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Media use and behavioral disorders among Saudi Arabian children

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Salmah Alghamdi^{1*}, Duaa Bawageeh², Hessa Alkhaibari², Amwaj Almutairi², and Shoug Aljuhani²

Abstract

Background: Despite children's frequent use of electronic devices, there is a lack of evidence showing how such media use influences their behavior.

Objective: This study was to assess the relationship between media use and behavior among a sample of children aged three to 11 years.

Methods: This was a descriptive cross-sectional study. An electronic self-administered questionnaire was completed from January 2020 to March 2020 by a convenience sample of 234 parents with healthy children in the target age group. Descriptive statistics and One-Way Analysis of Variance (ANOVA) were used for data analysis.

Results: There was no significant difference in children's behavior according to the type of media [$F(3, 230) = 1.673, p = 0.174$]. In contrast, there was a significant difference in children's behavior according to hours per day of media use [$F(4, 229) = 2.701, p = 0.031$]. The most commonly used mobile device was the smartphone ($n = 87, 37.2\%$). More than a quarter of the children spent three hours a day using media.

Conclusions: This study offers insight into associations between children's frequent media use and their behavior. The results suggest that the significant factor associated with behavioral problems is not the type of media but the time spent using it. Nurses are encouraged to use these findings in developing educational programs that raise awareness among parents and children regarding the consequences of excessive media use.

Keywords

behavioral problem; smartphone; children; media; nursing; Saudi Arabia

Currently, individuals of all ages use media extensively to find information and connect with others all over the world (Zupanich et al., 2019). In this context, the term *media* refers to smartphones, videogames, tablets, game consoles, televisions, and computers. While media use can be favorable within certain limits, there is a risk of overuse. Indeed, the time spent using electronic devices continues to increase along with the growth in the range of available technologies. Media use among children has become a growing concern. The American Academy of Pediatrics (2016) recommends that children between age two and five years use media for only one hour a day, and children between six to 10 years use it for only 1.5 hours per day. Despite this recommendation, in Australian households, children's device use and internet access have risen from

72% in 2004–2005 to 97% in 2016–2017 (Reus & Mosley, 2018). Children's media use also has become a concern in Saudi Arabia. With the growing affordability of mobile devices, research has shown that the average time Saudi Arabian children spend using mobile devices was about two hours and 42 minutes (Statista Research Department, 2020). Furthermore, the number of internet users in Saudi Arabia is growing steadily, from 21.54 million in 2015 to 30.2 million in 2019 (Statista Research Department, 2020). This number is expected to reach 35 million in 2023 (Statista Research Department, 2020). Moreover, according to the General Authority of Statistics, 92.51% of Saudi families and 23.44% of children between five and nine use the internet (Al-Solami, 2019).

¹Maternity and Child Health Department, Faculty of Nursing, King Abdulaziz University, Jeddah, Saudi Arabia

²Faculty of Nursing, King Abdulaziz University, Jeddah, Saudi Arabia

Corresponding author:

Dr. Salmah Alghamdi

Faculty of Nursing, King Abdulaziz University, Jeddah, Saudi Arabia

P.O.BOX 4105, Zipcode 22254

Email: saalghamdi6@kau.edu.sa

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Such high media use among children can come at a cost. Studies have shown that children with more media usage have a higher body mass index (BMI), less physical activity, and diminished rest and sleep than children with lower media usage (Reus & Mosley, 2018). Media use also can influence children's behavior. For example, children can become physically and verbally aggressive after excessive media use, sometimes imitating violent behaviors portrayed in mass media (Şengönül, 2017; Tanwar & Priyanka, 2016). The assessment of children's behavior in this study comprises a wide range of mental and social disorders. They include depression, overanxious, separation anxiety, relational aggression, oppositional defiant, inattention, impulsivity, and social problems with peers. Unfortunately, there is a lack of evidence about the specific relationship between media use and behavioral disorders in Saudi Arabian children. Therefore, the current study focused on Saudi children aged three to 11 years.

With portable digital devices (e.g., smartphones and tablets) becoming more available and affordable, the time children spend using them is increasing rapidly (American Academy of Pediatrics, 2013). In addition, with the significantly accelerated growth of video apps, learning packages, and instructional software for young children, incentives for children to use mobile devices have expanded, resulting in longer usage periods. Furthermore, mobile device manufacturers are targeting younger children. With this widespread increase in children's access to and usage of digital mobile devices—which has become an integral part of their lives—parents and researchers need to examine the effects of portable electronic media use (Paudel et al., 2016). Therefore, the current study aimed to determine if there is a relationship between media use and changes in children's behavior.

