
Effect of implementing parental strategies on preventing digital overdependence among their preschool children

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Abstract

Background: Overuse of digital devices is a practice known as "digital overdependence," which can have a number of adverse implications on children's socialization, physical and mental wellbeing, sleep quality, and psychological dependency. Additionally, it negatively impacts preschoolers' general development. **Aim:** the current study aimed to determine the effect of implementing parental strategies on preventing digital overdependence among their preschool children. **Research design:** A quazi experimental design was used to fulfill its aim. **Subjects:** 218 participant parents divided equally to 109 for rural and 109 for urban nurseries who were registered at the selected nurseries at the time of the study. **Tool of data collection:** Five questionnaires were used tool (1) Sociodemographic criteria, (2) Over-dependence criteria of digital devices (3) Problematic technology use scale for young Children (HFS-P) (4) The proposed causes of digital overdependence (5) The proposed preventive strategies of overdependence. **Results:** the current study showed that, 85.8% of total sample aged 5 years old, 57.3 % of participant mothers aged 20 :< 30 years old. About 41.7% of the total sample (21.1 % and 20.6 % of those at urban and rural areas respectively) spent 3:4 hours per day on the internet, (85.8%) of the participant pre-school children had headache, (76.6%) had blurred vision and (64%) had eye redness. **Conclusion:** 58.8 % of the total sample divided into 26.2 % and 32.6 % of urban and rural residence aged 5 years old. There was a statistically significant relation between pre-school level of internet addiction and the problematic technology use domains except effect on development. Indeed, $3.55 \pm .20964$ of participant preschool children mean scores as reported by their parents prefer digital life to real life, which decreased to $2.44 \pm .23973$ after implementing the preventive strategies. **Recommendations:** Encourage children to read books or tales in the library, play in groups, and participate in sports in the sports clubs to help them improve their mental and physical skills.

Keywords: digital overdependence, preschool children, parental preventive strategies

Introduction

Ivan Goldberg, a physician in New York, originally described internet addiction illness in 1996. Goldberg substituted the term "substance" with "internet" while applying the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM 5)-IV criteria for addiction to substances. Behavioral addiction was included as a recent category of mental illnesses in Substance-Related as well as Addictive illnesses in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM 5). Also, compulsive gambling was the diagnostic for behavioral addiction, and internet gaming disorder was the subtype **(Lee & Bhang, 2023)**.

Addiction, in its broadest sense, may be described as an overly reliance on a certain good, drug, object, or technology. Similar to an obsession, compulsion, or yearning is addiction. It may be extended to the pervasive smartphone gadgets that have become as a serious global health issue, in addition to substances and gambling. Addiction to smartphones implies everyday excessive usage, recurrent use, and damaging conduct. It is feasible to use a smartphone anywhere, at any time, due to its mobility and accessibility. One type of technology addiction that could be recognized is smartphone addiction **(Burke, 2019)**.

Furthermore, although being a useful tool for communication, cell phones are known to have negative side effects if misused. Shockwave radioactive radiation from mobile phones has a different negative impact on children's bodies **(Hanief, 2023)**. Preschoolers are highly drawn to smart technologies, such as cellphones. Moreover, according to **Park & Park, (2021)**, preschoolers who utilize smart gadgets may

have an addiction rate of one in five. Preschoolers are more likely to become hooked to smart devices (as smartphones as well as tablets) because to their over-reliance on technology and lower cognitive abilities compared to adults.

People now live in a time of rapid technological growth. Today's communities find it impossible to conceive living without the internet, cellphones, and computers that power them. However, technology also has drawbacks. Concerns about their children's over reliance on the internet are common among parents. The quantity of time the kids spend playing online games and their resistance to cutting back on time are the two main causes of the parents' worries. The social lives of children are being impacted by the excessive amount of time they spend on digital electronics. Kids refuse to eat, sleep, complete their homework, or even go outside and play **(Sharma, 2021)**.

Early infancy is so essential to a child's growth and wellness. A research suggests that young children's health may suffer as a result of an over reliance on screen media. Even if smart technology is useful for raising children in today's world, too much screen time has a different of detrimental effects on a child's development and maturation. Decreased visual acuity, shorter sleep duration, a higher chance of obesity, delayed cognitive and linguistic development, a decline in social contact, and a danger to physical wellbeing due to musculoskeletal problems are all associated with longer screen usage **(Hu et al., 2019)**.

Children between the ages of one and six who are overly dependent on and use cellphones excessively have an impact on their sociability and activity levels as well as their emotional sensitivity. Additionally, a digital

gadget addiction can disrupt family unity and lead to parent-child conflict. Up to twelve to sixteen times each day, parents and preschoolers' interactions or activities may be interrupted by digital gadgets. Consequently, it's critical to comprehend the elements causing or mitigating kids' addiction to smart gadgets (Lee & Kim, 2022).

Additionally, the harmful impacts of technology addiction in preschool-aged children can be social, psychological, as well as physical; these impacts vary depending on the child's traits, the type of gadget, and the quantity and duration of use. Over-reliance on digital devices results in problematic phone use. Preschoolers who are addicted to technology typically engage in less physical activity, which raises their risk of obesity, ocular, sleep, and musculoskeletal issues. Psychologically, preschoolers who are addicted to technology are more likely to experience addictive disorders, sadness, anxiety, aggressive and violent conduct, and difficulty telling the difference between truth and fiction. Studies that are pertinent to the evidence show that children's problematic technology utilization has a detrimental impact on their peer relationships (Abdulla et al., 2023).

In the same setting, low academic achievement, issues with social and linguistic development, and inappropriate technology usage in preschoolers are linked. Socially, addiction to technology is linked to less family time also the communication, more social isolation, as well as worse development of interpersonal skill in preschoolers (Nassar et al., 2022). Evidences on the potential health and developmental risks of screen usage for children below five years old was conducted by the American Academy of Pediatrics.

They advise controlling young children's media use in an organized manner by establishing time and content restrictions and encouraging parent-child interaction during screen time (American Psychology Association, 2019).

The nurse's job should be to educate parents on the value of limiting their daily screen time, which includes using a computer, TV, mobile device, and DVD. They should also assist in helping parents comprehend what their children are seeing by co-viewing with them. Additionally, providing parents with health education about the significance of observing their children's media consumption and the applications they use or download, testing apps before the child utilized them, playing together, finding out what the child thinks of the apps, and preventing screen time for parents, kids, and bedrooms. In fact, the nurse ought to educate the child caretaker on the value of family time and advise them to use their phones' "do not disturb" feature during this time (Drouin, McDaniel, & Newsham, 2020)

Research Significance

Despite the fact that all youngsters have trouble with improper technology use. Preschool involves a number of crucial developmental activities related to children's social, psychological, motor, and physical growth. Maintaining this stage in a healthful manner is crucial for children's development. Preschoolers' exposure to technology is increasing due to its increased use in younger age groups in recent years, which might be harmful to their development (Konca, 2022). Preschoolers who use technology for two to three hours a day on average run the danger of not meeting the healthy usage guidelines set out by international organizations (American Academy of Pediatrics 2016).

Also in relation to a recent poll, ninety-two percent of people on the planet currently own a mobile phone. Of which thirty one percent acknowledge that they never put their phones away. With cell phones readily available to them at all times, over ninety percent of parents give their children access to them. All of this provides ample justification for discussing mobile phone addiction, particularly in light of potential risks to children's health (**Khan, 2019**).

Egypt's mobile phone penetration rate in the third quarter of 2022 was about 94.3%, down from 97.9 % in the same quarter of the last year (**Galal, 2022**). There were 95.75 million connections mobile on Egypt in January 2021. Between January 2020 and January 2021, there was a 2.7 million (+2.9%) rise in Egypt's mobile connection count. In January 2021, the proportion of mobile connections in Egypt's population was 92.7%. Note: Since many people have several mobile connections, the percentage of people with mobile connections may approach one hundred percent (**The Ministry of Communications and Information Technology, 2021**).

Methodology:

Aim of the study:To determine the effect of implementing parental strategies on preventing digital overdependence among their pre-school children through the following objectives

1. To assess over-dependence criteria of digital devices and its proposed causes among the pre-school children.
2. To determine the problematic technology use state among the pre-school children before and after implementing parental strategies.

3. To determine the degree of digital overdependence among preschool children.
4. To assess physiological complaints among preschool children.

Research hypothesis:

1. Parents who will receive the preventive parental strategies will have improved mean scores after implementation than before.
2. The mean scores of problematic technology use domains among preschool children will be improved after implementing related parental preventive strategies than before.

Subjects and Methods

Research Design:

A quazi experimental design was used to fulfill the aim of the actual research.

Settings

The researchers prepared 2 lists combined 87 nurseries for rural and urban nurseries. Minia City of Minia Governorate. Using simple random technique, the researchers selected 3 nurseries to be representative to rural nurseries including Elborgaiah, Aboswelam and Damsher. In the same manner, the researchers randomly selected Allomty, Shalaby and Elekhsas to be representative to urban nurseries.

