan, 2010). Positive effects of the program were observed in individuals who participated in a training program on media literacy (Scull et al., 2017), and they were better able to understand messages from media tools (Austin et al., 2020). Therefore, individuals' digital burnout increases as a result of prolonged use of digital tools. Since individuals can avoid the negative effects of digital tools in digital literacy, a decrease in the level of emotional exhaustion of parents participating in the Digital Literacy Training Program is an expected outcome. In fact, in a research on this topic, while individuals

benefit from the positive effects of digital media through digital literacy, it also aims to reduce the negative effects of digital tools (İrvan, 2023).

Another result obtained in the study showed that the decrease in the total score of digital addictive tendencies of the participants in the experimental group was higher than that of the control group. In other words, according to this result, it can be said that the Digital Literacy Training Program activity has a positive effect on the total score of digital addiction tendency in the participants' children. According to this result, it can be interpreted that with the increase in the digital literacy level of parents, there is a decrease in the tendency of digital addiction in children. Parents' attitudes toward the use of digital tools may be related to their level of digital literacy. Therefore, parents who are aware of digital literacy can prevent the development of digital addiction by regulating the way infants use digital tools. In addition, the fact that digital tools affect family relationships increases the need for parents to have digital literacy skills (Karaboğa, 2019). If parents who gain awareness through a Digital Literacy Training Program become positive models for their infants by regulating their own use of digital tools, the risk of digital addiction may decrease. In fact, in a study conducted on digital parenting, parents stated that infants take models and imitate parental behaviors through observation (Manap, 2020). Therefore, an important factor in reducing the risk of digital addiction among infants is to increase the level of digital literacy among parents.

When the results of the permanence test of the parents in the experimental group were examined after the completion of the Digital Literacy Training Program; it was seen that the effect continued after the experimental process ended. Considering the evaluations of the participants in the experimental group about the program through the semi-structured interview form; the fact that the program is oriented to the needs of the participants, supports the acquisition of awareness, and provides interesting new information may have an effect on the sustainability of the Digital Literacy Training Program. In addition, the fact that parents have a desire to support their infants developmentally and participate in the program with a desire to protect their infants from the negative effects of digital tools, especially in the digital age

when the use of digital tools has become too much, can also be considered as an important factor in the sustainability of the program.

Limitations of the Study

The research is limited to parents who live in the Diyarbakır city center, have a 6–36-month-old infant, have not received digital literacy training before, and have at least a primary school education. Although the digital literacy training program targeted all parents, only one father participated in the research due to the lack of voluntary participation among fathers, which is considered a limitation. Additionally, the number of participants decreased from 25 to 15 during the course of the research. This decrease was primarily due to parents who were unable to attend the training program regularly or who voluntarily decided to withdraw from the research. This decline in the participation rate is another limitation of the research, potentially affecting the overall outcomes and generalizability.

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