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The Negative Impact of Excessive Screen Time on Language Development in Children Under 6-Years-Old: An Integrative Review with Screen Time Reduction Toolkit and Presentation for Outpatient Pediatric and Family Health Providers

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Abstract

Background. Increased amounts of recreational screen time, defined as time watching television and DVDs, playing videogames, and using computers, tablets, and cellular phones without academic purpose, and the lack of effective media use assessment and patient education being done by primary care providers is associated with increased risk of language developmental delays for young children under 6-years-old.

Purpose. The purpose of this integrative review is to develop a toolkit that provides education for providers and families on the adverse effects of excessive screen time on language development in children younger than 6-years-old and evidence-based screen time reduction strategies that can be implemented in outpatient primary care clinics at all wellness visits.

Toolkit and Presentation. An integrative review was conducted to describe the effects of excessive screen time on language development for children under age 6 and analyze interventions to decrease screen time. From these results, the *Screen Time Reduction Toolkit* was created. The toolkit includes the 2-Question Assessment for Screen Time (2-QAST), screen time reduction algorithm, provider and patient education on health risks associated with excessive screen time, screen time recommendations published by the American Academy of Pediatrics (AAP), and evidence-based screen time reduction strategies, provider resources, and patient education handouts. The integrative review findings and toolkit were presented to a group of local pediatric providers, nurses, and medical technicians for education and implementation.

Outcomes/Discussion. The pre-presentation survey was created after the Health Belief Model (HBM), which served as the framework for this educational intervention. Staff members had high perceived seriousness (83%), perceived susceptibility (83%), and perceived benefit (100%), demonstrating that staff members' attitudes and beliefs about screen time for young children

were in agreement with the principles of this project. Barriers identified included lack of knowledge about health risks from excessive screen time, potential for parental resistance to screen time reduction advice, and time constraints during wellness visits. Regarding *cues to action*, staff members requested visual aids, handouts, and more education about screen time. The toolkit and patient education resources reduce barriers and address *cues to action* identified by the staff members. The post-presentation evaluation revealed that 100% of staff members found the toolkit presentation informative and said it increased their knowledge and understanding of the topic.

Conclusion. The toolkit provides the education that providers need to be knowledgeable as well as confident in their ability to discuss screen time with families. Being consistent about providing a few minutes of screen time education at every wellness visit from 2-months-old to 5-years-old sets a solid foundation for parents and children to create healthier screen time habits at home.

Keywords: Screen time, television, media use, children, language delay

The Negative Impact of Excessive Screen Time on Language Development in Children Under 6-Years-Old: An Integrative Review with Screen Time Reduction Toolkit and Presentation for Outpatient Pediatric and Family Health Providers

Introduction and Background

Language development and vocabulary growth in young children are directly related to the amount of time parents spend speaking to them. Kuhl (2004) reported that in studies examining speech-perception learning and speech-production learning, human-human interactions had a strong influence on a child's language development. She also reported that infants learned best from live sessions versus televised ones, and social feedback was an important predictor for the quantity and quality of infant vocalizations. Therefore, heavy television use or excessive screen time can interfere with a child's language development because parents spend less time interacting with and talking to their child. Furthermore, receptive language delays by age 5 are a significant risk factor for social and emotional problems in adulthood (Schoon, Parsons, Rush, & Law, 2010).

Results from several studies support this association between excessive screen time in children under 6-years-old and language delays (Chonchaiya & Pruksananonda, 2008; Duch et al., 2013; Lin et al., 2015). Lin, Cherng, Chen, Chen, and Yang (2015) conducted a quasi-experimental study and determined that exposure to television was correlated with an increased risk for language developmental delays in young children ages 15- to 35-months-old. The exposure group consisted of 75 children who watched an average of 137.2 min/day. The 75 children in the control group watched an average of 16.3 min/day. The exposure group's risk of delayed language development was 3.3 times higher than that of the control group. Duch et al. (2013) found that Hispanic infants and toddlers who watched excessive television, defined as

2 hr/day or more, had 5.5 times the risk of having lower scores on the Communication section of the Ages and Stages Questionnaire (ASQ-3) after 1 year compared to those children who watched less than 2 hr/day. Chonchaiya and Pruksananonda (2008) also conducted a study with a sample of 56 children with language delays and 110 children with normal language development, ages 15- to 48-months-old. They asserted that children who started watching television before 12 months of age and watched more than 2 hr/day were six times more likely to develop a language delay. Although studies on the relationship between screen time and language development are few and mostly limited to observational or quasi-experimental methods, findings have remained consistent that increased screen time is associated with an increased risk for language developmental delays.

Researchers have also investigated how screen time interferes with language development by examining the interactions between young children and their caregivers (Chonchaiya & Pruksananonda, 2008; Christakis et al., 2009; Tanimura, Okuma, & Kyoshima, 2007). Christakis et al. (2009) explored verbal exchanges between a parent and child while watching television. They conducted an observational study to determine the relationship between the amount of time watching television and the number of parent-child interactions in a group of 326 children ages 2 to 36 months. For every 1 hr of television watched, the children were exposed to 500 to 1000 fewer words. The authors also ascertained that significant reductions for child vocalizations, vocalization duration, and conversational turns were associated with more time spent watching television. These decreased experiences for parent-child interactive language learning may impact normal language development. Chonchaiya and Pruksananonda (2008) established an association between the amounts of time caregivers interacted and conversed with their children in a day and risk for developing language delays.

