



## Graduate Medical Education Research Journal

Volume 2 | Issue 1

Article 5

September 2020

### Screen Media Use in Pediatrics: A QI Project to Promote Behavioral Change


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#### Recommended Citation

Kratochvil, T., Wineinger, M., Saner, D., , Fernandez, C. Screen Media Use in Pediatrics: A QI Project to Promote Behavioral Change. *Graduate Medical Education Research Journal*. 2020 Sep 29; 2(1). <https://digitalcommons.unmc.edu/gmerj/vol2/iss1/5>

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## Abstract

**Background:** Children are growing up in an increasingly digital world. As mobile devices and digital screens become more accessible, greater attention is being paid to screen media use and its effect on pediatric development. The American Academy of Pediatrics (AAP) and the World Health Organization (WHO) have released recommended screen time limits for children of various ages and emphasize the importance of high-quality screen media when used. In 2016, the AAP released the Family Media Plan: an online tool developed for families to create personalized strategies to manage screen media use.

**Objective:** While a useful tool, the AAP's Family Media Plan does not lend itself to use by pediatricians in the clinical setting. The aim of this quality improvement (QI) project is to determine whether screen media use can be reduced in the pediatric population through patient counseling and use of a take-home goal sheet, adapted from the AAP's Family Media Plan.

**Methods:** Thirty-eight children, ages 6 to 13, agreed to participate in this study. Pre-intervention hours of screen media use per week was collected. The Media Use Plan, a summarized, print version of the AAP's Family Media Plan, was developed and distributed to study participants' families to be used in their homes. One month later, families were contacted to complete a post-intervention telephone interview.

**Results:** Of the 38 patients that consented to participating in the study, 35 completed both pre- and post-intervention surveys. The median screen time per week decreased from 16 hours to 12 hours after pediatrician counseling and Media Use Plan intervention.

**Conclusion:** Our data suggests that engaging patients in goal-oriented discussions and use of the Media Use Plan was effective in reducing screen time per week. Future iterations of this study may explore demographic effects and the sustainability of these results beyond the one-month period.

## Keywords

media use, children, pediatric, screen time, behavior, counseling, quality improvement

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## Cover Page Footnote

We thank Kari Nelson and Emma Schultz for their assistance in this project's data analysis. Additionally, we thank Jillyn Kratochvil and Rachel McCann for their mentorship and guidance in carrying out this project. Finally, we thank Children's Hospital & Medical Center and the University of Nebraska Medical Center for their support of this project.

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## Introduction

In an era defined by social media and mobile devices, digital screens have become increasingly omnipresent. In 2018, 95% of teens reported owning or having access to a smartphone, with 45% reporting they use the internet on a computer or cell phone "almost constantly."<sup>1</sup> Screen time has been associated with negative health and social outcomes, including inadequate sleep, increased rates of obesity, and decreased social connectedness.<sup>2,3,4</sup> In response to these trends, a number of studies have sought to identify effective strategies to promote healthy screen media use in children and teens.<sup>5</sup> The American Academy of Pediatrics (AAP) and the World Health Organization (WHO) have produced guidelines for appropriate screen media use (Table 1).<sup>6,7,8</sup>

In 2016, the American Academy of Pediatrics (AAP) published the *Family Media Plan*, an online tool to help families generate a personalized plan to effectively manage screen media use.<sup>9</sup> This individualized tool not only helps identify when and where screen media use is appropriate, but aids in setting goals to promote sleep, exercise, reading, and community activities.

While a comprehensive tool, we found that the web-based format for the AAP's *Family Media Plan* did not effectively lend itself to clinical use. Pediatricians have a limited amount of time to spend with each patient and an effective, efficient tool to support behavioral change is of peak importance.<sup>10</sup> This quality improvement project seeks to determine whether in-clinic patient counseling with the child's pediatrician and use of a take-home goal sheet can reduce screen media use.

With approval from the AAP, we developed a summarized, print version of the *Family Media Plan* as a tool to decrease total screen time and encourage healthy behaviors in the pediatric population, hereby referred to as the *Media Use Plan*. This tool offered a format for families to take independent initiative to evaluate and structure a personalized plan to reduce screen media use in their home. We hypothesized that in-clinic patient counseling and use of our adapted, print *Media Use Plan* would reduce weekly screen media consumption.

## Methods

**Study Design:** Families of children ages 6-13 (elementary and middle school age) were asked to participate in this prospective quality improvement study during annual health maintenance exams. Consenting families were asked to submit the average number of hours each child spent using screen media per week, outside of school-related activities. Screen media included televisions, computers, tablets, phones, and video games. The pediatrician then provided education about healthy habits for limiting screen time and screen media use at large. The pediatrician assisted each family in filling out the *Media Use Plan* and encouraged families to take the *Media Use Plan* home, hang it in a visible area for the following month, and carry out their personalized plan.

Approximately one month after the initial visit, the pediatrician contacted families via phone for the post-intervention interview. Parents were asked 1) the average number of hours their child had spent using screen media per week, and 2) to complete a qualitative

## Table 1.

Recommendations for screen media use in the pediatric population by age.

American Academy of Pediatrics		World Health Organization	
Age (years)	Screen Media Use	Age (years)	Screen Media Use
< 1.5-2	Avoid digital media use (except video chatting)	0-2	0 hours
1.5-2	If screen media is introduced to the child, choose high-quality programming and co-viewing with parent is recommended	2-3	< 1 hour
2-5	<1 hour of high-quality programming, co-viewing with parent recommended	3-4	< 6 hour
All ages	Parents should set consistent limits on hours per day and types of media used		

interview regarding any changes their family had made over the past month.