Researchers have suggested that frequent mobile media usage among children can intensify social loneliness, detract from social contact with family and friends, exacerbate emotional/behavioral issues, and possibly worsen social deficits (e.g., inattention, hyperactivity, peer problems, and emotional symptoms) (Hosokawa & Katsura, 2018; Poulain et al., 2018; Wu et al., 2017). Interestingly, other researchers found no correlation between device use and mental and behavioral problems in girls, while in boys, each hour spent playing video games was correlated with higher chances of exhibiting borderline/abnormal conduct problems and emotional issues (Mundy et al., 2017). Furthermore, increasing media use also has been shown to negatively affect sleep outcomes, resulting in more bedtime resistance, later bedtimes, and shorter sleep durations (Chindamo et al., 2019; Nathanson & Beyens, 2018; Wu et al., 2017). Moreover, longer TV watching periods have been linked to an increased likelihood of future self-regulation issues, while less television consumption is correlated with improved self-regulation (Cliff et al., 2018; Inoue et al., 2016). In contrast, one study showed that tablet usage contributed adversely to self-regulation only in children who

slept less at night (Nathanson & Beyens, 2018). Another study indicated that high levels of media consumption contribute to high BMIs and have a detrimental effect on athletic behaviors and motor abilities (Kaiser-Jovy et al., 2017). Finally, the aggressive behavior common in the media (especially in superhero programs) also can influence children's behaviors. A study showed that one year after pre-school children encountered superheroes via media, these children exhibited increased physical and emotional violence (Coyne et al., 2017). However, superhero engagement was not shown to be related to prosocial or defensive behaviors (Coyne et al., 2017).

Methods

Study Design

This was a descriptive cross-sectional study.

Participants

G*Power was utilized to calculate the needed sample size for this study (Faul et al., 2009). A priori analysis was employed to estimate the sample size for one sample means. The input parameters (alpha 0.05, power 0.80, and medium effect size 0.5) resulted in a recommended sample size of 67. The study's participants were a convenience sample of Saudi Arabian parents with healthy children between the ages of three to 11 years. The participants were the parents of children; thus, the ages of children who use media under the control and supervision of their parents were determined for the purpose of this study to be between three to 11 years. The study did not include individuals who were not parents or those with children under age three, over age 11, not exposed to media, or experiencing a medical problem.

Instrument

The data were collected through an electronic survey created in Google Forms and shared through social media from January 2020 to March 2020. The authors of this study developed the first and second parts of the questionnaires. The first part of the questionnaire consisted of 10 items about sociodemographic factors: parent gender, age, marital status, employment status, number of individuals living in the household, monthly income, and education level, as well as child gender, age, and education level. The second part included multiple-choice questions about the child's media use (the type of media used and time spent using it). The last part consisted of items adopted from the parent version of the MacArthur Health and Behavior Questionnaire (HBQ) for middle childhood (Essex et al., 2002). The HBQ includes scales that assess children's mental health symptoms, physical health, social and school functioning. For the purpose of this study, only 44 items of HBQ addressed children's behaviors with regard to mental health symptoms (depression, overanxious, separation anxiety, relational aggression, oppositional defiant, conduct problems, overt hostility, inattention, and impulsivity) and social functioning (a social with peers and

prosocial behavior) were included. The HBQ requires the participant to check on the statement that applies to the behavior. The statements were assessed on a 3-point scale ranging from 0 (never or not true) to 2 (very true). The questionnaire was translated from English to Arabic using the back translation method, and the translated Arabic questionnaire was pilot-tested with five parents to ensure the clarity of items. To establish content validity, five Arabic-speaker specialists, including two doctoral-prepared and three master-prepared nurses in the field of pediatric nursing, evaluated the translated version of the HBQ and the relevance of the items to the concept of health and behavior. The HBQ (44 items) in this study demonstrated good internal consistency reliability with a Cronbach's alpha of 0.88.

Data Analysis

Data were analyzed using SPSS software. Descriptive statistics (e.g., mean, percentages, frequencies, and standard deviation) were used to describe the study variables. One-Way Analysis of Variance (ANOVA) was employed to assess differences in children's behavior

according to type and time of media use. The level of statistical significance for statistical analysis was at 0.05.

