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Overdependence of Electronic Devices versus Physical Status in Preschool Children Aged from (3-6) years

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ABSTRACT

Background: The electronic device is one of the most widely used products among adults and kids alike. Nowadays, not a single child is unaware of smartphones. Compared to adults, they can occasionally use all of its applications more skillfully. Despite the fact that children shouldn't use smartphones for extended periods of time as this could harm their health. Preschoolers' physical condition and the effects of mobile devices is a topic of growing concern in today's society. Studies have indicated that a number of variables, including television viewing, parental self-efficacy perception, and the home environment, might affect young children's nutritional intake and physical activity levels. For example, television viewing has been linked to weight status in preschool-aged children, potentially affecting their physical activity levels and eating habits.

Objectives: This study aimed to assess overuse of electronic devices in preschool children aged from (3-6) years and assess overuse of electronic devices on physical status in preschool children aged from (3-6) years.

Methodology: A descriptive correlation quantitative approach is used. starting from November 9th 2023 to January 12th 2025 quantitative descriptive design was employed, with data collecting included selecting (132) child are selected form Maternal and Child Health Unit services (MCHs) in Primary Health Care Centers of Al-Najaf City, Iraq. Participants were selected based on specific criteria, including the children age group was between (3 to 6) years who attained primary health center for both North and South sectors during the time of data collection for the current study, the data collected from parents who being able to read and write. Participants who had excessive use of electronic devices more than half an hour. Children who use of touchscreen devices such as smartphones or tablet computers or mobile or T.V. Problematic Technology Use Scale for Young Children (PTUS-YC) and Physical status scale (visual discomfort index, musculoskeletal discomfort index) for the child were used to measure excessive use of electronic devices levels and physical status; data were collected to analyze potential correlations.

Results: The result of assessment of excessive use of electronic devices that showed mostly of preschool children (30.3%) have a high excessive use of electronic devices. While minimal physical discomfort (71.20%) impact on physical status of children as general, and minimal musculoskeletal index discomfort (72%), also minimal visual index discomfort (73.5%).

Conclusion: It was noteworthy that an important number of preschool children reported excessive use of electronic devices. Mobile devices were the most used. Children's discomfort symptoms were significantly correlated with excessive use of electronic devices, as noted in the study. The analysis revealed that there is a direct relationship between excessive electronic device usage.

Recommendations: Development of awareness programs and policies aimed at reducing the negative health effects of excessive electronic device use among children. Parents and guardians need to set specific rules for screen engagement for their children.

Keywords: *Electronic Devices, Physical status, Preschool Children (3-6 years)*

1. INTRODUCTION

The early years are an important time for physical, psychosocial, and cognitive development, with interventions during the preschool years play a significant part in shaping preschoolers psychosocial, behavioral, academic outcomes, Studies have

shown that anthropometric status and residential locality factors can impact cognitive scores in young children, emphasizing the need for interventions to promote growth and development in preschool-aged children (Ajayi *et al*., 2020). Computers, gaming consoles, tablets, and smart phones are a few instances of electronic devices. These electronics are utilized for pleasure, learning, and communicating with others (Tsang *et al*., 2023).

Preschoolers' physical condition and the effects of mobile devices is a topic of growing concern in today's society. Studies have indicated that a number of variables, including television viewing, parental self-efficacy perception, and the home environment, might affect young children's nutritional intake and physical activity levels. For example, television viewing has been linked to weight status in preschool-aged children, potentially affecting their physical activity levels and eating habits (Rachael Cox *et al*., 2012). Additionally, Parents' beliefs of their own efficacy are vital in encouraging preschoolers to engage in physical exercise behavior and eat healthily (Ayfer Ekim, 2015). Extended use of electronic devices has also been linked to a number of musculoskeletal problems, such as arm discomfort, lower back pain, and neck and shoulder pain, according to an expanding body of research (Kwok *et al*., 2017).

In addition, the most prevalent side effects of using a phone include headaches, earaches, warming sensations, and occasionally weariness and a perceived inability to concentrate. The widespread use of smartphones and the limited awareness of their potential drawbacks prompted numerous writers to begin investigating the impact of electronic technologies on children's well-being (Ali *et al*., 2019).