**Population:** Study participants were recruited from three Children’s Physicians pediatric clinics in Omaha, Nebraska. Children ages 6-13 were eligible to participate. A total of 38 families consented to participate in the study and 35 completed pre- and post-intervention surveys.

**Materials:** The *Media Use Plan*, a take-home tool designed for this study, was developed based on the AAP’s HealthyChildren.org *Family Media Plan*. Permission was obtained from AAP and proper citation was included on all materials used. This one-page tool, printed in English and Spanish, allowed patient families to create a personalized plan according to their daily routine and lifestyle. Categories and examples for proposed lifestyle changes can be found in Table 2. These options allowed participants to either circle interventions they were willing to carry out or create their own. In addition to these

interventions, the final question on the tool asked participants to commit to a maximum amount of screen time per day and a minimum amount of time spent exercising per day or every other day.

**Statistics:** Screen time was reported in hours per week. Median, standard deviation, and interquartile ranges were calculated for number of hours spent using screen media. The Wilcoxon Signed-Rank Test was used to identify change in median screen time before and after intervention. An alpha level was set at  $p < 0.05$ .

## Results

Completed survey data was received from 35 of the 38 study participants. Three of the survey participants demonstrated no change in screen time and were eliminated in accordance with the Wilcoxon Signed-Rank Test guidelines.<sup>11</sup> Median weekly screen time decreased from 16 to 12 hours after *Media Use Plan* intervention ( $p < 0.0001$ , Figure 1).

In post-study interviews, families were given the opportunity to share additional detail about changes made to decrease screen media use. Examples of interventions included installing apps to monitor their child’s screen time, substituting reading for television before bed, and using screen time as an incentive for time spent playing outside or reading. Other families reported that while this study’s intervention did not lead to a change in their child’s total screen time, it did lead to other outcomes. These included productive family conversations about screen media use, a change in screen media content with a shift toward more educational material, and increased awareness of their child’s device usage.

## Discussion

Our data suggest that engaging in a goal-based discussion and use of our adapted, print *Media Use Plan* is effective in reducing screen time in the pediatric population. This supports our study’s hypothesis. Sending patients home with a personalized tool grants families a method for goal-setting and may serve as a nidus for family conversation regarding screen media consumption. This tool also serves as a concrete conversation piece to promote behavioral change in the clinical setting. Future research may explore if a correlation exists between screen media use and BMI, age, or other demographic factors. Additionally, one may explore whether changes are sustained beyond the one-month timeline used in this study.

Limitations of this study include the influence of seasonal patterns, particularly weather’s influence on time spent indoors and whether children were in school or on holiday. Additionally, there may have been variability in how pediatricians counseled families about screen media use and how average screen media use time was calculated per week. Lastly, families were asked to report screen time from memory; therefore, our data may be subject to recall bias. ■

<https://doi.org/10.32873/unmc.dc.gmerj.2.1.001>

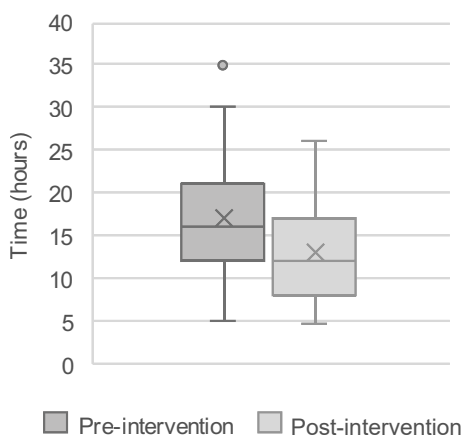
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**Table 2.**

Summary of proposed interventions found in the *Media Use Plan*.

Category	Examples Offered	
“Screen Free Zones”	<ul style="list-style-type: none"> <li>Kitchen table</li> </ul>	<ul style="list-style-type: none"> <li>Bedroom</li> </ul>
“Screen Free Time”	<ul style="list-style-type: none"> <li>1 hr. before bed</li> <li>School</li> </ul>	<ul style="list-style-type: none"> <li>Car rides lasting less than one hour</li> </ul>
Nighttime device charging location	<ul style="list-style-type: none"> <li>Kitchen</li> <li>Parent’s bedroom</li> </ul>	<ul style="list-style-type: none"> <li>In participant’s bedroom if across the room and on silent</li> </ul>
Screen Time Rules	<ul style="list-style-type: none"> <li>No device use if someone is talking to the participant</li> <li>No bullying or inappropriate use of the device</li> </ul>	<ul style="list-style-type: none"> <li>Device privacy settings will be activated</li> </ul>
Device use if the participant...	<ul style="list-style-type: none"> <li>Reads</li> <li>Spends time with family/friends</li> </ul>	<ul style="list-style-type: none"> <li>Exercises for (patient-identified number) minutes</li> <li>Participates in Arts &amp; Crafts</li> </ul>



**Figure 1.** Average screen time per week in children ages 6-13. Screen time was measured at baseline and approximately one month after initial intervention, which included pediatrician-provided education about healthy screen media use and in-home deployment of the personalized *Media Use Plan*. Changes in screen time were determined statistically significant in accordance with The Wilcoxon Signed-Rank Test (N=35,  $p < 0.0001$ )

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