Ethical Consideration

Ethical approval was obtained from the Nursing Research Ethical Committee (NREC Serial No: Ref No 2B. 37). The study maintained participant confidentiality, and the parents' identities were not evident in any reports, presentations, or publications. Electronic informed consent was obtained from all participants before starting the questionnaires.

Results

In total, 234 parents participated in the study. The majority of study participants (93.2%) were mothers between 30 and 50 years (78.2%). Most of the children (60.3%) were between five and ten years of age. Details on the other demographic variables are shown in Table 1.

Table 1 Demographic variables of the study sample (N=234)

Variables		N	%
Parents	Mother	218	93.2
	Father	16	6.8
Participants' age	Less than 30 years	41	17.5
	From 30 to 50 years	183	78.2
	More than 50 years	9	3.8
Child's age	From 3 to 5 years	85	36.3
	From 6 to 8 years	105	44.9
	From 9 to 11 years	44	18.8
Sex of Child	Male	107	45.7
	Female	127	54.3
Marital status	Married	226	96.6
	Divorced	6	2.6
	Widowed	2	0.9
Employment status	Working full-time (35 hours per week)	80	34.2
	Working part-time	28	12.0
	Student	8	3.4
	Not working	118	50.4
Household	Less than five persons	125	53.4
	From five to ten persons	107	45.7
	More than ten persons	2	0.9
Household monthly income in Saudi Arabian Riyal (SAR)	SAR 3000 or Less	21	9.0
	SAR 3001–SAR 8000	73	31.2
	SAR 8001–SAR 13000	67	28.6
	More than SAR 13000	54	23.1
	Don't know	19	8.1
Educational level	Below high school	16	6.8
	High school	60	25.6
	Some college	14	6.0
	Bachelor's degree	130	55.6
	Master's degree or higher	14	6.0
Child's educational level	Kindergarten	59	25.2
	Grade 1	52	22.2
	Grade 2	31	13.2
	Grade 3	22	9.4
	Grade 4	31	13.2
	Not enrolled	39	16.7

As presented in Table 2, the results of One-way analysis of variance (ANOVA) revealed that there was no significant difference in children's behavior according to the type of media [$F(3, 230) = 1.673, p = 0.174$]. In contrast, there was

a significant difference in children's behavior according to hours per day of media use as presented in Table 3 [$F(4, 229) = 2.701, p = 0.031$].

Table 2 One-way ANOVA of children behavior by type of media use

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	0.334	3	0.111	1.673	0.174
Within Groups	15.305	230	0.067		
Total	15.639	233			

Table 3 One-way ANOVA of children behavior by hours per day of media use

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	0.705	4	0.176	2.701	0.031*
Within Groups	14.934	229	0.065		
Total	15.639	233			

* $p < 0.05$

The most common types of media used were smartphones ($n = 87, 37.2\%$). The least used media device was the PlayStation ($n = 19, 8.1\%$). Detailed information on the most common types of media used among children is presented in Table 4.

Table 4 Most common types of media used among children

Type of Media	f	%
Tablet/iPad	68	29.1
Smartphone	87	37.2
PlayStation	19	8.1
Television	60	25.6
Total	234	100.0

The average of time spent on media use were reported, the results indicated that, of the 234 children, 20 (8.5%) spent less than 30 minutes per day, 53 spent 30 minutes to 1.5 hours (22.6%), 47 (20.1%) spent between 1.5 to 2 hours, 54 (23.1%) spent two to three hours, and 60 (25.6%) spent more than three hours (Table 5).

Table 5 Average of time spent on media use by children

Media Time	f	%
Less than 30 minutes	20	8.5
30 minutes to 1.5 hours	53	22.6
1.5 to 2 hours	47	20.1
2 to 3 hours	54	23.1
More than 3 hours	60	25.6
Total	234	100.0

Discussion

The purpose of this study was to identify relationships between media use and behavioral disorders among a sample of Saudi Arabian children between the ages of three to 11 years. The results indicated that over a quarter

(25.6%) of the children in the sample spent more than three hours per day using mobile devices, which is far greater than the media limits recommended by the [American Academy of Pediatrics \(2016\)](#), one hour per day for two- to five-year-old and 1.5 hours per day for six- to ten-year-old. These results are concerning, as technology overuse can influence the growth of children and teenagers, as their brains are more sensitive to the effects of technology use and overuse than are adult brains ([Johnson, 2020](#)). Social media and electronic application use can also lead to psychological and physical difficulties (e.g., eyestrain, trouble concentrating on essential tasks, and poor academic achievement), which can lead to more serious health problems ([Mustafaoğlu et al., 2018](#)).