The children with language delays spent an average of 7 hr/day with their caregivers in which 3.6 of those hours, on average, were spent in conversation. The children in the control group with normal language development spent an average of 9.3 hr/day with their caregivers in which 5.8 of those hours, on average, were spent in conversation. Furthermore, Chonchaiya and Pruksananonda (2008) determined that children who watched television alone were 8.5 times more likely to develop a language delay. Similarly, Tanimura, Okuma, and Kyoshima (2007) observed that when the television is on, parents converse and interact less with their children. In an observational study performed in Japan, parents frequently spoke in shorter, one-word sentences and spoke less words overall to their children when the television was on. Taken together, results from these studies support the premise that television viewing disrupts caregiver-child verbal interactions, which results in less words being spoken to the child and less opportunities for modeling two-way conversation and conveying thoughts in sentences rather than single words.

The American Academy of Pediatrics (AAP) advisory board recognizes the health implications of too much screen time. In addition to language delays, children are at increased risk for obesity, violence and aggression, loss of social skills, attention problems, anxiety and depression, sleep deprivation, vision problems, migraine headaches, repetitive motion syndrome and arthritis (American Academy of Pediatrics [AAP], 2016). In January 2017, the AAP advisory board ratified an online Media and Children Communication Toolkit, which encourages families to create a media use plan to gain awareness of media use habits and adopt methods to decrease use. In their most recent 2016 policy statement, the AAP advisory board advocated for no screen time in children under the age of 18-24 months other than video-chatting and to limit screen time to less than 1 hr/day of high-quality programming and apps for children ages 2-5

because of the harmful impact it might have on the developing brain. They also recommended caregivers co-view and co-use media, not allow screen time during meals or for 1 hour before bedtime, and remove televisions and other media devices from children's bedrooms. Still, according to parent surveys, 90% of children younger than 2-years-old are exposed to 1 to 2 hr/day of television with 14% of them watching greater than 2 hr/day of television (AAP, 2011). Thirty-eight percent of infants use mobile devices like smartphones (Rideout, 2013). The typical American child before age 5 watches 4.5 hr/day of television (Christakis, 2011).

Many caregivers believe that screen media can have a positive impact on their child's cognitive development because many programs and products advertise this as a benefit (AAP, 2011; Beck et al., 2015; Vandewater et al., 2005). Caregivers who believe a television program or video is educational and important to healthy development are twice as likely to have the television on for extended periods of time (Vandewater et al., 2005). An interview with a group of Hispanic families found limited knowledge among caregivers about the potential risks of too much screen time, but the caregivers also reported they would reduce their children's screen time if they were better educated about this issue (Beck et al., 2015). Improved education and awareness about the potential for language delays in young children due to excessive screen time can empower families to reduce screen time in their homes.

The primary care setting offers excellent opportunities to promote screen reduction education to young children and their families. From birth to age 5, children will see their provider a minimum of 12 times for routine wellness visits. Despite this opportunity only 16% of pediatricians in the United States ask patients and their families about their media use, and this statistic has not changed in the last 20 years despite the production of new devices providing

more opportunities for screen time, including tablets, portable DVD players, and smartphones (Shifrin et al., 2015).

Problem Statement

Increased amounts of recreational screen time, defined as time watching television and DVDs, playing videogames, and using computers, tablets, and cellular phones without academic purpose, and the lack of effective media use assessment and patient education being done by primary care providers is associated with increased risk of language developmental delays for young children under 6-years-old. This is a significant issue because language development is biologically correlated to age, and these early years are crucial for language acquisition, especially phonetics and syntax.

Integrative Review of the Literature

Methods

Search strategy. A three-step search strategy was utilized in this review to find published studies. An initial limited search of Medical Literature Anayslis and Retrieval System Online (MEDLINE) and Cumulative Index to Nursing and Allied Health Literature (CINAHL) was undertaken followed by an analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. A second search using all identified keywords and index terms was then undertaken across CINAHL, PubMed/MEDLINE, and PubMed Central. The following keywords and combinations were searched in CINAHL: young children, television, television viewing, television viewing reduction, decreasing television viewing, media use, media use reduction, decreasing media use, screen time, screen time reduction, decreasing screen time, language, language development, and language delays. The following Medical Subject Headings (MeSH) and combinations were searched in PubMed/MEDLINE and PubMed

Central: television, language development disorders, child—preschool, and infant. Thirdly, the reference list of all identified reports and articles were searched for additional studies. Studies published in English between 2004 and 2016 were considered for inclusion in this review.

Inclusion and exclusion criteria. The following inclusion criteria were applied: (1) studies involving children under age 6 from any country, (2) studies that evaluated the effect of screen time, television viewing, or media use on language development, (3) studies that implemented interventions in the primary care setting to reduce screen time, television viewing, or media use. This review included studies with the following outcomes: decreased risk of language developmental delays and decreased screen time, television viewing, or media use. This review examined both experimental and epidemiological study designs during the search process including randomized controlled trials (RCTs), non-RCTs, quasi-experimental studies, before and after studies, prospective and retrospective cohort studies, case control studies and analytical cross sectional studies for inclusion. Descriptive epidemiological study designs including case series, individual case reports and descriptive cross sectional studies were also reviewed and considered for inclusion.

Assessment of methodological quality. Papers selected for retrieval were evaluated using the Evidence Appraisal Tools from the John Hopkins Nursing Evidence-Based Practice Model (Dearholt & Dang, 2012).

Results

Study characteristics. A search of CINAHL, MEDLINE, PubMed and PubMed Central resulted in 771 studies. From these results, 120 articles were extracted with 55 of them being duplicates. The titles and abstracts of the remaining 65 studies were reviewed using the inclusion criteria and excluded if the criteria was not met. Fifty-five studies were excluded due to

children's ages being greater than 5-years-old, non-primary care based setting used and intervention not practical for primary care. At the conclusion of the search, 10 studies met the criteria and were included in this review. Two of the studies were Level IA systematic reviews/meta-analyses (Downing, et al., 2016; Wahi et al., 2011). Five of the studies involved primary care or clinic-based interventions consisting of four Level IA RCTs (Birken et al., 2012; Campbell et al., 2013; Taveras et al., 2011b; Yilmaz et al., 2014) and one Level IIC pilot non-RCT (Taveras et al., 2011a). The remaining studies included one school-based Level I RCT (Dennison et al., 2004) and two family-centered, community-based pilot RCTs (Hinkley et al., 2015; Zimmerman et al., 2012) involving interventions that could be practically translated to the primary-care setting. All of these studies examined screen time, television viewing, or media use reduction interventions. However, no experimental studies were found that discussed an associated risk reduction in language development with screen time reduction; rather, most of these studies examined obesity-related associations such as Body Mass Index (BMI), sedentary activities, and unhealthy foods.