Objectives of the study:

1- to assess impact of excessive use of electronic devices status on preschool children (3-6 years).

2- To find out relationship between excessive use of electronic devices and physical status in preschool children (3-6 years).

Methodology

Study sample

The study was applied at Maternal and Child Health Unit services (MCHs) in Primary Health Care Centers of Al-Najaf City, with a purposive sample of (132) child is selected form those who visits and benefited of Maternal and Child Health Unit services (MCHs) in Primary Health Care Centers of Al-Najaf City. The participants selection criteria were as follows: The children age group was between (3 to 6) years who attained primary health center for both North and South sectors during the time of data collection for the current study. Data collected from parents Being able to read and write. Participants who had excessive use of electronic devices more than half an hour. Children who use of touchscreen devices such as smartphones or tablet computers or mobile or T.V. The exclusion criteria were as follows: The participant who refused to given consent in sharing of the present study. Individuals who participate in the study have no history of chronic disease and psychiatric or neurologic disorders. Children who have post-operative patients. The children who had history of any previous surgical procedure. Patients who met the inclusion criteria were informed about the purpose and procedure of the study and confidentiality was assured. Before collecting data, we obtained approval from the Ethics. The study was carried out from November 9th 2023 to January 12th 2025

Research Design

A descriptive correlational approach study design will be adopted to explore impact of excessive use of electronic devices on physical status in preschool children.

A sample size of (132) child will be determined using appropriate statistical methods. Purposive sampling will be used to recruit participants, ensuring representation from diverse demographics within the target population.

Data Collection Tools: Problematic Technology Use Scale for Young Children (PTUS-YC) is a validated tool to measure an excessive use of electronic devices levels. Items of the instrument were grammatically correct and easy for the reader to understand, every child parent should answer these questions with one of the choices, A 5-point Likert scale was constructed for measuring according the following: (Completely Disagree=1, Somewhat Disagree=2, Undecided=3, Somewhat Agree=4, completely Agree=5), (Konca, 2022), The scale does not require special permission for use, as it is a globally recognized and publicly accessible measurement tool. Physical status scale (musculoskeletal discomfort index, visual discomfort index) to measure physical status deterioration.

Musculoskeletal Discomfort Index

Participants were investigated for the frequency and severity of four identified musculoskeletal symptoms while and after using electronic devices (Supplementary material). A 4-point Likert scale was constructed for measuring the presence and frequency of symptoms: 0: "Never: There is no occurrence of the symptom at all"; 1: "Occasionally: Has some episodes or at most once per week"; 2: "Frequent: two to three times weekly"; 3: “Always: Almost every day or each week.”

The severity of symptoms, when present, was subjected to a 3-point Likert scale:

• Mild: "The symptom is perceivable but not uncomfortable."

• Moderate: "The symptom is somewhat distressful and may warrant a break."

• Severe: “The symptom is very distressing and requires self-care or medical treatment.” The four musculoskeletal symptoms measured were pain, aches, stiffness, or fatigues in the 1) neck, 2) shoulders, 3) back, and 4) regions of upper limbs with sensations of pins and needles or numbness.

Visual discomfort index include:

The same questions used to evaluate musculoskeletal complaints were also used to determine the presence, frequency, and severity of seven visual symptoms. Eye dryness, burning, itching, redness, pain, blurred vision, and trouble concentrating for close-up vision were among the symptoms selected for evaluation because they were linked to CVS. Every child parent should answer these questions with one of the (Never, Occasionally, Frequent, Always). For combined (A-Musculoskeletal discomfort index & Visual discomfort index), Range 0-33, 0-8 minimal discomfort, 9-16 mild discomfort, 17-24 moderate discomfort, 25-33 severe discomfort.

Sociodemographic Data Form: form will collect information such as age of child, sex, screen time per day, monthly income of family, birth order of children in the family, number of siblings, type of family.

Data Analysis

Quantitative data will be analyzed using SPSS. Descriptive statistics (mean, median, standard deviation) will summarize sociodemographic data. A p-value of <0.05 will be considered statistically significant**. Inferential Data Analysis Approach included: I.** Internal consistency by estimate Cronbach Alpha for the reliability of questionnaire.