Sample

A stratified random sample was utilized by dividing the nurseries into 2 strata involving rural and urban sectors by making a list to each, then 3 nurseries including rural nurseries numbers were 80, 60 and 45 of Elborgaiah, Aboswelam and Damsher respectively. Urban nurseries numbers were 90, 150 and 80 of Allomty, Shalaby and Elekhsas respectively so total number was=505 (**Minia Educational administration, 2023**)

Sample size

Using epi-info software program version 22 at population size equal 505, expected frequency equal fifty percent, acceptable margin of error equal five percent, design effect equal one and cluster equal one, the estimated sample size was 218 divided equally to 109 for rural and 109 for urban nurseries.

Inclusion Criteria

- Parents whose children at preschool period (3- less than 6 years old).
- Registered children at the selected nurseries at the time of the study.

Data Collection instrument

I- **Sociodemographic characteristics questionnaire:** it was employed to assess the characteristics of children and their parents. It consisted of two main parts as following:

- A. **Child Demographic Characteristics:** It consisted of 3 questions about gender, age and birth order.
- B. **Parents' Demographic Characteristics:** It consisted of 10 questions such as father and mother education and occupation.

II- **Physiological complaint questionnaire: it used to assess different child's complaints as reported by their parents. It was adapted after extensive reviewing of literature Melton, Bigham, Bland, Bird, & Fairman, (2014). It divided into 2 main domains**

1. **Physiological problems of preschool children** as reported by parents including **7 questions with yes or no responses related to** headache, blurred vision, eye redness and dryness, disturbed food intake, muscle spasm and weight gain /loss.
2. **Sleep, attention , concentration and cognitive problems among preschool**

children as reported by parents including 8 questions with yes or no responses concerning unable to concentrate on little things, inadequate of sleep periods, unable to wake up early as well as nightmares, decreased attention and concentration, frequent absenteeism, low rate of linguistic and cognitive performance, unable to logical think.

II-Over-dependence criteria of digital devices questionnaire: it was adapted from **Lin et al., 2016**. It was utilized to determine the diagnostic criteria Over-dependence among the participant pre-schools children. It composed of 4 questions in the type of MCQs such as Daily Internet usage average with responses including more than 2:<3, 3:4, more than 4 hours and at what age at which child started using digital devices by years including 1 year, 2 years and 3 years. Multimedia applications question with responses including videos, cartoon and TV series. Internet access devices at home.

Reliability:

The internal consistency of the physiological complaints, pre-school problems, and over-dependence criteria of digital device questionnaires were tested using test-retest reliability. The reliability of these questionnaires was confirmed with Cronbach's α values of 0.78, 0.83, and 0.82, respectively, indicating that the questionnaire is reliable to meet the study's objectives (**Can, 2019**).

Scoring system:

The level of internet addiction (The internet risk use) was classified into mild (more than 2 hours to <3, moderate (3 :4 hours) and severe (more than 4 hours), then relationships between it and sociodemographic criteria, and the overdependence criteria was estimated based on its classification

III- Problematic Technology Use Scale for Young Children. It adopted from **konca et al., 2022**. Its responses were 5 Likert responses including **completely disagree, somewhat disagree, undecided, somewhat agree and completely agree**. It consisted of 26 items divided as following clarification:

Dimensions	No. of questions
Continuity of Use	(22- 21 -19- 15- 4-3-2-1)
Resistance to Control	(26- 25 -24- 23- 14-11)
Effect on Development	(20- 18 – 17 – 16 -12)
Deprivation-Escape	(13- 10- 9 -8 -7- 6- 5)

Reliability of Problematic Technology Use Scale for Young Children:

Total reliability was = 0.963 verified by Cronbach Alpha by as showed in the table below for each item

Dimensions	Cronbach Alpha
Continuity of Use	.903
Resistance to Control	.876
Effect on Development	.902
Deprivation-Escape	.882
Total	.938

The reliability coefficients were interpreted by taking this into consideration. Measurement tools must be 70 or higher to be dependable (**Can, 2019**).

Scoring System: each 5 Likert responses were scored from 1: 5 for completely disagree equal 1, somewhat disagree equal 2, undecided equal 3, somewhat Agree equal 4 and completely agree equal 5. The scores were reversed according to the direction of questions. The total scores for each domain were computed separately as a summation of each allocated items as following:

Continuity of Use containing 8 items were summated from zero to and multiplied by 8 to be from 0:8 divided into mild from 0: >3, moderate from 4 : <6 and severe from 6: 8
Resistance to Control containing 6 items were summated from zero to 1 and multiplied by 6 to be from 0 :6 divided into mild from 0: <4, moderate from 4 :<5 and severe from 5:6
Effect on Development containing 5 items were summated from zero to 1 and multiplied by 5 to be from 0:5 divided into mild from 0: <3, moderate from 3 : <4 and severe from 4: 5. Then using chi square test the results were compared with the level of internet addiction for each domain as shown in the relationship table.

Deprivation-Escape 7 items were summated from zero to and multiplied by 8 to be from 0:7 divided into mild from 0: >3, moderate from 4 : <6 and severe from 6: 7

IV-The proposed causes of digital overdependence child questionnaire. It adapted from (**Wu et al., 2016 and Lin et al., 2014**). It was divided into the following

A- Causes of digital overdependence related to pre-school children. It used to determine the reported causes concerning pre-school children as perceived by parents. It was consisted of 6 (yes or no) questions including Children having negative emotion to parents, connect with friends via the internet, tendency to be addicted to smartphones, prefer playing with phones, inability to control usage and cognitive dependence on smart phones.

B- Causes of digital overdependence related to parents: It used to determine the reported causes related to parents themselves. It was consisted of 4 (yes & no) questions including have internet accessibility at home, mothers were addicted to smartphones, Transmission to online learning and

education especially after covid 19 and Parent having negative emotions to their children.

IV- Preventive Strategies of overdependence questionnaire. It adapted from (EDUCARE Specialist Services, 2023). It used to assess the effect of the introduced preventive strategies before and after the implementation. It consisted of 9 questions such as replacing device use with other physical activities and real enjoyable activities with responses completely done or Partial done or not done.

Validity:

Face validity It refers to the extent to which the tool appears on surface “face” to assess the intended variables. It is a subjective and initial judgment about whether the content of the test seems appropriate and relevant. At the current research, the researchers checked face validity by analyzing the interviews with the participant parents. The researchers probed for correctness, thoroughness, understanding, and viability. They also asked the parents of the participants to clarify their responses to the questionnaires in order to verify understanding.

Content validity: Five experts in the fields of community health nursing (three experts) and psychiatric nursing (two experts) evaluated the questionnaire for content validity.

Ethical Consideration:

Ethical approval for the study was secured from the Scientific and Ethical Committee of the Faculty of nursing at Minia University. Parents were given information about the study's goals and anticipated results during the initial appointment. Participants were assured of the research's safety as well as their ability to discontinue participation at any time without providing a justification. Each parent provided an informal verbal consent before

starting the data collection. The researchers assured participants that their involvement in the research was completely voluntarily, and the information gathered is kept private.

Pilot Study:

To guarantee the stability of the replies, a pilot study using ten percent of the research sample (22) was conducted and subsequently removed from the sample. It was carried out to evaluate the tool's readability. Before putting preventative measures into practice, a baseline evaluation using a checklist was conducted and completed by all participating parents to determine their requirements. It also helped to project how long the tool would take to complete (20: 25 minutes).

Field Work:

The data collection period spanned a total of 2months, commencing in January 2024, and concluding in February 2024. During this time frame, the researchers were present at the study setting 4 days a week. Their availability was from 9 o'clock in the morning to 1 o'clock in the afternoon. The researchers conducted the pre assessments of negative effects of digital overdependence among preschool children and implementing related parental preventive strategies. These assessments were carried out in various phases throughout the data collection period.

Assessment phase:

The process started by meeting with the mothers. At the start of the interview, the researchers introduced themselves and discussed the purpose, nature, and content of the study educational guidelines. They highlighted that the goal was to determine Effect of implementing parental strategies on preventing digital overdependence among their preschool children. Completing the

questionnaire took from 20-30 minutes per parent.

Implementation phase:

After getting their permission and cell phone numbers, the researcher chose participant parents from the chosen nurseries. Pre-tests were obtained on the first appointment in order to establish baseline data. The researchers identified four days a week, in the morning or the afternoon, as the best times to drop off kids at daycare centers. The entire sample was divided into two equal groups—rural and urban—and a schedule of subjects and assigned groups was announced. Each group, at most, included eight or ten participant parents. A first assessment was performed by the researchers. Each group received an intervention for four weeks in a row, with four sessions per week, for a total of sixteen instructional sessions including the final interview, lasting two hours each.

The interventions were given to all participant groups for a period of two months. Each session started with the researcher summarizing the one before it, getting their input, and then moving on to the next. The researchers considered applying simple and obvious language. Researchers provided health education about physiological and psychological symptoms of digital overdependence, definition, causes, and consequences of internet overdependence on preschool children and strategies of preventing overdependence.

The instruction brochure was given to every research participant. A brochure that includes the program's content was written in Arabic and with pictures and diagrams to help parents comprehend it. The following preventive educational resources were made especially for the program: a flipchart, a brochure, an interactive lecture, questions

and discussion, a film, and real-world examples. Each session concluded with a discussion of the questions raised by the parents to clear up any misconceptions. To ensure that the parents understood the program content, each session ended with a summary of the material that had been covered at the beginning in simple language that was understandable to all of parents.