The study results also indicated that the children used various devices, ranging from stationary (television and game consoles) to portable devices (tablets and smartphones). The smartphone was the most frequently used device used, possibly due to its size and accessibility. Furthermore, because smartphones can run educational applications, parents may offer them to their children to keep them occupied and quiet in certain situations. Moreover, our findings aligned with those of other studies indicating that three-quarters of children have their own smartphones, and almost all children use them ([Kabali et al., 2015](#); [Setiadi et al., 2019](#)). Indeed, smartphone use can be positive or negative for children, depending on the type of programs used and how long they are used.

The current study results showed no significant relationship between physical problems without a medical cause and the type of media used or the time spent using it. This finding contrasts with other study findings indicating that long periods spent viewing TV, laptops, iPads, mobile phones, and video games can contribute to fatigue ([Boyd, 2020](#)). Furthermore, the absence of body and eye movement associated with using such devices can cause headaches ([Yle, 2014](#)).

The most important finding of the current study was the significant relationship between children's time spent in media use and behavioral disorders. This finding corroborates prior studies relating behavioral issues to time spent using media (Poulain et al., 2018; Wu et al., 2017).

Implications of the Study

The finding that the time of media uses is significantly associated with children's behavior brings a different perspective to the media use for education, communication, and entertainment. Indeed, parents need such crucial information before deciding how much media their children should be allowed to consume. Nurses and future researchers can utilize results from this study to regulate the use of media among children. Nurses are encouraged to develop educational programs to raise awareness among parents and children regarding the consequences of excessive media use.

One obstacle to reducing children's excessive media use is adult media overuse, which can set a bad example for children. The authors of the current study recommend that parents adhere to the media usage hours recommended by the American Academy of Pediatrics (2016). Furthermore, individuals obliged to use media for long periods should consider the American Academy of Ophthalmology's 20-20-20 rule: for every 20 minutes of media use, shift your eyes and focus on an object at least 20 feet away, for at least 20 seconds (Boyd, 2020).

To expand upon these findings, future nursing research may replicate this study using the complete HBQ to assess children's physical health and school functioning in relation to media use. Furthermore, qualitative research could be conducted using interviews, observations, or focus groups to explore children's behavior secondary to media use. Moreover, larger sample sizes are needed to improve the generalization of results. Further randomized controlled trials are needed to examine the feasibility of interventions that regulate media use among children.

Limitations of the Study

This study has some limitations. While using a cross-sectional design makes it possible to identify associations between media use and behavioral disorder, causality cannot be inferred. Next, these findings may not be generalizable due to the small sample size. Moreover, using an online questionnaire made it difficult for respondents to clarify some questions they may have found difficult to answer. Constructs of the HBQ in this study have not been confirmed by exploratory and confirmatory factor analysis.

Conclusion

This study offers insights into the associations between frequent media use and children's behavior. While the type of media used does not seem to influence children's behavior, the time spent using media correlates with behavior problems. Therefore, it is concluded that the more

time a child spends using mobile devices, the more impact such use will have on their behaviors. Future nursing research is needed to examine the feasibility of programs that regulate media use among children

Declaration of Conflicting Interest

The authors have no conflict of interest to declare.

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Authors' Contributions

SA was responsible for the conceptualization, methodology, validation, and data interpretation. DB, HA, AA, and SA were responsible for literature review, data collection, analysis, and data interpretation. All authors contributed equally in writing, reviewing, and editing this manuscript.

Data Availability Statement

The datasets generated or analyzed during the current study are available from the corresponding author on reasonable request.

Authors Biographies

Salmah Alghamdi, PhD, MSN, RN is an Assistant Professor in the Maternity and Child Health Department, Faculty of Nursing, King Abdulaziz University, Jeddah, Saudi Arabia.

Duaa Bawageeh, Hessa Alkhaibari, Amwaj Almutairi, and Shoug Aljuhani are undergraduate nursing students at the Faculty of Nursing, King Abdulaziz University, Jeddah, Saudi Arabia.

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