II. Correlation Coefficient to estimate the relationship between excessive use of electronic devices, physical, and psycho-social status in preschool children.

III. Tests of Normality by using Shapiro-Wilk.

IV. Kruskal-Wallis H test and Mann-Whitny U test to test relationship between child demographics data and excessive use of electronic devices and, relationship between parental demographics data and excessive use of electronic devices in relation.

2. RESULTS

Table 1. Demographic characteristics of the study sample.

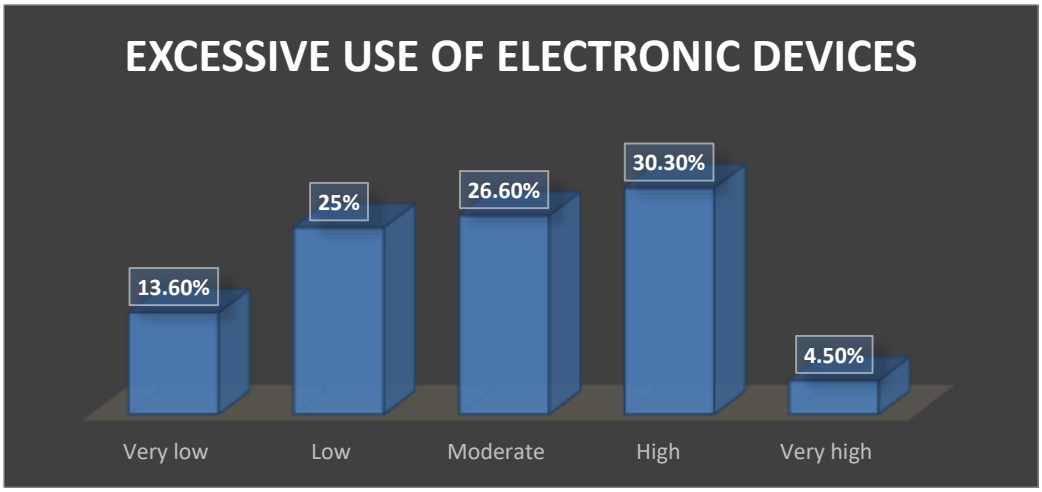
		Frequency	Percent
Age of child	3	25	18.9
	4	39	29.5
	5	68	51.6
	Total	132	100.0
Sex	Male	81	61.4
	Female	51	38.6
	Total	132	100.0
Screen time per day	hours		
	(< 1 hour)	28	21.2
	(1-2 hours)	43	32.6

		Frequency	Percent
	(2-3 hours)	30	22.7
	(3-4 hours)	20	15.2
	(>4 hours)	11	8.3
	(Total)	132	100.0
Monthly Income of family	Sufficient	62	47.0
	Sufficient to some extent	56	42.5
	Insufficient	14	10.6
Total		132	100.0
Birth order of children in the family	First	41	31.1
	Second	48	36.4
	3+	43	32.6
	Total	132	100.0
Number of siblings	0	17	12.9
	1 Sibling	43	32.6
	2 Siblings	42	31.8
	3+ siblings	30	22.7
	Total	132	100.0
Type of family	Nuclear	84	63.6
	Extended	48	36.4
	Total	132	100.0

Table 2. Responses regarding excessive use of electronic devices in preschool children.

	Completely Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Completely Agree	Total	Mean	SD
My child spends an average of more than 1.5 hours a day with technological tools.	22	9	16	50	35	132	3.51	1.39
My child exceeds the time limit we have set for technology use.	29	16	14	46	27	132	3.20	1.46
My child often expresses a desire to spend time with technological tools.	21	23	17	51	20	132	3.20	1.33
There is a significant time increase between my child's early and present technology use.	24	25	21	39	23	132	3.09	1.38
My child starts to spend time with technological tools without fulfilling daily responsibilities.	35	25	15	44	13	132	2.81	1.39
My child experiences negative emotions when he/she is not spending time with technological tools.	36	16	14	51	15	132	2.95	1.43
My child experiences positive emotions when he/ she starts to spend time with technological tools.	16	23	21	57	15	132	3.24	1.23
My child relaxes by spending time with technological tools when he/she feels sad.	17	19	23	58	15	132	3.27	1.22
My child thinks about technological tools even when he/she is not spending time with them	35	16	27	45	9	132	2.83	1.33
My child prefers to spend time with technological tools instead of spending time with us or with his/her friends	35	24	15	46	12	132	2.82	1.39
My child spends time on technological tools by playing games or watching movies that are not suitable for his/her age.	54	14	17	36	11	132	2.52	1.46
My child's technology use makes him lonely.	51	19	18	34	10	132	2.49	1.42
My child prefers playing games on technological tools to playing games in real life.	36	11	14	51	20	132	3.06	1.48
My child does not want to go to school because he/she wants to spend his/her time with technological tools.	63	15	17	32	5	132	2.25	1.37