Evaluation phase

Parents were evaluated pre-intervention to get a baseline assessment before development of the educational guidelines and the researchers re-administered the study questionnaires to assess the impact of educational strategies. Also, post intervention test was applied immediately after the implementation of the program.

Statistical Analysis: -

Information was coded. Version 22 of SPSS (Statistical Package for Social Science) was used for data entry and analysis. The quantitative data was represented by mean (X). The student t-test was used for analysis in order to compare the two means. On the other hand, percentages, numbers, and frequency distribution charts showed qualitative data. It was tested by chi-square (χ^2) test. Chi-square test to measure difference between observed and expected data is due to chance or it is due to a relationship between the studying variables. However, in the event that any cell in the table had an expected value less than five the Likelihood Ratio (LR) test or the Fisher Exact test were applied, depending on whether the table included four or more cells. For every relevant test, the P value <0.05 was designated as the level of significance. Graphic was extracted using Excel software program.

Results:

Table 1 explains the socio-demographic criteria of pre-school children and their parents as. 85.8 % of total sample divided into 26.2 % and 32.6 % of urban and rural residence aged 5 years old. 46.4 divided as 13.8% and 14.8 % urban and rural residence ordered as the first birth order.

Regarding parents' demographic characteristics, 57.3% of the total sample divided into 28.4% and 28.9% of urban and rural participant mothers aged 20-30 years old, also, 6.9 and 25.4 of father of urban and rural residence aged 20-30 years old revealing significant difference.

Also, 57.3% of the total sample divided into 28.4 % and 28.9 % of the participant fathers stayed at urban and rural areas respectively spent more than 4 hours daily on their smart phones. Likewise, 70.7% of the total sample divided into 35.8 % and 34.9 % of the participant mothers stayed at urban and rural areas respectively spent 3-4 hours daily on their smart phones. There is no significant difference.

Table (2) explains the criteria of over-dependence of digital devices among the participant pre-school children as 41.7% of the total sample divided into 21.1 % and 20.6 % of those at urban and rural areas respectively spent 3:4 hours per day on the internet. 46.4% of the total sample divided into 24.8 % and 21.6 of children stayed at urban and rural areas respectively had 3 years of internet accessibility. There is no significant difference. 51.8% of the total sample divided into 26.6 % and 25.2 % of children at urban and rural areas respectively had smart phone revealing significant difference.

Figure 1 illustrates that 43 .1% and 42.7 % (85.8%) of the preschoolers had headache.

33.5 % and 43.1 % (76.6%) had blurred vision. 33% and 31 % (64%) participant children had eye redness Also, 22 % and 31 % with total (53%) of the participant pre-school children had disturbed food intake.

Figure 2 demonstrates that, 72% of the total sample divided into 37 % and 35 % of the participant pre-school children of urban and rural areas respectively had lack of sleep periods. 95 % of the total sample divided into 47 % and 48 % of the participant pre-school children of rural and urban areas were unable to wake up early after periods of staying on smartphones. 28% of them divided into 15 % and 13 % respectively were unable to think logically.

Figure 3 explains pre-school related causes as reported by parents as 80.3% of the total sample divided into 45 % and 35.3 % of them stayed at urban and rural areas respectively attributed their overdependence to connection with friends via internet. 59.9% of the total sample divided into 38 .8 % and 21.1 % of pre-school children stayed at urban and rural areas respectively had negative emotion to parents and 50% of the total sample divided into 28.9 % and 21.1 of participant children stayed at urban and rural areas respectively had cognitive dependence on smartphones

Figure 4 explains the reported causes related to parents as 95.4% of the total sample divided into 47.7 % of both groups (urban and rural) attributed their digital overdependence to transmission to online learning after occurrence of covid 19. 78.2% of the total sample divided into 42.7 % and 35.5 of the participant parents attributed their digital overdependence to accessibility of internet at home and 55% of the total sample divided into 28.4 and 26.6 % attributed the overdependence to mother addiction.

Table 3 Continuity of Use: 1-2-3-4-15-19-21-22: as $3.55 \pm .20964$ of mean scores of participant preschool children as reported by their parents prefer digital life than real life turned to $2.44 \pm .23973$ after implementing the preventive strategies. mean scores of participant preschool children $4.28 \pm .17731$ turned to $3.17 \pm .11671$ after implementing related parental preventive strategies respectively with significant time increase between their child's early and present technology use. There is a statistically significant differences' regarding items of continuity of use from 1:4.

The same table demonstrates that mean score of children who spent time alone with technological tools $4.28 \pm .12393$ turned to $3.07 \pm .00839$ after implementing related parental preventive strategies. $3.14 \pm .12528$ of preschool children mean score who spent time with technological tools just before going to sleep decreased to $1.92 \pm .19889$ after implementing related parental preventive strategies. There were significant differences.

Resistance to Control: 11-14-23-24-25-26 As: $4.56 \pm .20705$ of children mean score who spent time on technological tools by playing games or watching movies that are not suitable for his/her age before implementation decreased to $3.88 \pm .21557$ after implementing related parental preventive strategies revealing significant difference. In the same manner, $4.47 \pm .15463$ of children mean score who did not tell parents or lied about what they doing while using technological tools before implementation decreased to $3.82 \pm .18948$ of their mean scores after implementing related parental preventive strategies.

Effect on Development: 12-16-17-18-20 , the related parental preventive strategies

improved only item 20 concerning children desire to eat while spending time on technological tools as $4.37 \pm .12529$ of their mean score decreased to $3.39 \pm .26092$ after implementation. Items 12 , 16, 17, 18 the related parental preventive strategies has no effect as child's use of technological tools negatively affects his/her interaction with his/her environment was $1.95 \pm .14941$ of participant means before implementation increased to $2.67 \pm .19687$ after that.

Deprivation-Escape: 5-6-7-8-9-10-13:Pre-school children means who preferred playing games on technological tools to playing games in real life were $4.24 \pm .10305$ before implementation decreased to $3.95 \pm .28355$ after implementing related parental preventive strategies revealing significant difference.

The same table demonstrates that pre-school children mean scores, $4.21 \pm .19963$ who spent time with technological tools without fulfilling daily responsibilities before implementation decreased to $3.51 \pm .18793$ after implementing related parental preventive strategies revealing significant difference.

Table 4 explains preventive strategies of overdependence for parents of preschool children before and after implementation as $3.51 \pm .18793$ of the participant parent mean score replaced the electronic device use with other physical activities among their preschool children before implementation increased to $4.45 \pm .43116$ after implementing related parental preventive strategies revealing significant difference.

Moreover, $2.11 \pm .24751$ of the participant parent mean scores who made a list of things that must be done before device time among their preschool children before implantation increased to $5.06 \pm .38545$ after implementing

related parental preventive strategies revealing significant difference.

Indeed, $3.53 \pm .22822$ of the participant parent mean score reduced device time gradually instead of stopping among their preschool children before implantation increased to $5.13 \pm .34918$ after implementing related parental preventive strategies revealing significant difference.

$1.83 \pm .24154$ of the participant parent mean scores who set boundaries and a daily period when there is no device use as not to declared phone password especially in time of study work, eating and family meetings increased to $3.78 \pm .35939$ after implementing related parental preventive strategies revealing significant difference.

$1.60 \pm .23399$ of the participant parent mean scores who participated in group activities and had fun with a group of friends increased to $4.23 \pm .41096$ after implementing related parental preventive strategies revealing significant difference.

Table 5 shows a statistically significant relationship regarding sociodemographic criteria of both participant pre-school children and their parents except in relation to residence, father job and income.

38.5 % of participant pre-school children with moderate addiction were aged 4 years ago. 28.4 % of participant pre-school children with moderate addiction ranked second birth order.

20.6% of participants pre-school children with moderate addiction their mothers were aged 20-30 years old. Moreover, 14.7 % of Divorced parent had children with severe addiction. Also 14.7 % of participant parents who spent more than 4 hours using smart phone had pre-school children with severe addiction.

Table 6 reveals a statistically significant relationship between pre-school level of internet addiction and the years of internet accessibility as 14.2 % of preschool children with severe addiction had accessibility to internet from 2 years ago. Also, a statistically significant relationship between pre-school level of internet addiction and Multimedia applications as 14.7 % of preschool children with severe addiction watched videos.

Table 7 reveals a statistically significant relation between pre-school level of internet addiction and the problematic technology use domains except regarding effect on development as 41.7 % of pre-school children who had moderate addiction were severely use technology on continuous bases. Also, 20.6 % of participant pre-school children who had resistance to control their technology use, had moderate level of addiction.