Intervention components and results. Wahi et al. (2011) performed one of the first systematic reviews and meta-analyses to determine how effective interventions were at decreasing screen time in children of all ages. However, none of the included 13 studies were performed in the primary care setting. Still, those that involved children ages 2 to 6 were the only studies to show a significant reduction in screen time for the intervention group. They concluded that multiple sessions over a prolonged period of time that focus on key age groups might create a sustainable behavioral change.

Along those lines, Campbell et al. (2013) postulated that parents may be more receptive and have a greater desire to learn about improving their child's health when their children are

quite young, which might explain screen time reduction success in children younger than 6-years-old. They conducted a successful quarterly clinic-based intervention to first time parent groups with children ages 4- to 18-months-old. Classes were dietician-delivered 2-hour sessions on infant feeding, diet, physical activity, and television viewing using DVDs, in-class written materials, and take-home newsletters. The 271 children in the intervention group from a sample of 542 children decreased their television viewing time by 25% compared to the control group.

Dennison, Russo, Burdick, and Jenkins (2004) were the first to implement a school-based intervention to decrease screen time in preschoolers. Ninety children ages 2.6 to 5.5 years old participated in the intervention group and decreased their television viewing by 3.1 hr/week. The percentage of children who watched television for more than 2 hr/week also decreased from 33% to 18%. Through seven 20-min weekly sessions, they urged children to read books daily and encouraged parents to remove televisions and Internet-ready devices from children's bedrooms and to have family meal times without television. Children brainstormed lists of alternative activities and were encouraged to act as advocates for reducing screen time. Various educational materials were sent home describing strategies to limit media use. Finally, children were challenged to be television-free for 7 to 10 days. This study was included in this review because the interventions could be translated to the primary care setting.

To illustrate this, Yilmaz, Caylan, and Karacan (2014) intervened at health maintenance visits in the primary care setting and incorporated these same interventions in the forms of printed materials and CDs, counseling calls, picture books depicting screen-free homes, and handouts with success stories. This screen time education was provided to patients and their families every 2 weeks for 8 weeks. They sampled 363 children, ages 2- to 6-years-old, and their

families. The 187 children in the intervention group had an overall decrease in television viewing from 86 min/day to 21 min/day after 9 months.

Taveras et al. (2011b) were also successful in decreasing screen time by intervening in the primary care setting. Like Yilmaz et al. (2014), the intervention was conducted over several sessions: four 25-min in-person sessions and two 15-min phone calls completed over 1 year. Motivational interviewing was the primary technique used in addition to printed educational information. Parents were encouraged to choose two out of six possible intervention activities with screen time reduction being one of them. They sampled 475 children ages 2- to 6-years-old and decreased total television viewing time by an average of 36 min/day among the 271 children in the intervention group. However, some of the children decreased their screen time by as much as 58 min/day if their parents specifically chose that intervention activity.

Taveras et al. (2011a) also conducted a primary care based pilot RCT targeting mother-infant pairs during each well child visit from birth to age 6 months. This study successfully used clinician-directed motivational interviewing, specifically family-centered collaborative negotiation, to discuss television viewing time. They also provided parents with comprehensive educational materials. Because this was a pilot study, the sample size was small, but the results are promising. They sampled 84 infants up to 6-months-old, and television viewing decreased from 1.5 hr/day to 1.2 hr/day for the 60 infants in the intervention group.

One primary care based RCT (Birken et al., 2012) did not show any change in screen time post-intervention. Unlike the other three primary care based studies included in this review, Birken et al. (2012) used a one-time intervention. They provided a single 10-min educational discussion about screen time reduction at the 3-year well child visit to an intervention group of 81 children. No significant change in screen time habits was sustained when they followed up 1

year later. Birken et al. (2012) concluded that short interventions might not be useful for preschool-aged children and that repeated reinforcement may be needed.

Downing, Hnatiuk, Hinkley, Salmon, and Hesketh (2016) performed the most recently published systematic review and meta-analysis of RCTs using interventions to improve sedentary behaviors among 0-5-year-olds. Television viewing time was listed as one of these sedentary behaviors. They concluded that screen time reduction interventions proved more successful when they were long-term, occurring for more than 6 months, and required strong parental involvement. Because there were few primary care based studies, they could not draw definitive conclusions about the success of interventions conducted in that setting. However, they did highlight the positive effect of motivational interviewing on changing behaviors.

The following two studies (Hinkley et al., 2015; Zimmerman et al., 2012), although community-based, were included in this review because improving education about screen time was the primary intervention. Education can easily be incorporated into the primary care setting and is the foundation for the interventions in all of the studies previously discussed.

The small sample size of only 22 2-3-year-old children was the major drawback for the community-based, family-centered pilot RCT conducted by Hinkley et al. (2015). Their primary intervention was using educational sessions to reduce daily amount of electronic media use, which included increasing knowledge about current recommendations, potential adverse outcomes of use, and strategies to reduce electronic media use. These 1-hr long educational sessions were held weekly for 6 weeks. They were able to decrease daily electronic media use by 33% or 39 min/day.