	Completely Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Completely Agree	Total	Mean	SD
My child spends time alone with technological tools	40	16	21	38	17	132	2.82	1.46
My child's use of technological tools negatively affects his/her interaction with his/her environment.	31	14	17	48	22	132	3.12	1.44
My child's use of technological tools causes problems in his/her language development.	53	12	20	30	17	131	2.59	1.52
My child's use of technological tools has decreased the duration of his/her sleep.	31	18	24	41	18	132	2.98	1.39
My child eats/wants to eat while spending time on technological tools.	46	18	16	40	12	132	2.65	1.45
My child's use of technological tools makes him/her sedentary.	36	23	22	35	16	132	2.79	1.41
My child spends time with technological tools just before going to sleep.	50	23	16	27	16	132	2.52	1.47
I have disagreements with my child about the duration of his/her technology use.	35	24	6	38	29	132	3.02	1.56
My child does not tell us or lies about what he/she is doing while using technology tools.	49	18	23	29	13	132	2.54	1.43
My child tries to use technological tools secretly, although we limit his/her use of technology.	37	26	23	32	14	132	2.70	1.38
My child is annoyed when we try to communicate with him/her while spending time with technological tools	39	14	19	38	22	132	2.92	1.5
My child does not allow us to track his/her technology use.	49	15	17	31	20	132	2.68	1.54

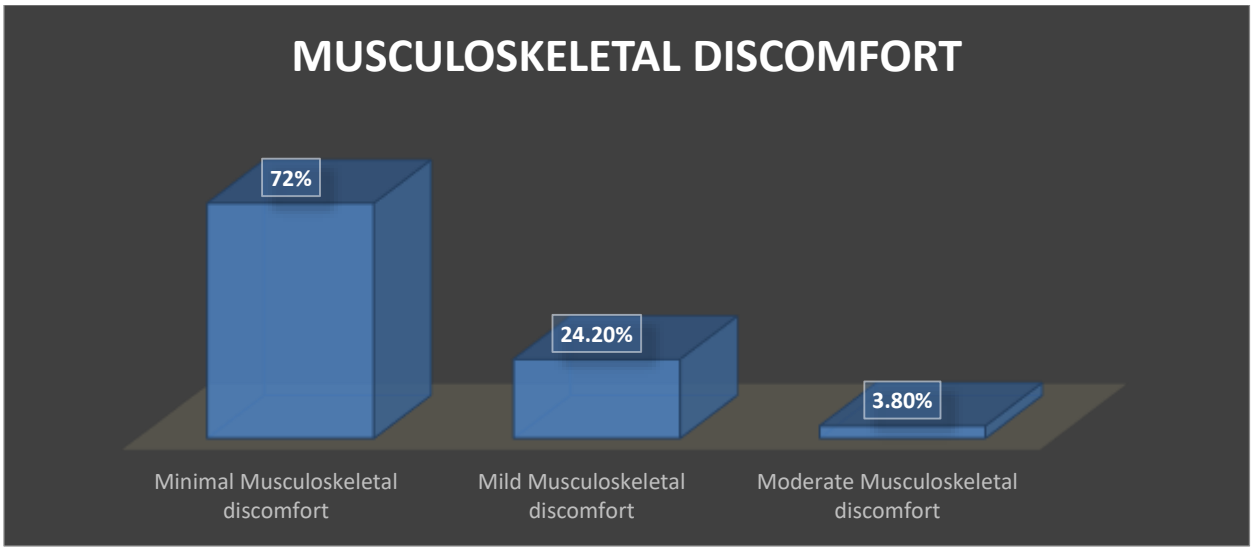


Very low= (1-1.79), Low= (1.8-2-59), Moderate= (2.60-3.39), High= (3.4-4.19), Very high= (4.2-5)