Table (1) Sociodemographic criteria of pre-school children and their parents: N= 218

Criteria items	Urban 109		Rural 109		Total	X ² P
	N	%	N	%	%	
Child Demographic Characteristics						
Child sex: Male	43	19.7	65	29.8	49.5	8.881
Female	66	30.3	44	20.2	50.5	.003*
Child age : Four years	52	23.9	38	17.4	41.3	4.536
Five years	57	26.2	71	32.6	58.8	.104
Birth order:	30	13.8	31	14.2	28	1.644
First						.439
Second	47	21.6	54	24.8	46.4	
Third and more	32	14.7	24	11	25.7	
B-Parents' Demographic Characteristics						
Mother age: <20	0	0	46	21.1	21.1	93.008
20- <30	62	28.4	63	28.9	57.3	.000*
30- 40	47	21.6	0	0	21.6	
Father age: <20	0	0	31	14.2	14.2	93.008
20- <30	15	6.9	56	25.7	32.6	.000*
30- 40	47	21.6	22	10.1	31.7	
Father education: Primary	0	0	15	6.9	6.9	107.520
Secondary	16	7.3	77	35.3	42.6	.000
High	93	42.7	17	7.8	50.5	
Mother education:	0	0	29	13.3	13.3	36.751
Primary	78	35.8	47	21.6	57.4	.000*
Secondary	31	14.2	33	15.1	29.3	
High						
Fathers' job: Work	109	50	109	50	100	-
Not work	0	0	0	0	-	
Mother job: Work	77	35.3	64	29.4	64.7	3.393
Not work	32	14.7	45	20.6	35.3	.065
B-Parents' Demographic Characteristics						
Parents' marital status	77	35.3	78	35.8	71.1	.039
Married	16	7.3	16	7.3	14.6	.981
Divorced	16	7.3	15	6.9	14.2	
Widowed						
Family income: Not sufficient	109	50	109	50	100	-
Sufficient	0	0	0	0	0	
	16	7.3	15	6.9	14.2	.040

Criteria items	Urban 109		Rural 109		Total	X ² P
	N	%	N	%	%	
Daily duration of fathers' use of smart phone (by hours). 1-2 3-4 More than 4	31	14.2	31	14.2	28.4	.980
	62	28.4	63	28.9	57.3	
Daily duration of mothers' use of smart phone (by hours). 1-2 3-4 More than 4	15	6.9	17	7.8	14.7	.151 .927
	78	35.8	76	34.9	70.7	
	16	7.3	16	7.3	14.6	

*Significant (P<0.05)

Table (2) distribution of the pre-school children over-dependence of digital devices N= 218

Criteria items	Urban 109		Rural 109		Total %	X ² P
	N	%	N	%		
Daily Internet usage average per hour						
More than 2:<3	47	21.6	48	22	43.6	.022
3:4	46	21.1	45	20.6	41.7	.989
more than 4	16	7.3	16	7.3	14.6	
Years of internet accessibility						
1 year	12	5.5	16	7.3	12.8	1.158
2 years	43	19.7	46	21.1	40.8	.561
3 years	54	24.8	47	21.6	46.4	
Multimedia applications						
Videos	47	21.6	47	21.6	43.2	.000
Cartoon	46	21.1	46	21.1	42.2	1.000
TV series	16	7.3	16	7.3	14.6	
Internet Access Devices at home						
TV	0	0	16	7.3	7.3	34.390
Computer	10	4.6	16	7.3	11.9	.000*
Lap	11	5	16	7.3	12.3	
Smart	58	26.6	55	25.2	51.8	
Tablet	30	13.8	6	2.8	16.6	

*Significant (P<0.05)

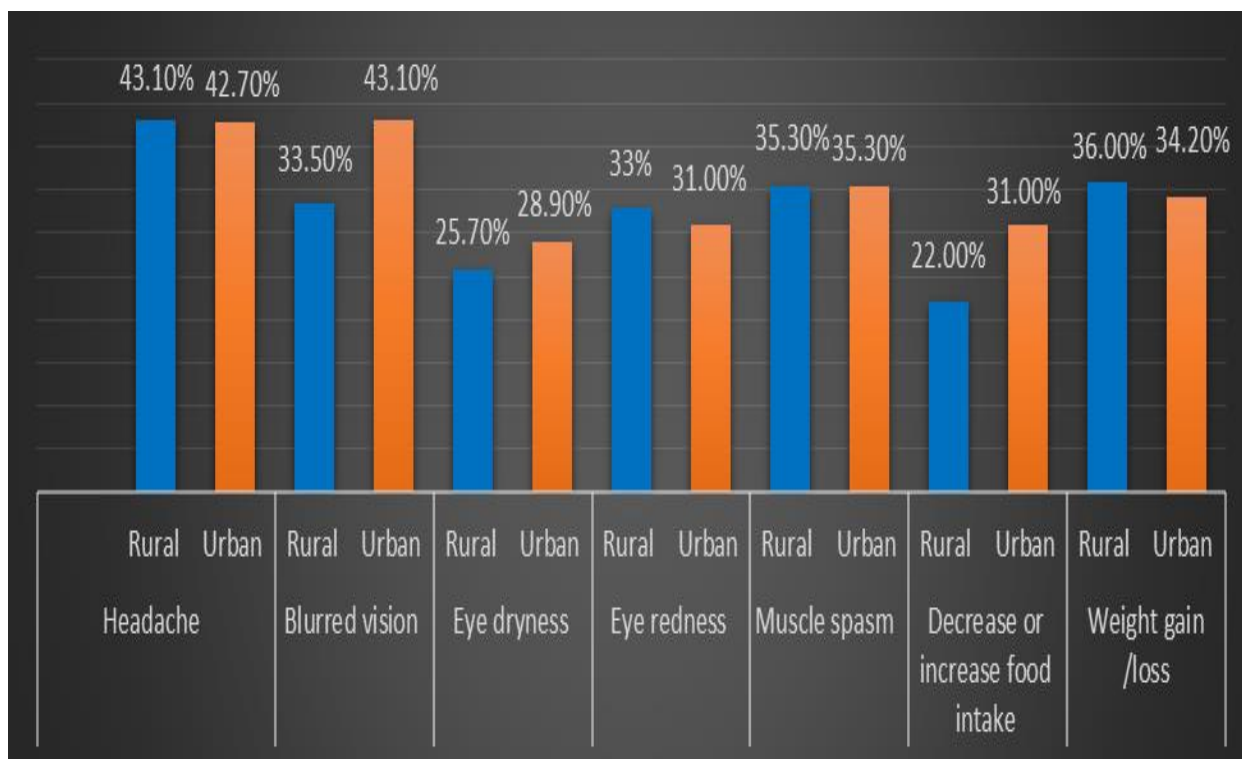


Figure (1) Physiological problems of preschool children as reported by participant parents at rural and urban residence: N= 218 divided equally 109 for each group (50 %)

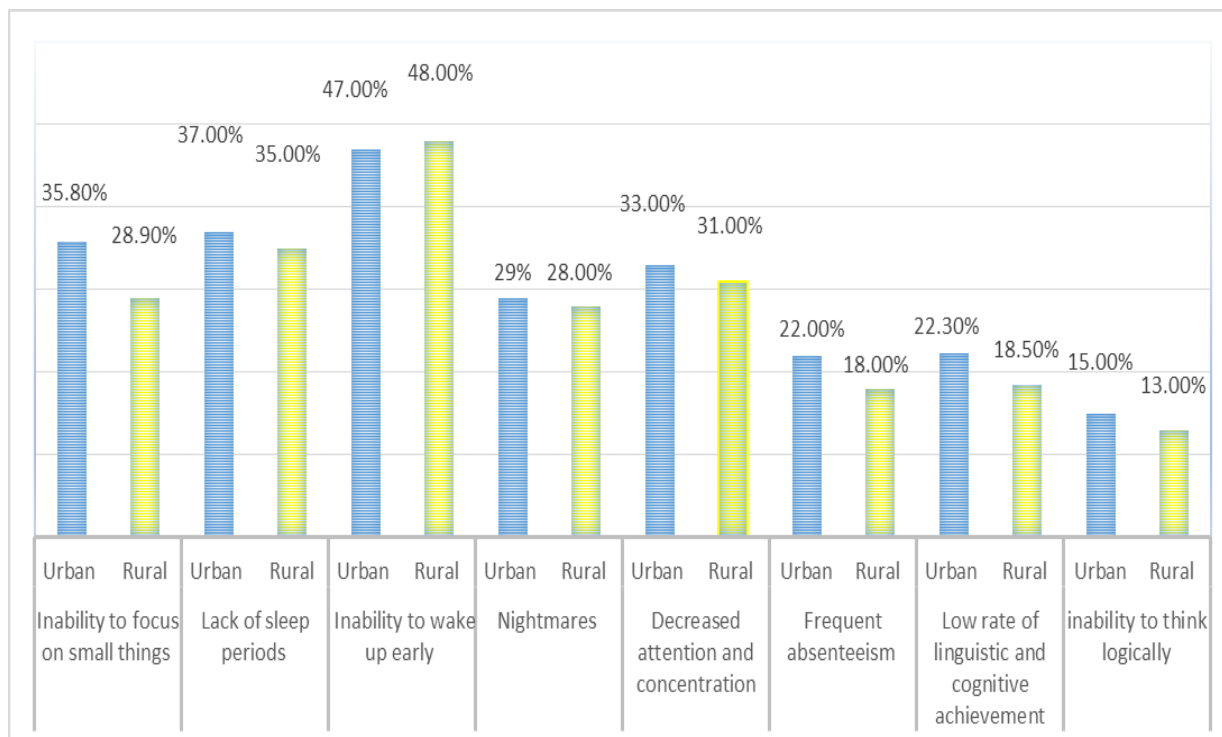


Figure (2) sleep, attention , concentration and cognitive problems among preschool children as reported by parents divided equally 109 for each group (50 %)