Likewise, Zimmerman et al. (2012) conducted a community-based pilot RCT for children ages 2.5 to 4.5-years-old. Again, the major drawback of the study was its small sample size: 67

participants with 34 in the intervention group. Over the course of 4 months, children in the intervention group and their parents received written educational materials encouraging parents to reduce their child's media viewing to less than 1 hr/day. The intervention group reduced their total television viewing time by 39 min/day or 30% compared to the control group. Zimmerman et al. (2012) concluded that clearly communicating to parents about the potential health risks of excessive media use and providing them screen time reduction strategies and alternative activities can make screen time reduction possible.

In summary, all of these research teams used common screen time reduction topics as part of their educational sessions: screen time recommendations based on age, health risks of excessive screen time, setting rules for use such as no screens during family meal times or 1-hr before bedtime, co-viewing and co-using media, displacing screen time with other activities such as reading, removing televisions and other media devices from children's bedrooms, and advocating for educational media and a screen-free week.

Discussion

The *technologizing* of childhood is an emerging topic of interest (Christakis, 2015). Therefore, few studies exist for screen time reduction interventions in the primary care setting specific for children younger than 6-years-old, but the results from the studies examined in this integrative review are promising. This integrative review included two systematic reviews/meta-analyses (Downing et al., 2016; Wahi et al., 2011), five RCTs (Birken et al., 2012; Campbell et al., 2013; Dennison et al., 2004; Taveras et al., 2011b; Yilmaz et al., 2014), two pilot RCTs (Hinkley et al., 2015; Zimmerman et al., 2012), and one pilot non-RCT (Taveras et al., 2011a). Table 1 lists the seven primary experimental studies included in this review (Campbell et al., 2013; Dennison et al., 2004; Hinkley et al., 2015; Taveras et al., 2011a; Taveras et al., 2011b;

Yilmaz et al., 2014; Zimmerman et al., 2012) and outlines the study type, setting, intervention time, and resulting screen time reduction. The RCT results by Birken et al. (2012) were determined to be an outlier and were not included in the table or any of the calculations discussed below; they implemented a single 10-min intervention which resulted in no significant reduction in screen time when surveyed 1 year later. The table also does not list the two systematic reviews/meta-analyses (Downing, et al., 2016; Wahi et al., 2011).

Table 1

Screen Time Reduction Based on Study Type, Setting, and Intervention Time

Author/Year	**Study Type**	**Setting**	**Intervention Time (wks)**	**Screen Time Reduction (min/day)**
Hinkley (2015)	Pilot RCT	Community	5	39
Yilmaz (2014)	RCT	Primary Care	8	65
Campbell (2013)	RCT	Primary Care	65	15
Zimmerman (2012)	Pilot RCT	Community	17	39
Taveras (2011a)	Pilot non-RCT	Primary Care	26	20
Taveras (2011b)	RCT	Primary Care	52	36 (58)
Dennison (2004)	RCT	School	6	27

In their recent systematic review/meta-analysis specifically looking at screen time reduction for children under 6-years-old in all types of setting, Downing et al. (2016) concluded that screen time reduction interventions lasting longer than 6 months were more effective. The average length of intervention of the seven successful experimental studies included in this integrative review was 32 weeks or 7.4 months (Campbell et al., 2013; Dennison et al., 2004; Hinkley et al., 2015; Taveras et al., 2011a; Taveras et al., 2011b; Yilmaz et al., 2014; Zimmerman et al., 2012). Three of the studies lasted between 5 and 8 weeks (Dennison et al., 2004; Hinkley et al., 2015; Yilmaz et al., 2014). The other four studies lasted from 17 to 65 weeks (Campbell et al., 2013; Taveras et al., 2011a; Taveras et al., 2011b; Zimmerman et al., 2012). Two of the studies, one lasting 27 weeks (Taveras et al., 2011a) and the other lasting 65

weeks (Campbell et al., 2013), had interventions that were successfully done at every well child visit.

Downing et al. (2016) also found an average screen time reduction of 17 min/day in their systematic review/meta-analysis. The average reduction in screen time from the seven successful experimental studies in this review (Campbell et al., 2013; Dennison et al., 2004; Hinkley et al., 2015; Taveras et al., 2011a; Taveras et al., 2011b; Yilmaz et al., 2014; Zimmerman et al., 2012) ranged from 15 to 65 min/day with a mean of 34 min/day. Taveras et al. (2011b) found that when motivational interviewing was used and caregivers chose to work on screen time reduction specifically, then daily screen time was reduced by 58 min/day compared to only 36 min/day if not specifically chosen. This improves average screen time reduction to 38 min/day across all seven studies, which were either conducted in a primary care setting or used an intervention that could be easily applied to the primary care setting. This is double the average calculated in the systematic review/meta-analyses by Downing et al. (2016) for all settings with the same age group.

The results of this integrative review support a primary care based approach to screen time reduction in children under 6-years-old with education at the foundation of the intervention. Providing screen time reduction education at every wellness visit up to age 5 is a solid strategy. The intervention would last nearly 5 years over the course of 12 visits to the primary care provider. This would be desirable because interventions of longer duration have been shown to be more effective (Downing et al., 2016). Also, two of the studies reviewed were successful when the intervention was conducted at the well child visits (Campbell et al., 2013; Taveras et al., 2011a). All of the studies reviewed used similar screen time reduction topics as part of their educational sessions that also follow the newest AAP (2016) recommendations. Incorporating

these same topics into a screen time reduction toolkit for primary care use would be beneficial. Finally, motivational interviewing, specifically family-centered collaborative negotiation, was successfully utilized in two of the studies and touted by Downing et al. (2016), so this would be an useful skill to employ when discussing screen time reduction strategies with patients and their caregivers.

Evidence Based Practice: Verification of Chosen Option

The purpose of this integrative review was to develop a toolkit that provides education for providers and families on the adverse effects of excessive screen time on language development in children younger than 6-years-old and evidence-based screen time reduction strategies that can be implemented in outpatient primary care clinics at all wellness visits.