Figure.1: Overall percentage of excessive use of electronic devices in preschool children

Table.3: Responses regarding physical status of the child

Musculoskeletal discomfort index	Never	Occasionally	Frequent	Always	Total	Mean	SD
Pain or aches, stiffness or tiredness in the neck	80	45	4	3	132	.47	.670
Pain or aches, stiffness or tiredness in the shoulder	89	26	13	4	132	.48	.796
Pain or aches, stiffness or tiredness in the back region	85	28	13	5	131	.53	.826
Feelings of pins and needles or numbness in the upper limbs	79	28	17	8	132	.65	.925

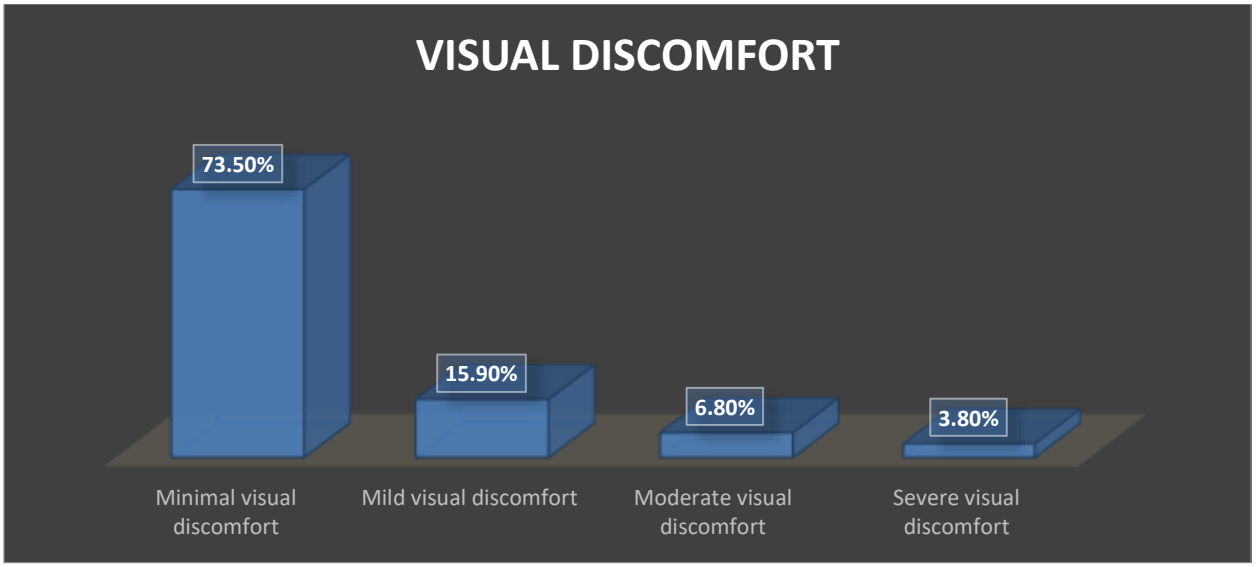


Minimal = (0-3), Mild = (4-7), Moderate= (8-10), Severe= (11-12)