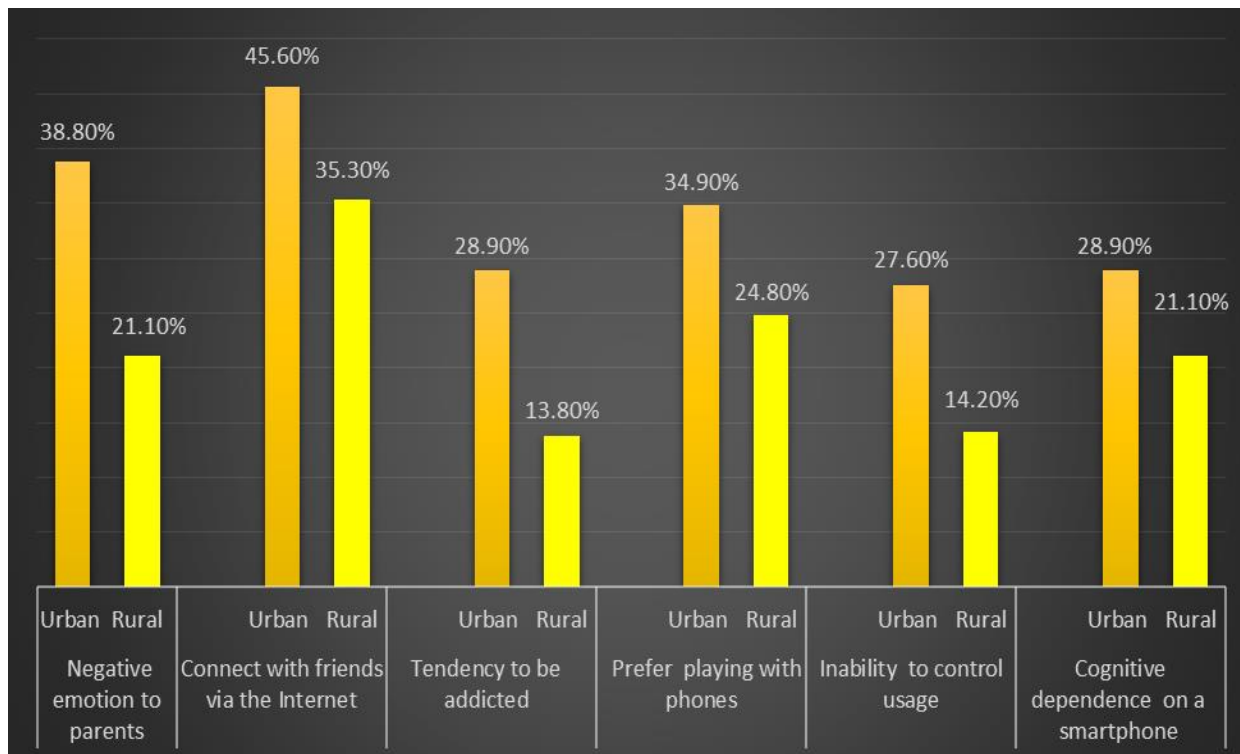


Figure (3) Distribution of reported causes of digital overdependence related to pre-school children (N=218, 109 for each location).

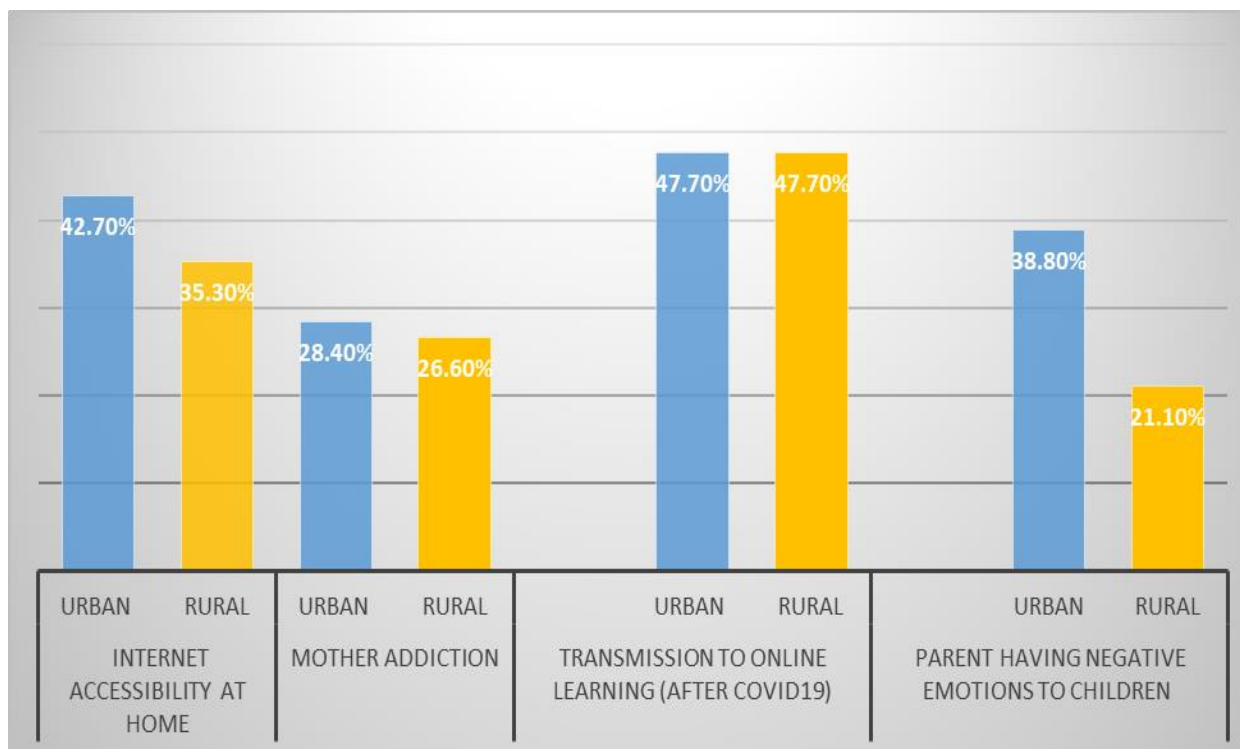


Figure (4) Distribution of reported causes of digital overdependence related to parents (N=218, 109 for each location).

Table (3) Mean differences of problematic technology use among preschool Children before and after implementing related parental preventive strategies: N=218

Serial number	Problematic technology use items	Pre Mean± SD	Post Mean± SD	T P
1.	My child spends prefer digital life than real life.	3.55±.20964	2.44±.23973	10.345 .000*
2.	My child exceeds the time limit we have set for technology use	4.28±.12393	3.07±.17157	14.901 .000*
3.	My child often expresses a desire to spend time with technological tools	4.28±.12393	3.07±.00839	12.563 .000*
4.	There is a significant time increase between my child's early and present technology use	4.28±.17731	3.17±.11671	8.820 .000*
5.	My child starts to spend time with technological tools without fulfilling daily responsibilities.	4.21±.19963	3.51±.18793	3.940 .000*
6.	My child experiences negative emotions when he/she is not spending time with technological tools.	4.1±.23648	3.8±.22070	-2.628 .009*
7.	My child experiences positive emotions when he/she starts to spend time with technological tools	3.9±.18213	3.6±.19729	4.458 000*
8.	My child relaxes by spending time with technological tools when he/she feels sad.	4.2±.12045	3.8±.16571	6.042 .000*
9.	My child thinks about technological tools even when he/she is not spending time with them.	4.17±.16000	3.68±.16571	7.099 .000*
10.	My child prefers to spend time with technological tools instead of spending time with us or with his/her friends	4.26±.16000	3.64±.15493	6.983 .000*
11.	My child spends time on technological tools by playing games or watching movies that are not suitable for his/her age.	4.56±.20705	3.88±.21557	8.281 .000*
12.	My child's technology use makes him lonely.	2.23±.14941	3.58±.20741	- 13.767 .000*
13.	My child prefers playing games on technological tools to playing games in real life.	4.24±.10305	3.95±.28355	3.903 .000*
14.	My child does not want to go to nursery because he/she wants to spend his/her time with technological tools./frequent absenteeism	4.39±.15524	3.88±.19205	5.872 .000*
15.	My child spends time alone with technological tools	4.39±.16665	3.87±.20461	8.800 .000*
16.	My child's use of technological tools negatively affects his/her interaction with his/her environment.	1.95±.14941	2.67±.19687	- 10.092