Theoretical Framework

The Health Belief Model (HBM) was selected to guide this project and explain why a large percentage of young children spend an average of 2 hr/day or more in front of screens despite screen time recommendations from the AAP advisory council (2016) stating no screen time for children less than ages 18-24 months and to limit screen time to 1 hr/day for children up to ages 2-5-years-old. The HBM was first developed for use in the public health sector to determine how personal beliefs or perceptions influence health behavior (Hochbaum, 1958). The model was expanded in the 1980s to include *cues to action* and *self-efficacy* to better understand what healthcare providers can do to change perceptions, provide opportunities for subsequent change in health behavior, and improve compliance with health-related recommendations (Becker & Rosenstock, 1984; Janz & Becker, 1984; Rosenstock, Strecher, & Becker, 1988). The HBM consists of four main perceptions: perceived susceptibility of the health problem, perceived severity, perceived benefits, and perceived barriers. These four perceptions describe an

individual's readiness for action. The expanded model includes *cues to action* that would activate the individual's readiness for action. It also includes modifying factors such as demographic, sociopsychologic, and structural variables that may influence perception. A final concept called *self-efficacy* describes the individual's confidence in his or her own ability to perform the action. A diagram of the chosen HBM format for this project can be located in Appendix A.

Several important questions regarding young children, screen time, and risk for language developmental delays can be addressed within the HBM framework to help explain why children's screen time remains elevated and also to guide intervention (adapted from Das & Evans, 2014):

Table 2

Assessment of Screen Time Perceptions Based on the Health Belief Model

Perceived Susceptibility	Does the patient's caregiver and/or healthcare provider believe that excessive screen time by infants and toddlers may be associated with language developmental delays?
Perceived Seriousness	Does the patient's caregiver and/or healthcare provider believe that the potential consequence of a language developmental delay for their infant or toddler from too much screen time is significant enough to try to avoid?
Perceived Benefit	Does the patient's caregiver and/or healthcare provider believe there are benefits to decreasing screen time for infants and toddlers related to language development?
Perceived Barriers	What barriers do the patient's caregiver and/or healthcare provider face that prevent them from trying to decrease the amount of screen time? What can be done to decrease these barriers?
Cues to Action	What techniques, strategies or tools can motivate the patient's caregiver and/or healthcare provider to decrease screen time?
Self-Efficacy	How confident does the patient's caregiver and/or healthcare provider feel in his or her ability to decrease screen time? What can be done to increase their confidence?

Overall, caregivers' perceived susceptibility and perceived seriousness is low for adverse outcomes such as language developmental delays related to young children and screen time. Many caregivers, on the other hand, have a high perceived benefit regarding screen time, and their perceptions are directly related to lack of knowledge. Garrison and Christakis (2005)

performed a systematic review and found no studies showing improved cognitive development for children under 6-years-old for any educational videos, videogames, or computer programs currently being marketed. Garrison and Christakis (2005) also identified that in regards to television programming, there have been some studies demonstrating cognitive improvements specific to children over 2-years-old for limited, educational programming. No television programs have been shown to benefit cognitive development for infants and toddlers under 2-years-old (Zimmerman, Christakis, & Meltzoff, 2007).

For pediatricians, Strasburger (2007) stated that medical residency programs do not teach about the impact of excessive screen time on children's cognitive development, and few continuing medical education courses cover this topic. This lack of knowledge may also influence providers' perceived susceptibility and perceived seriousness of language developmental delays for young children whose screen time exceeds 2 hr/day. Perceived barriers may include provider-related time constraints. For those providers knowledgeable about the potential risks of excessive screen time, they may lack the time to properly educate patients and their families about this. There is also no standardized media use assessment tool available for clinic use.

Goals, Objectives and Expected Outcomes

The primary goal of the DNP project was to create a toolkit for use in primary care with evidence-based strategies to reduce screen time for children younger than 6-years-old. In order to achieve this, three goals should be accomplished: conduct an integrative review of the literature, create a toolkit with comprehensive resources, and present the toolkit to a group of primary care providers. Table 3 outlines the objectives and expected outcomes for each of these goals.

Table 3

DNP Project Goals, Objectives, and Expected Outcomes

Goals	Objectives	Expected Outcomes
1. Complete an integrative review of the literature.	1. Perform a comprehensive search of the literature through multiple databases using key terms. 2. Select high quality studies that meet inclusion criteria. 3. Review and analyze selected articles for evidence of successful screen time reduction strategies that can be utilized in the primary care setting for children younger than 6-years-old.	Complete an integrative review of the literature that finds successful screen time reduction strategies that can be implemented in the primary care setting for children younger than 6-years-old.
2. Create an evidence-based, comprehensive screen time reduction toolkit for primary care providers.	1. Create a toolkit using findings from the integrative review. 2. Include provider-directed education on the increased risk for language developmental delays with excessive screen time for children under 6-years-old. 3. Create a standardized screen time assessment tool that is quick to perform. 4. Create an easy-to-follow algorithm to illustrate use of the toolkit. 5. Create appropriate educational materials for patients and families on adverse effects of excessive screen time and screen time reduction strategies. 6. Include a bulleted summary of recommendations in a brochure to assist clinicians in providing brief but thorough patient education.	Screen time reduction toolkit created and meets all objectives.
3. Deliver a high quality, professional presentation to educate providers on use of the screen time reduction toolkit.	1. The presentation will be limited to 1-hour to ensure maximal participation. This time frame includes completion of the pre-presentation survey, formal presentation, Q & A session, and post-presentation evaluation. 2. Educate providers on increased risk for language developmental delays due to excessive screen time in young children and current screen time recommendations. 3. Demonstrate use of the toolkit including algorithm, standardized assessment tool, and patient education materials. 4. Use pre-presentation surveys to assess knowledge, attitudes, and beliefs about screen time based on the tenets of the Health Belief Model. 5. Use post-presentation evaluations to assess value of presentation and toolkit and knowledge gained.	1. Increase provider's knowledge about health risks of excessive screen time and screen time recommendations. 2. Providers find the toolkit educational and practical to use. 3. Providers are confident in their ability to use the toolkit and provide screen time reduction education to patients and their caregivers.