Figure 2. Overall Musculoskeletal discomfort index

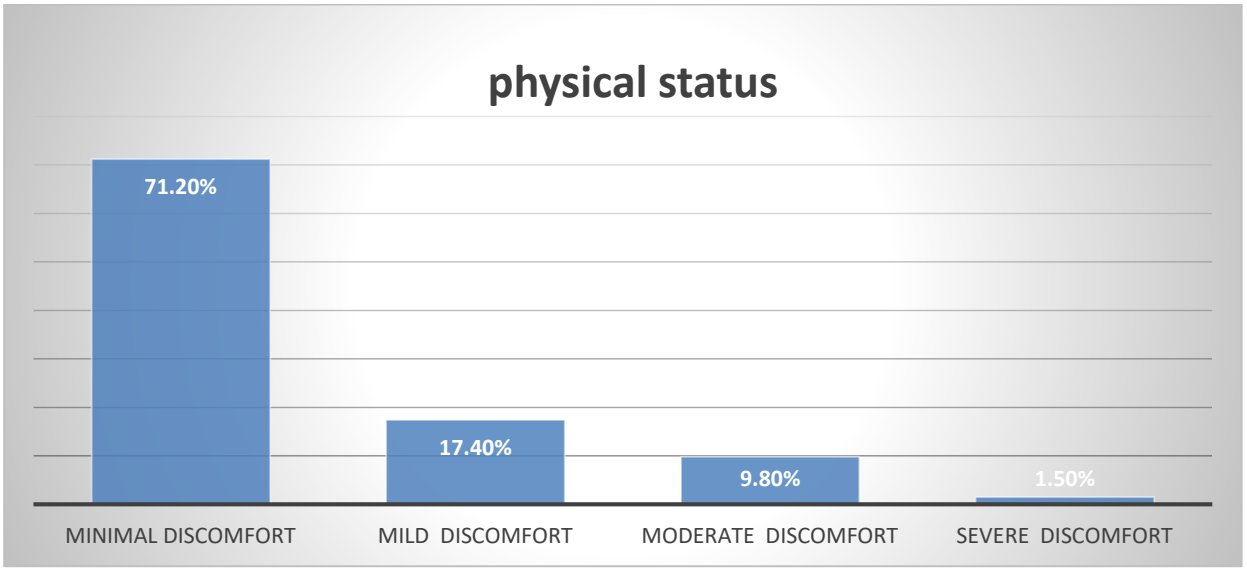
Table 4. Responses regarding visual discomfort index

	Never	Occasionally	Frequent	Always	Total	Mean	SD
Eye dryness	86	29	10	7	132	.53	.851
Eye burning	74	42	9	7	132	.61	.837
Eye itching	77	31	18	6	132	.64	.884
Eye redness	74	40	12	6	132	.62	.834
Eye pain	81	33	11	7	132	.58	.857
Blurred vision	91	27	10	4	132	.45	.765
Difficulty focusing for near vision	83	31	13	5	132	.55	.823



Minimal =(0-5), Mild =(6-10), Moderate=(11-15), Severe=(16-21)

Figure 3. Overall visual discomfort index



Minimal =(0-8), Mild =(9-16), Moderate=(17-24), Severe=(25-33)

Figure 4. Overall physical Status index

3. DISCUSSION

Part One: Discussion for Child Demographical Data Characteristics:

Regarding the age, the age was half of participants have five years regarding the extent of media use among young children. These children are growing up in a media-saturated environment with almost universal access to television, and a striking number have a television in their bedroom. Media and technology are here to stay and are virtually guaranteed to play an ever-increasing role in daily life, even among the very young.

Additional research on their developmental impact is crucial to public health. Recent studies in Iraq have highlighted various health concerns among preschool children, (Al-Mendalawi, 2024). These findings underscore the need for comprehensive, culturally sensitive healthcare interventions for preschool children in Iraq.

As regards gender in the current study, for children using electronic devices, there is a majority of males about two thirds of the samples were male while a quarter were female; Boys constantly detected a higher frequency using devices. Current

results show that males are more common than females. Preschool-aged males are more likely than girls to use electronics, according to research, (Unplagan *et al*., 2018). While girls participate in a greater range of digital activities, such as painting and communicating, boys are more likely to choose video games (Bukhalenkova *et al*., 2023).

Being an only kid, having a mother who works, and having a father with more education are all factors linked to increasing smartphone usage. Sixty percent of children use electronics for more than an hour every day, which is a large percentage of youngsters who exceed suggested screen time restrictions (P. Rathnasiri & Jayasena, 2022).

Overuse can result in health issues and inadequate sleep, which may have an impact on academic achievement, Experts advise limiting media exposure to less than an hour each day in order to allay these worries, and they stress the value of parental supervision and assistance in teaching kids how to use technology responsibly (Levenson *et al*., 2016).