Serial number	Problematic technology use items	Pre Mean± SD	Post Mean± SD	T P
				.000*
17.	My child's use of technological tools causes problems in his/her language development.	2.23±.12425	2.66±.19979	-5.894 .000*
18.	My child's use of technological tools has decreased the duration of his/her sleep.	1.92±.10305	3.14±.19821	- 13.900 .000*
19.	My child's use of technological tools makes him/her sedentary.	3.93±.12495	3.64±.21762	9.272 .000*
20.	My child eats/wants to eat while spending time on technological tools.	4.37±.12529	3.39±.26092	10.563 .000*
21.	My child spends time with technological tools just before going to sleep.	3.14±.12528	1.92±.19889	7.456 .000*
22.	I have disagreements with my child about the duration of his/her technology use.	4.47±.15188	3.97±.19639	6.227 .000*
23.	My child does not tell us or lies about what he/she is doing while using technological tools.	4.47±.15463	3.82±.18948	8.004 .000*
24.	My child tries to use technological tools secretly, although we limit his/her use of technology	4.28±.13701	3.83±.22012	5.653 .000*
25.	My child is annoyed when we try to communicate with him/her while spending time with technological tools.	4.19±.15690	3.68±.17958	5.724 .000*
26.	My child does not allow us to track his/her technology use	4.24±.18104	3.87±.23104	6.194 .000*

* High Significance $P \leq 0.001$

Table (4) Mean differences of Preventive Strategies of overdependence among parents of preschool Children before and after implementation : N=218

Parental Preventive Strategies	Pre Mean± SD	Post Mean± SD	T P
1- Replace the electronic device use with other physical activities	1.83±.24154	4.45±.43116	-8.243 .000*
2- Replace the electronic device use with enjoyable activities such as normal play	1.66±.25973	3.37±.34259	-6.357 .000*
3- Visit friends and relatives	1.76±.23953	4.150±.38807	-8.193 .000*
4- Make a list of things that must be done before device time	2.11 ±.24751	5.06±.38545	-9.910 .000*
5- Reduce device time gradually instead of stopping it abruptly	3.53±.22822	5.13±.34918	-6.284 .000*
6- Replace content instead of stopping usage as of educational games or videos	2.50±.25058	5.25±.37559	-9.238 .000*
7- Prioritize device use that has a positive impact such as video calls for learning or family communications	2.11±.24751	3.23±.33567	-4.390 .000*
8- Set boundaries and a daily period when there is no device use as not to declare phone password especially in time of study work, eating and family meetings	1.83±.24154	3.78±.35939	-6.750 .000*
9- Family communication and good relationships	2.29±.24972	4.35±.41069	-6.466 .000*
10- Participate in group activities and have fun with a group of friends	1.60±.23399	4.23±.41096	-8.509 .000*
11- Time limitation /Controlled use	2.47±.25056	4.19±.34511	-5.894 .000*

* High Significance $P \leq 0.001$

Table (5) Relationship between pre-school level of internet addiction and the socio demographic criteria of pre-school participant children and their parents

The socio demographic criteria	Level of internet addiction						X ² P
	Mild		Moderate		Severe		
	N	%	N	%	N	%	
A- Child Demographic Characteristics							
Child sex:	70	32.1	22	10.1	16	7.3	45.576 .000*
Male	25	11.5	69	31.7	16	7.3	
Female							
Child age :	0	0	84	38.5	6	2.8	189.881 .000*
Four years	95	43.5	7	3.2	26	11.9	
Five years							
Birth order:	32	14.7	29	13.3	0	0	143.413 .000*
First	7	3.2	62	28.4	32	14.7	
Second	56	25.7	0	0	0	0	
Third and more							
Child residence:	47	21.6	46	21.1	16	7.3	.022 .989
Urban	48	22	45	20.6	16	7.3	
Rural							
B-Parents' Demographic Characteristics							
Mother age:	15	6.9	31	14.2	0	0	41.649 .000*
<20	48	22	45	20.6	32	14.7	
20- <30	32	14.7	15	6.9	0	0	
30- 40							
Father age:<20	0	0	31	14.2	0	0	165.322 .000*
20- <30	58	26.6	14	6.4	0	0	
30- 40	6	2.8	31	14.2	32	14.7	
>40	31	14.2	15	6.9	0	0	
Father education:	15	6.9	0	0	0	0	16.946 .002*
Primary	32	14.7	45	20.6	16	7.3	
Secondary	48	22	46	21.1	16	7.3	
High							
Mother education:	15	6.9	14	6.4	0	0	16.946 .002*
Primary	63	28.9	46	21.1	16	7.3	
Secondary	17	7.8	31	14.2	16	7.3	
High							
Father job:	95	43.6	91	41.7	32	14.7	- -
Work	0	0	0	0	0	0	
Not work							

The socio demographic criteria	Level of internet addiction						X ² P
	Mild		Moderate		Severe		
	N	%	N	%	N	%	
Mother job:	32	14.7	77	35.3	32	14.7	259.764 .000*
Work	63	28.9	14	6.4	0	0	
Not work							
Parents' marital status	64	29.4	91	41.7	0	0	259.764 .000*
Married	0	0	0	0	32	14.7	
Divorced	31	14.2	0	0	0	0	
Widowed							
Family income :	95	43.6	91	41.7	32	14.7	-
Not sufficient	0	0	0	0	0	0	
Sufficient							
Daily duration of father smart phone (by hours).	31	14.2	0	0	0	0	148.784 .000*
1-2	0	0	62	28.4	0	0	
3-4	64	29.4	29	13.3	32	14.7	
More than 4							
Daily duration of mother smart phone (by hours).	32	14.7	0	0	0	0	261.391 .000*
1-2							
3-4	63	28.9	91	41.7	0	0	
More than 4	0	0	0	0	32	14.7	

*Significant :P<0.05

Table (6) relationship between pre-school level of internet addiction and the overdependence criteria: N= 218

The overdependence criteria	Level of internet addiction						X ² P
	Mild		Moderate		Severe		
	N	%	N	%	N	%	
Years of Internet Accessibility:	0	0	28	12.8	0	0	88.108 .000*
One year	36	16.5	22	10.1	31	14.2	
Two years	59	27.1	41	18.8	1	0.5	
Three years							
Multimedia applications	0	0	62	28.4	32	14.7	148.506 .000*
Videos	63	28.9	29	13.3	0	0	
Carton	32	14.7	0	0	0	0	
Tv series							
Internet Access Devices:	0	0	7	3.2	9	4.1	118.452 .000*
TV	14	6.4	11	5	1	0.5	
Computer	4	1.8	16	7.3	7	3.2	
Laptop	56	25.8	57	26.1	0	0	
Smartphone	21	9.6	0	0	15	6.9	
Tablet							

*Significant :P<0.05

Table (7) Relation between pre-school level of internet addiction and the problematic technology use domains

Problematic technology use domains	Level of internet addiction						X ² P
	Mild		Moderate		Severe		
	N	%	N	%	N	%	
Continuity of use:							
Mild	4	1.8	0	0	0	0	10.188 .037*
Moderate	2	0.9	0	0	0	0	
Severe	89	40.8	91	41.7	32	14.7	
Effect on development							
Mild	95	43.6	91	41.7	32	14.7	-
Resistance to control:							
Moderate	95	43.6	45	20.6	32	14.7	81.367 .000*
Severe	0	0	46	21.1	0	0	
Deprivation escape :							
Moderate	79	36.2	14	6.4	16	7.3	85.394 .000*
Severe	16	7.3	77	35.3	16	7.3	

Discussion

The definition of digital addiction, which is described as "Overuse that is uncontrollable, irregular, and disruptive to everyday activities can lead to social and emotional issues," has changed recently to reflect the fact that it is not a substance addiction (Domof et al., 2020). Some experts claim that while adults are often able to manage activities that have the potential to become addictive, these types of addictions are more common in youngsters. Nevertheless, children lack the self-control skills that are required to regulate their conduct. According to a recent study, compared to other age groups, preschool-aged children and adults are more likely to acquire compulsive behaviors associated to smartphone usage (Csibi et al., 2021). So, the aim of the present study to determine the effect of implementing parental strategies on

preventing digital overdependence among their preschool children.

As regarding the sociodemographic criteria of pre-school children and parents, more than half of participant children aged 5 years old. Less than half of them ordered as the first birth and more than half of participant mothers aged 20-30 years old. The current study result resembling the result of Lu Cheng & Junwei Cao, (2023) who noticed that, more than half of the respondents mothers were 25–30 years old, children (125 male and 111 female) and 5 years old, this could be due to resembling of the sample of the two studies. In this respect, Waisman et al., (2018) reported that, mostly of sample were male children of ages 2-5 years old. However, in Egyptian study done by Mater & Bayoumy, (2019) reported that their

sample were with mean age of 2.05 years (1-6 years).

In contrast, **Mohamed et al., (2021)** found that one-third of their sample were first-born. Also, compared to other age groups, preschoolers are more likely to develop addicted behavior connected to smartphone usage, according to a new study (**Csibi et. al., 2021**).

The present study also showed that, slightly more than half of the participant fathers spent more than 4 hours daily on smart phones. While more than two quarters of the participant mothers spent 3-4 hours daily on their smart phones. In the researchers' point of view in order to regulate the time that preschool children spend playing digital games, it is important that parents control their daily use of smart phone and supervise their children.