Project Design and Methods

This project was developed using an integrative literature review process with an evaluation design. Results from the integrative review were formulated into a toolkit (see

Appendix B). A presentation of the tenets of the integrative review with discussion of the toolkit was developed (see Appendix B). The DNP student used both qualitative (informal dialogue) and quantitative (pre-presentation survey [see Appendix C] and post-presentation evaluation [see Appendix D]) methods for data collection and analysis.

Population, Settings and Resources

The presentation was given to staff members of the Pediatrics Clinic at Seymour Johnson Air Force Base in Goldsboro, NC. Participants included two active duty military pediatricians, one active duty military registered nurse, one civilian contractor registered nurse, and two active duty military medical technicians. The Seymour Johnson Air Force Base Clinic is also known as the 4th Medical Group (MDG) of the national Air Force Medical Service (AFMS) and offers outpatient healthcare services to active duty military members, retirees, and their families. Primary care services include Pediatrics, Family Health, Women's Health, Flight Medicine, and Mental Health. Ancillary services include Pharmacy, Laboratory, Radiology, Public Health, and Physical Therapy. The Pediatrics Clinic has an empanelment of 1,250 patients.

Air Force (AF) medical centers are organized in a functionally similar way as their civilian counterparts. Services are known as flights and are managed by a flight commander. Flights are grouped together as squadrons and likewise managed by a squadron commander. All of the squadrons together are called a group, hence 4th MDG, and is led by the group commander, similar to a Chief Executive Officer (CEO) at a healthcare organization. Other key executive leadership positions include the SGH (Chief of the Medical Staff), SGN (Chief Nurse), and SGA (Administrator, Chief Operating Officer [COO], or Chief Financial Officer [CFO]). New policies and procedures can be suggested and implemented at any level from flight to squadron to group-wide with leadership approval. Additionally, the AFMS may mandate change

across all AF hospitals and outpatient medical centers, and all would be required to comply. In addition to providing healthcare services for its beneficiaries, the 4th MDG prioritizes a unique wartime medical readiness mission.

Facilitators and Barriers

A summary of the requirements for the DNP project and topic were presented to the Pediatrics Clinic leadership in January 2017. The relevance and applicability of this project was emphasized to the Nurse Manager and SGH to ensure support. Besides advocating for the educational value of the toolkit and presentation, the DNP student also suggested that implementation of the toolkit could be easily adapted into a Failure Modes and Effects Analysis (FMEA) project facilitated by Patient Safety or a small-scale quality improvement project to meet their Joint Commission (TJC) accreditation requirements. Both the educational value of the toolkit and the potential for implementing a quality improvement initiative helped to facilitate verbal approval for the toolkit presentation. Following the approval, the DNP student engaged in informal dialogue with Pediatrics Clinic staff members about screen time recommendations and whether this topic was discussed during wellness visits. The DNP student determined that screen time education was not being discussed, and the primary reason was lack of education about screen time recommendations and lack of time.

The most significant barrier encountered was deciding on a date for the presentation that did not conflict with the patient schedule and other required military-related duties, trainings, and exercises and allowed for a diverse group of staff members to attend. In the end, there were six participants from the Pediatrics Clinic – two pediatricians, two registered nurses, and two medical technicians. Staff members who were not able to attend the presentation due to scheduling conflicts included the SGH, one nurse practitioner, and four medical technicians.

Toolkit and Presentation Implementation Plan Summary

Toolkit

Pre-toolkit preparation. An integrative review was conducted on strategies to reduce screen time for children younger than 6-years-old that can be utilized in the primary care setting. Ten studies were included in the review, two systematic reviews/meta-analyses, five RCTs, two pilot RCTs, and one pilot non-RCT, ranging in quality of evidence from Level IA to Level IIC. The results of the integrative review support a primary care based approach to screen time reduction with patient education as the primary intervention conducted at every wellness visit. Patient education discussion topics include: screen time recommendations based on age, health risks of excessive screen time, setting rules for use such as no screens during family meal times or 1-hr before bedtime, co-viewing and co-using media, displacing screen time with other activities such as reading, removing televisions and other media devices from children's bedrooms, and advocating for educational media and a screen-free week. Provider-directed motivational interviewing, specifically family-centered collaborative negotiation, can be employed in these educational discussions with patients and their caregivers to facilitate behavioral change. These findings were used to create a toolkit for use in the primary case setting that focused on screen time reduction in order to prevent language delays among children under 6-years-old (see Appendix B). The DNP student also gathered information on motivational interviewing training resources, local child development community resources, and useful websites to include in the toolkit.

Toolkit development. The *Screen Time Reduction Toolkit* is a comprehensive guide that primary care providers can use to advocate for screen time reduction for children younger than 6-years-old (see Appendix B). Three main interventions are covered: (1) provider-directed

education on the increased risk for language developmental delays associated with excessive screen time in children under age 6, (2) implementation of a screen time assessment at every wellness visit, and (3) patient and caregiver education. The electronic toolkit is modeled like an Internet web page and includes a table of contents at the beginning of the document with hyperlinks to navigate all sections of the toolkit. A comprehensive but easy-to-follow screen time reduction algorithm is included to illustrate how to effectively utilize the toolkit in practice. Like the table of contents, the algorithm contains hyperlinks to various sections within the toolkit. Most pages of the toolkit also have hyperlinks that can be used to return to the table of contents or to the algorithm. The association between excessive screen time and language developmental delays is described, and a summary of the findings from the integrative review of the literature is provided. The importance of doing a screen time assessment on young children is also discussed, especially since only 16% of pediatricians in the U. S. do this (Shifrin et al., 2015). The 2-Question Assessment for Screen Time (2-QAST), recommended by the AAP advisory council (2013), is presented as a time-efficient assessment to be performed at every wellness visit and asks the following two media-related questions:

1. How much screen time does your child consume daily?
2. Is there a TV or mobile media device (tablet/iPad, cell phone, computer) in your child's bedroom?