The highest percentage was from (1-2) hours of time screen per day, representing more than quarter of the total participants, The entry of modern technology into our society in recent years has contributed to the creation of a new generation of children addicted to its use, especially the Internet. Despite the many benefits that networks provide to millions of people around the world, they represent a real danger if used excessively, especially by children and young people.

Preschoolers' excessive screen usage is a rising worry, according to recent studies. Most preschoolers go above the suggested daily limit of one to two hours(M. Musa et al., 2023).

Having a personal device, being male, and being older than two years are factors linked to greater screen time. Numerous behavioral and cognitive problems have been connected to excessive screen use. Youngsters who watch for more than two hours a day are far more likely to get inattention issues and symptoms similar to ADHD (Tamana *et al*., 2019). Furthermore, irregular parental control of screen use is linked to possible attention, IQ, and social skill deficiencies (Elumalai *et al*., 2021).

Addiction to the Internet and smartphones represents one of the manifestations of personality problems, and this may represent a preliminary stage for moving into the world of psychological disorders and complications. most studies have confirmed that using these devices for more than half an hour a day can affect the child, and this effect is often negative. Some of these studies are, (von Wyl *et al*., 2022), and (G. M. Ibrahim et al., 2022), in contrast, study reveal advantages of using the devices within the time that are less than half an hour (Wang, 2024).

Components of living and is one of the basic points in life. According to the study data, the adequate monthly income, which came in first place. Therefore, the good income of the family may be reflected negatively and the families with a good income have the means to provide everything for children, including electronic devices and games, this indicates that families with insufficient income are unable to provide everything for children, and according to (Kaur *et al*., 2019), The burden of screen-time can reach to 93.7% in the high-income countries

Regarding birth order of children in the family, the second child occupies the highest percentage, this result indicates that the first child is the child with the most interest, while the second child has less desire and eagerness. Therefore, to make the child calm and get rid of his disturbance, the parents are given electronic devices as a kind of means of comfort for the child the same thing was found in the study of (Nhandi, 2017), The study reveals that middleborn have been more represented than the firstborns.

Families with two children, ranked first. These families indicate that children, especially the second child, use electronic devices as a means of distracting children and getting rid of their annoyance and excessive movements this is agree with the study done by (Siibak & Nevski, 2019).

Numerous screen technologies intended for personal and domestic use have an impact on today's home environment, making family members viewers of the widespread technologies, nuclear families, which live with only a father, mother and children, are the highest percentage in the study. This indicates that single families do not have enough to prevent children from using electronic devices a lot, unlike families living with grandparents and other families, where the use of electronic devices is less because the child is busy with other children, as they are busy with games, dealing and communicating this study is compatible with study by (Duckert & Barkhuus, 2021).

Part Two: Discussion of Problematic Technology Use of Electronic Devices in Preschool Children.

The results revealed that children use electronic devices “high” percentage consider as a one third of a sample, according to these result the mostly of preschool have a high excessive use of electronic devices, these compatible with the studies that are conducted by (I. A. Ibrahim, 2022; H. Musa et al., 2022; Xiang et al., 2022)

According to recent surveys, between ninety-one and ninety-s of preschool-aged children use electronic devices, The most widely used devices are televisions and smartphones (Al-Mehmadi et al., 2024).

According to the figure 1. show the percentage of excessive use of electronic devices in preschool children, Children’s daily screen time was reported by their parents using the following questions: “On an ordinary workday, how many hours does your kid spend using the computer, tablet, phone, TV, or e-reader? On an average weekend day, how many hours does your child spend using these devices? 5× daily screen time on weekdays plus 2× daily screen time on weekends was used to

compute the average daily screen time, which came out to be /7. Additionally, we divided daily screen usage into two groups: moderate (≤ 1 hour per day) and excessive (>1 hour per day). according to previous guidelines ((WHO, 2019), and studies (Xie et al., 2020; Zhu et al., 2020).

Many kids spend more time on screens than the one hour that is advised each day, particularly on the weekends, Device usage is typically permitted by parents for enjoyment and educational reasons (Nathan *et al*., 2022). However, more screen usage is linked to a number of mental health conditions, including as ADHD, emotional disorders, and behavioral disorders. Being an only kid, the mother's job, and the parents' educational attainment are all factors that affect the use of technology (A. Rathnasiri *et al*., 2022).