The present study result is consistent with **Tang, (2021)** they reasoned that since preschoolers frequently imitate their parents' daily routines, parents' own use patterns could also have an impact on how their kids use digital media. Even though there aren't much actual research on this relationship at the preschool age, it makes sense to presume that kids will probably start using media more frequently than their parents do.

In relation to the criteria of over-dependence of digital devices among the pre-school children

Less than half of the total sample spent 3:4 hours per day on the internet. Less than half of them had 3 years of internet accessibility and slightly more than half divided into more than quarter of children at urban and rural areas had smart phone revealing significant difference between rural and urban children. This might be due to increase facilities and welfare in urban than rural population. The

present study result is in harmony with **Smahel et al., (2020)** They reported that, in the past 10 years, the number of preschoolers and teenagers who use digital screens—particularly smartphones—to access the internet has surpassed 80% in around eleven European nations, and the amount of time they spend online each day has increased from one to over two hours. In fact, according to **OFCOM (2021)**, 15% of preschoolers have access to their own mobile phone as early as age 3, and the usage of digital media devices, particularly smartphones and tablets, has increased among toddlers, preschoolers, and primary school students aged 0 to 8.

In the same vein, current studies have shown that children aged 0 to 8 are using and having more access to digital technology (**Ofcom, 2023**) and 2.4 hours were spent using screens on a daily average (**Radesky et al., 2020; Rideout & Robb, 2020**). Additionally, screen time rose for preschoolers in 12 nations throughout the epidemic. (**Bergmann et al., 2022**). Similar studies in Turkey shown that preschoolers see screens for more than three hours a day (**Konca, 2022; Şimşek et al., 2023**), this is more than the less than hour daily maximum that is advised for kids between the ages of two and four. (**Yesilay, 2023**).

In this respect, **Oka et al., (2021)** said that a higher risk of internet addiction has been linked to the impacts of urbanization on internet access, internet cafés, online gaming, outdoor or interactive activities, and family regulation and monitoring. The influence of urbanization on internet addiction is stronger than that of rural places because to the continuous COVID-19 epidemic, obesity, sleep issues, and the migration of parents to urban areas in pursuit of employment.

It is well recognized that parents, by controlling their children's access to digital gadgets, may effectively avoid addiction. As guardians of their children's surroundings, parents buy digital gadgets for them, including phones and tablets, let them use their own devices, encourage them to play video games on the internet, and set time and content limits (Budak & Işıkoğlu, 2023; Şimşek et al., 2023).

Regarding Physiological problems of preschool children related to digital overdependence

The current study found that, majority of the participant pre-school children had headache and unable to wake up early after periods of staying on smartphones respectively. Slightly more than three quarters of them had blurred vision. More than half had eye redness and unable to focus on small things. Half of them had a disturbed food intake and two thirds had lack of sleep periods, this might be related to extensive use of digital media that affect negatively on children's life.

The present study result is consistent with Janssen, et al., (2020) they found that a sedentary lifestyle, such as physical inactivity and poor eating habits, is linked to children's greater usage of digital media. Digital media usage too much, especially right before bed, might interfere with sleep cycles and result in poor quality sleep. Unrestricted access to age-inappropriate information can also expose kids to sexual content, violence, and other potentially hazardous stuff.

Moreover, Romer & Bushman, (2023) discovered that extended smartphone usage may have a number of detrimental impacts on kids' social skills, physical and mental health, and cognitive development. Excessive smartphone use has also been linked to visual impairment, restless nights, and

psychological reliance. Young children at preschool may not be exposed to real social interactions, such as those with other kids and adults in their immediate environment. Since many smartphone applications are made to be readily accessed and utilized, and to make switching between options to get fascinating information simple, they may also struggle with deep thought and focus. This could impair cognitive growth and academic success.

Likewise, Park & Park, (2021) added that, Preschoolers who use smart gadgets excessively may suffer major consequences to their physical and mental well-being. Preschoolers should be limited in their screen time to no more than one hour per day, according to the World Health Organization (WHO), since excessive screen time can negatively impact their behavior and health (WHO, 2019). When preschoolers watch media for more than an hour a day, their cognitive, linguistic, and social-emotional abilities deteriorate (Lin et al., 2020; Schwarzer et al., 2021).

Distribution of reported causes of digital overdependence related to pre-school children

The present study revealed that, more than three quarters of the total sample attributed their overdependence to connection with friends via internet this could be explained by loss of parental control over their children behavior. The present study result is not consistent with Scott et al., (2023) who made the report, Young toddlers in preschool frequently call their screen time "play." As a result, the idea of "digital play" has emerged, which is defined broadly as children using digital devices in playful ways. It also refers specifically to the use of technological tools like tablets and smartphones for play and

entertainment. Additionally, digital play is defined as a form of children's meaning-making within digital contexts. This may have to do with the two studies' dissimilar cultures and environments.

Indeed, more than half of the total sample attributed digital addiction to negative emotion to parents. This might be because those without stable attachment relationships to their parents may exhibit attachment reactions to easily accessible smart devices as a result of ongoing needs dissatisfaction. Overdependence is also increased when smart gadget use is not properly supervised. The current study result is consistent with **Lee, & Kim (2022)** who discovered that inconsistent response from parents—responding to the kid harshly at times and permissively at others—may lead to the development of a child's sense of insecurity, or insecure attachment, which may have repercussions that include addictive behaviors. People who have an insecure attachment are more likely to be emotionally unstable, respond inconsistently, and feel anxiety; as a result, they may get too attached to their smartphones as a way of making up for these shortcomings.

Also, **Jimeno, (2022)** reported that, the association between preschoolers' problematic smartphone usage in their early years and inconsistent parental media mediation was reduced by mother-child conflict resolution strategies, such as psychological hostility and physical assault. Restrictive mediation, however, substantially predicted children's lesser propensity to use problematic smartphones, even though it did not interact with either positive or negative mother-child conflict resolution strategies to explain children's problematic smartphone usage.

In the same context, **McDaniel & Radesky, (2020)** said that a child's externalizing tendencies may also be the cause of their smartphone addiction. Few research, nonetheless, have looked empirically at the psychological variables (such as social disengagement and sadness) that are related to their addiction to smart devices. Parenting stress and styles have a significant role in children's addiction to smart devices when it comes to caregiver issues. Research has also revealed a considerable correlation between preschoolers' excessive reliance on smart gadgets and mothers' poor parenting practices (such as overprotection, permissibility, rejection, and neglect) (**Lee & Kim, 2022**).

The current study results revealed that half of children attributed overdependence to cognitive dependence on smartphones. This result is congruent to **Park & Park (2021)**, preschoolers who use smart gadgets may have an addiction rate of one in five. Preschoolers are more likely to become addicted to smart technologies (such as smartphones and tablets) since their cognitive abilities are not as developed as those of adults.

Moreover, numerous associated characteristics that are linked to problematic media usage have been discovered in studies on preschool-aged children's addiction tendencies (**Dormof et al., 2020**). These factors involved parental attitudes (**Akaroğlu, 2022**), mediation of parental (**Budak & Işıkoğlu, 2023**), smartphone dependency on cognition, mother-child relationships, and parental screen addiction (**Li et al., 2022**), they can all have a role in the development of these traits.

As regarding the reported causes related to parents:

The present study showed that majority of the parents attributed their digital overdependence to transmission to online learning after occurrence of covid 19. This might be related to application of E- learning in teaching strategies after covid 19. This result resembles with **Hurwitz & Schmitt, (2020)** who stated that there are both advantages and disadvantages to digital play for preschoolers' learning and development. According to some research, educational games may help kids learn while also encouraging teamwork and problem-solving abilities.

In contrast, **Zhou et al., (2022)** reported that, fourteen percent of parents, their preschool-aged children are spending more time online and thirty-three percent are playing with computers or cellphones more regularly as a result of the COVID-19 epidemic. Time on its own, though, might not be a good indicator of children's problematic media usage. As with teenagers and adults, it becomes important to keep an eye out for behavioral changes as well, such as alterations in aggressiveness, impatience, or mood swings, which can be connected to a person's media consumption patterns and device-related experiences.

This result is not consistent with **Bergman et al., (2022) & Şimşek et al., (2023)** Turkey began implementing social isolation measures in March 2020 as a result of the COVID-19 epidemic. Following the relaxation of regulations in 2022, families and kids have gone back to their regular routines. Research carried out throughout this time frame has demonstrated that preschoolers utilized digital gadgets for a minimum of one hour longer each day in comparison to the pre-pandemic period.

Slightly more than three quarters of the participant parents attributed their digital

overdependence to accessibility of internet at home and slightly more than half of them attributed the overdependence to mother addiction. Risk variables that might be responsible for this include opportunity, susceptibility, and model hazards. Vulnerability risk includes indicators of tension in the home and at school (personal vulnerability leading to overdependence); model risk includes indicators of social role modeling such as mother addiction; opportunity risk includes indicators of opportunity such as internet accessibility at home.

The present study result is supported by **Güneş, (2022)** they discovered that a sizable portion of preschoolers are raised in cultures where a broad variety of digital gadgets are widely available to them and play a crucial role in their everyday lives. Preschoolers mostly utilize digital devices like computers, tablets, and smartphones for play and enjoyment, and their usage in homes, schools, and other social contexts has grown significantly in recent years.