Topics for discussion are showcased in various patient education formats: brochure, poster, and family media use plan. These items can be printed and displayed or given to patients. The brochure and poster each contain a bulleted summary of important screen time reduction education topics to prompt providers and facilitate a brief discussion. The toolkit also contains lists of helpful websites that can be given to families as well as local child development

community resources for provider referrals. Motivational interviewing resources and the 2016 AAP policy statement and technical report are also embedded references.

Presentation

After developing the *Screen Time Reduction Toolkit*, an educational PowerPoint (PPT) presentation was created (see Appendix B). The presentation discussed the risk for language developmental delays with excessive screen time in children younger than 6-years-old and described the current screen time recommendations for young children. The presentation included a summary of the integrative review findings on screen time reduction strategies in the primary care setting and use of the algorithm and 2-QAST tool. A hyperlink to the actual electronic toolkit was also included so that the DNP student could display and navigate the document during the presentation.

A 1-hr presentation was given to all available Pediatric Clinic staff members on March 6, 2017. Lunch was provided to encourage participation. The presentation included a pre-presentation survey and a post-presentation evaluation and allowed time for a question and answer session at the end. Copies of the brochure and poster were given to attendees. After the presentation was completed, the DNP student provided the clinic with an electronic copy of the *Screen Time Reduction Toolkit*.

Evaluation

Pre-presentation survey. The pre-presentation survey consisted of 10 questions with a mix of numerical responses, Likert scale questions, and short answer responses. Four of the questions were aligned with the six attributes of the HBM and were intended to measure staff members' readiness for action in implementing a screen time reduction intervention by assessing perceived susceptibility (Q5), perceived seriousness (Q6), perceived benefit (Q7), and perceived

barriers (Q9). Self-efficacy (Q8) and cues to action (Q10) were included to determine self-confidence with a potential screen time intervention and what would motivate them to carry out the intervention. Research compiled by the AAP advisory council (2013) showed that providers who watch more television were less likely to recommend that their patients and families decrease their television viewing. Therefore, four questions were included for staff members to assess their personal daily screen time habits, personal perceptions of screen time habits of young children, and knowledge about current screen time recommendations. The pre-presentation surveys were administered and completed before the presentation was started.

Post-presentation evaluation. The post-presentation evaluation consisted of 10 questions asking staff members to evaluate whether the presenter: (1) clearly communicated their purpose, (2) was organized, (3) had a good understanding of the topic, (4) was well-prepared, (5) spoke clearly, (6) used time effectively, (7) had an informative presentation, (8) responded effectively to questions, (9) was engaging, and (10) enhanced understanding and knowledge about screen time recommendations and potential developmental risks. Possible responses were "yes", "needs work", and "no" with the option to add additional comments if desired. There were two additional short answer feedback questions asking them what they liked most about the presentation and areas for improvement. The post-presentation evaluations were administered and completed immediately following the presentation and question and answer session.

Data Analysis

Descriptive statistics were used to analyze the data. The responses from the surveys were entered into table format in Excel. Calculations were made as applicable such as sums and averages. Short answer responses were organized and grouped by common themes.

Results

Pre-presentation survey. Six pre-presentation surveys were completed by two pediatricians, two pediatric registered nurses, and two medical technicians. A majority of the staff members (83%) had high perceived susceptibility, perceived seriousness and perceived benefit regarding excessive screen time and language delays representing a high readiness for action among them. Regarding perceived susceptibility, 83% of staff members agreed or strongly agreed that excessive screen time by children younger than 6-years-old may be associated with language developmental delays; one participant (17%) disagreed. Regarding perceived seriousness, 83% of staff members agreed or strongly agreed that it was important to try to avoid too much screen time for children younger than 6-years-old because of the potential consequences of a language developmental delay; one participant (17%) neither agreed nor disagreed. Regarding perceived benefit, 100% of staff members agreed or strongly agreed that decreasing screen time for children younger than 6-years-old is beneficial for language development. Staff members also responded with the following perceived barriers: (1) time constraints during wellness visits, (2) not having enough personal knowledge about the developmental risks associated with too much screen time, and (3) parental resistance to screen time reduction advice.

In order to activate this readiness for action, *self-efficacy* and *cues to action* were assessed. Regarding *self-efficacy*, 83% of staff members agreed or strongly agreed that they were confident in their ability to discuss screen time with families; one staff member disagreed (17%). Regarding *cues to action*, staff members were asked what techniques, strategies, or tools would motivate them to discuss screen time with families. They responded with the following: (1) visual aids, handouts, and short videos that can be quickly utilized to educate patients and

their families during wellness visits, (2) offering age-appropriate books in the clinic such as *Reach Out and Read*, (3) better education for staff members about the developmental risks associated with too much screen time, and (4) increasing time for wellness visit to 30 min to allow for more education and discussion. Because the majority of the staff members (83%) already have a high level of confidence with this subject, proper education and tools would make a screen time reduction intervention possible to implement.