Part Three: Discussion regarding physical status of the child.

Figure.2. show that less than three quadrants of preschool have a minimal musculoskeletal discomfort Minimal. According to research, children and adolescents who use technological devices excessively are more likely to experience musculoskeletal pain, visual complaints, and psychological problems (Tsang *et al*., 2023). Children frequently express discomfort with a variety of activities, such as using computers and playing video games (Iacovides & Mekler, 2019).

Long-term use of electronic games, particularly small portable devices, greatly raises the risk of physical pain, with the most prevalent areas being the neck, shoulders, and hands (Toh *et al*., 2017). Children's perceptions of discomfort-causing variables, including poor posture and excessive activity, typically mirror scientific understanding of risk factors. These results emphasize how crucial it is to keep an eye on and restrict kids' use of electronics in order to avoid musculoskeletal disorders and other health problems (Lazić et al., 2021).

Responses regarding visual discomfort index.

Additionally, Figure. 3. indicated that less than three quadrants of preschool have a minimal visual discomfort.

Concerns regarding the effects of electronic device use on preschoolers' visual and cognitive development have been brought to light by recent studies. Reduced lacrimal volume and an increase in visual symptoms including light sensitivity and eye burning have been linked to increased screen time's detrimental effects on visual function (Al-Mohtaseb *et al*., 2021). Children's asthenopia symptoms have also been connected to prolonged screen use (>2 hours per day) ((Gomes & Franco, 2024).

Additionally, preschoolers who use digital media more often had worse Full Scale IQ scores and visual-spatial skills, Children's screen time has grown and their outside activities have reduced as a result of the COVID-19 pandemic (Keefe-Cooperman, 2016).

Even when they confront challenges, young children are nevertheless driven to utilize intelligent devices in spite of these worries. Experts advise striking a harmony between outdoor activity and screen time to encourage good visual development and lower the incidence of myopia (Lanca & Saw, 2020).

Overall physical status of the preschool children:

Figure 4. Show that less than three quadrants of preschool have a minimal physical discomfort. Preschoolers and elementary school students often use electronic devices, according to research, with some using small handheld gadgets for more than two hours per day. Physical discomfort from this use is possible, especially in the fingers, shoulders, and neck. Children's perceptions of the reasons of discomfort frequently mirror scientific findings, attributing it to bad posture and overuse (Eitivipart *et al*., 2018).

Using electronics in dark environments or when lying down are two examples of factors that might raise the risk of physical problems. The use of electronic devices is also linked to behavioral problems, such as a decline in interest in academic pursuits and outdoor activities. These results emphasize how crucial it is to keep an eye on kids and teach parents about responsible use of electronics (Huang *et al*., 2020).

4. CONCLUSION AND RECOMMENDATION

Conclusion:

1- Excessive Use of Electronic Devices: Notable findings indicate that a considerable number of preschool children (30.3%) reported high levels of excessive usage of electronic gadgets. Mobile devices, especially YouTube, were the most utilized. Even children as young as 1-2 years old were reported to actively use electronic devices, showing that they have early exposure to technology.

2- Physical Health Implications: The study noted that excessive usage of electronic devices was significantly correlated with discomfort symptoms among children. Overall issues reported were musculoskeletal pain, which was most prevalent in the neck, shoulders, and back, as well as psychological issues such as eye dryness, burning and itchy sensation. Interestingly, 72% of children reported having “a little bit” of musculoskeletal pain, while 73.5% stated having “somewhat” of visual discomfort as well.

Recommendation

1- Excessive screen time also means lack of physical activities and outdoor play, which children have to be motivated to undertake. This is done in order to reduce the adverse effects of screen time. They need to be active to get relief from musculoskeletal and visual problems.

2- Parents need to supervise what their children are viewing on electronic devices. Age-sensitive topics need to be given priority and the parents should know what applications and games their children are using.

3- It's important to urge parents to spend time with their kids doing things that don't require screens. This can enhance parent-child connection and lessen the need for technological devices for enjoyment.

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