In the same line, **Louv, (2020)** discovered that technology gadgets had ingrained themselves into daily life all around the world, with over two thirds of people using mobile phones and the internet (**Digital Report, 2022**). The lives of families have been significantly touched by the amazing rise of digital technology, especially those of preschool-aged children.

Regarding mean differences of Problematic technology use among preschool children before and after implementing related parental preventive strategies:

After implementing the preventive strategies: mean score ($3.55 \pm .20964$) of preschool children preference digital life than real life

turned to (2.44 ± 2.23973) after implementing the preventive strategies, spending time on technology instruments by watching movies or playing games that are not proper for his/her age turned from (4.28 ± 1.12393) to (3.14 ± 1.12528) spending time with technology instruments without fulfilling daily tasks was improved from (4.56 ± 2.20705) till (3.88 ± 2.21557) revealing a significant difference. This may be the result of parents employing these techniques to lessen the negative effects of media, establishing guidelines that restrict kids' internet time and giving them direct control over the content and activities they choose. In fact, active mediation—which entails actions like conversing with kids about media content and activities, keeping a close eye on them, and actively participating in their experiences—can help reduce preschoolers' reliance on technology.

The current study result is supported by **Domoff et al., (2019)** they said that, in order to limit preschoolers' overall screen time, smartphone use must be taken into account. First, for the ease of their charges, preschool-age caregivers need not to show their kids their iPhones. In order for kids to understand and respect the boundaries and follow them, parents who choose to give their kids cellphones must set clear, well-chosen, and constant boundaries.

In relation to mean differences of Preventive strategies of overdependence for parents of preschool Children before and after implementation

The current study revealed that the mean score of participants parent 3.51 ± 1.18793 replaced the electronic device use with other physical activities among their preschool children increased to (4.45 ± 1.43116) , indeed, the parent mean score of (2.11 ± 2.24751) who

made a list of things that must be done before device time among their preschool children increased to (5.06 ± 1.38545) . Moreover, mean score of parents who reduced device time gradually instead of stopping among their preschool children increased from (3.53 ± 2.22822) to (5.13 ± 1.34918) respectively, finally, the mean score of parents who participated their children in group activities and had fun with a group of friends improved from (1.60 ± 2.23399) to (4.23 ± 1.41096) after implementing related parental preventive strategies revealing

The present result is supported by **Xiang et al., (2023)** they discovered that physical activity, together with thoughtful kid exercise, may function as a significant intervention by encouraging relaxation and control of brain cells caused by digital overdependence. These findings suggested that spending more time engaging in physical exercise can considerably lower children's usage of electronic media.

Moreover, **Nichols & Selim, (2022)** discovered that preschoolers' online conduct may be effectively influenced by parents who use digital parenting techniques to mediate their kids' digital activities. When preschoolers spend time playing video games at home, parental techniques like progressively lowering gadget use and engaging in physical activities might help lessen their addiction.

The relationship between pre-school level of internet addiction and the socio demographic criteria of pre-school participant children and their parents there was a statistically significant relation regarding sociodemographic criteria of both participant pre-school children and their parents except in relation to residence, father job and income. The present study results are

not in harmony with **Al Mansoor, (2023)** who found that there is no statistically significant relationship between problematic internet use scores and sociodemographic characteristics, except for female gender and fair grades in the last year ($p < .05$). This could be attributed to different sample and culture.

The current study showed that 38.5 % of participant pre-school children with moderate addiction were aged 4 years ago and 28.4 % of them with moderate addiction ranked second birth order. In this respect **Schwarzer et al., (2021)** classified screen usage for more than one hour per day in preschoolers between the ages of two and five as screen overuse. Preschoolers who use smart gadgets excessively may suffer major consequences to their physical and mental well-being.

Indeed, 14.7 % of divorced parent had children with severe addiction due to parental separation and the child experience of separation anxiety disorders so become attached with smart phone to compensate the attachment figure. Overusing digital gadgets may be a fun way to escape from reality, and individuals often use their phones excessively to make up for not having any meaningful interactions in their lives. The present result is supported by **Anh. (2020)** who indicated that the average overdependence score of preschoolers with divorced parents is somewhat higher than that of preschoolers with married parents, although this difference is not statistically significant.

Also, 14.7 % of participant parents who spent more than 4 hours using smart phone had pre-school children with severe addiction due to learning behavior and modeling that preschool child acquire from their parents. In this respect, **Lee et al., (2022)** shown that children are likely to use cellphones excessively if parents do it to decompress

from being parents. Due to their early developmental stage, preschoolers frequently emulate their parents' actions. Consequently, we need to concentrate on parental aspects in order to address the issue of preschoolers being addicted to smart devices. Indeed, **Rai et al., (2022)** reported that, numerous studies have demonstrated a favorable correlation between preschoolers' screen usage and that of their parents, and excessive smartphone use by parents may cause children to exhibit similar behaviors.

Regarding relationship between pre-school level of internet addiction and the overdependence

There was a statistically significant relation between pre-school level of internet addiction and the years of internet accessibility as 14.2 % of preschool children with severe addiction had accessibility to internet from 2 years ago. Also, significant relationship between pre-school level of internet addiction and multimedia applications as 14.7 % of preschool children with severe addiction watched videos.

This result is in agreement with **Yang et al., (2022)** who classified children between the ages of two and five who used screens for longer than an hour a day as having screen overuse and accessibility issues. Preschoolers who use smart gadgets excessively may suffer major consequences to their physical and mental well-being. Moreover, **Hinkley & McCann, (2020)** who study parents of preschool-aged children in six European nations were surveyed, it was discovered that the majority of them admitted that their kids enjoyed viewing videos and that they were generally unconcerned with how much time their kids spent watching; for instance, there were no established guidelines for the inclusion of instructional content.

The relation between pre-school level of internet addiction and the problematic technology use domains

Finally, the current study found a significant relationship between pre-school level of internet addiction and the problematic technology use domains except regarding effect on development. This could be explained as when level of internet addiction increases the problematic technology use consequently increase. This result is consistent with the result of **Hussain & Starcevic, (2020)** who stated that, when internet technology is utilized excessively or in harmful ways, it disrupts daily life. There are risk factors for problematic internet usage, including indications of mental illness.

The present study result is supported by **Khalil et al., (2022)** they discovered that the intensity of online addiction was extremely substantially positively correlated with problematic technology use, internet gaming disorder grades, and problematic social media disorder grades.

In the present study, it was found that, 41.7 % of pre-school children who had moderate addiction were severely use technology on continuous bases. Also, 20.6 % of them who had resistance to control their technology use, had moderate level of addiction. This might be explained as a result of parental denial about problematic technology use and children refusal to control using technology and experiencing euphoria while participating in internet activities

Indeed, **Kim et al., (2020)** reported that, the number of research demonstrating the presence of problematic internet usage and gaming addiction has been sharply rising since the early 2000s, mostly as a result of people's ignorance about problematic technology use. Moreover, **Black et al.,**

(2020) added that, preschoolers who don't have parental supervision over how much time they spend online are more likely to spend more time online and playing games. The likelihood of developing an internet addiction increases with the amount of time spent online.

Conclusion

Based on the present study results, it was concluded that: 58.8 % of total sample divided into 26.2 % and 32.6 % of urban and rural residence respectively aged 5 years old, also 51.8% of the total sample divided into 26.6 % and 25.2 % of children at urban and rural areas respectively had smart phone revealing significant difference. 80.3% of the total sample divided into 45 % and 35.3 % of them stayed at urban and rural areas respectively attributed their overdependence to connection with friends via internet. (4.28±.12393) of participant children mean scores who spent time alone with technological tools turned to (3.07±.00839) of their means after implementing related parental preventive strategies, (1.83±.24154) of the participant parent mean scores replaced the electronic device use with other physical activities among their preschool children before implementation increased to (4.45±.43116) of their means after implementing related parental preventive strategies revealing significant difference. There was a statistically significant relationship between pre-school level of internet addiction and the problematic technology use domains except regarding effect on development.

Recommendations

- Extensive research and studies on the subject are needed to determine the true number of youngsters afflicted by internet

addiction and to understand more about its detrimental impacts.

- Large Large-scale research and studies on how to improve pre- school children development in relation to digital overdependence
- Schools should host lectures for both parents and children to raise awareness of the risks and detrimental effects of internet addiction.
- Encourage children to participate in activities, read books or stories at the library, and practice sports in the sports clubs.
- Group play is essential for children's mental and physical development.
- Parents ought to promote the positive applications of the internet, such as research and study, to their children.
- Regulation of the child's internet usage through the establishment of usage guidelines.
- Parents ought to designate a day without internet use.
- Smart devices, including computers, tablets, phones, and other gadgets, cannot be used by children less than six years old.
- Frequent check-ins with the school's psychologist and social workers to identify internet addiction cases early on. These instances are then sent to neuro-psychiatrists for treatment, as early intervention yields great outcomes.
- Adopting mass media campaigns is necessary to lower the likelihood of internet addiction.
- For children who are hooked to the internet, it is best to gradually wean them off it and replace it with other mental and physical activities.

- Parents should set a positive example for their children by spending more time with them and limiting their use of social media.

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