In response to the self-assessment questions, the staff members had a screen time average of 3.4 hr/day during the weekdays and 4.6 hr/day on the weekends. This screen time is outside of regular work hours. Only 33% of staff members agreed with the statement, "I should reduce my screen time". Another 33% of staff members disagreed with that statement, and an additional 33% of staff members neither agreed nor disagreed. Regarding their perception of how much screen time children younger than 6-years-old actually engage in, the average response from 67% of staff members was 3.3 hr/day during the weekdays and 4.8 hr/day on the weekends. Thirty-three percent of staff members did not respond; they believed the question did not apply to them because they did not have young children living in their homes. Regarding actual screen time recommendations for children younger than 6-years-old, the responses ranged from 0-2 hr/day with an average response of 0.7 hr/day for children under age 2 and 1.5 hr/day for children ages 2-5. All of these responses support the need for improved staff member education about screen time recommendations and the potential adverse health risks of too much screen time.

Post-presentation evaluation. The post-presentation evaluations were administered to and completed by all six staff members immediately following the presentation and question and answer session. All six staff members responded *yes* to the first 10 questions. Additional

feedback included “excellent brochure”, “brochure is fantastic”, “algorithm is great, easy to use and follow”, “information presented in an easy to understand manner”, and “excellent slides and quality of patient education handouts”.

Outcomes

Prior to implementation of the DNP project, three goals and expected outcomes were identified (see Goals, Objectives, and Expected Outcomes section). These three goals and the actual outcomes are discussed below.

Goal 1. Complete an Integrative Review of the Literature

The integrative review of the literature was completed and found successful screen time reduction strategies that can be implemented in the primary care setting for children younger than 6-years-old. Ten studies were selected, reviewed, and analyzed based on key terms and appropriate inclusion and exclusion criteria. The studies included two systematic reviews/meta-analyses, five RCTs, two pilot RCTs, and one pilot non-RCT, ranging in quality of evidence from Level IA to Level IIC. Education for providers and families was the primary intervention with many of the research studies sharing common educational topics that were also in line with the AAP advisory council’s 2016 policy statement about screen time and their recommendations. A long-lasting intervention over the course of several visits was more successful than a one-time intervention. The use of motivational interviewing also resulted in an increased reduction in screen time. The results of the integrative review support a primary care based approach to screen time reduction with patient education as the primary intervention conducted at every wellness visit.

Goal 2. Create an Evidence-Based, Comprehensive Screen Time Reduction Toolkit for Primary Care Providers

From the integrative review findings, a screen time reduction toolkit was successfully created. The toolkit includes education for providers about increased risk for language delays with excessive screen time in children younger than 6-years-old and evidence-based strategies to reduce screen time. The 2-QAST, a standardized screen time assessment tool that is quick and efficient to perform, is included in the toolkit. Additionally, the DNP student created a screen time reduction algorithm to guide patient education and referrals. Per the post-presentation evaluations, staff members found the algorithm helpful and easy to use. Appropriate educational materials were created to include a Family Media Use Plan (adapted from the AAP), a brochure, a poster, and a list of useful websites to give to families. The brochure and poster include a bulleted summary of screen time reduction recommendations allowing for clinician ease of use. Per the post-presentation evaluation responses, staff members were impressed with the educational materials, especially the brochure.

Goal 3. Deliver a High Quality, Professional Presentation to Educate Providers on Use of the Screen Time Reduction Toolkit

A presentation of the toolkit with a summary of the DNP project and integrative review findings was given to pediatric staff members and met all objectives. Participants included two pediatricians, two pediatric registered nurses, and two medical technicians. The presentation was limited to 1 hr to ensure maximal participation and included a pre-presentation survey and post-presentation evaluation. The post-presentation evaluations showed that staff members found the presentation timely, educational, and professional. They found the slides informative and believed the presentation enhanced their understanding and knowledge about screen time

recommendations and reduction strategies. A question and answer session after the presentation addressed any unclear information and allowed for more discussion on how the clinic could improve its process in providing more education during wellness visits. An electronic copy of the toolkit was burned to a CD-ROM and given to the Pediatric Clinic's Nurse Manager for implementation.

Discussion

Influence on Knowledge and Beliefs

The HBM served as the framework for this educational intervention. According to the model, health-promoting behavior is triggered when the perceived severity, perceived susceptibility, and perceived benefit of a health behavior coupled with cues to action overcome perceived barriers. For this intervention to be applied successfully in the primary care setting, providers must believe that excessive screen time for young children is a significant issue because it increases their risk for language developmental delays and other health problems. They must also believe that screen time reduction education is beneficial and be confident in their ability to discuss screen time with patients and their families. Additionally, providers must be given useful tools and techniques to provide this education in an effective and efficient way. Finally, providers must believe that these tools and techniques will be enough to overcome any barriers.

The pre-presentation survey, created after the HBM, was important to this project because it assessed staff members' perceptions about the importance of screen time reduction, clinical barriers they faced that prevented them from doing screen time education, and what they felt would be useful in order to perform screen time reduction education. Overall, staff members had high perceived seriousness (83%), perceived susceptibility (83%), and perceived benefit

(100%). This was a very positive finding. Staff members' attitudes and beliefs about screen time for young children were in agreement with the principles of this project. Attitudes and beliefs are not easy to change; however, the barriers they identified were more concrete and can be overcome. Two of the barriers identified included not having enough personal knowledge about the developmental risks associated with too much screen time and the potential for parental resistance to screen time reduction advice. The toolkit includes education for clinicians and patient education handouts. These resources will improve staff members' knowledge, thereby boosting their confidence and ability to discuss screen time with families. Also, the patient education handouts are an excellent way to diffuse resistance because staff members can tell parents to read the information at their own leisure. The third barrier identified was time constraints during wellness visits. Unfortunately, no policy or procedure changes were made in the clinic as part of this project. Still, the patient education brochure and poster contain a bulleted summary of screen time reduction strategies, which makes providing screen time education organized and quick to deliver in just a few minutes. The barriers disappear when the toolkit is used in its full capacity.

Finally, *cues to action* are the tools or techniques that would actually trigger staff members to implement screen time reduction education during wellness visits. As staff members requested in the pre-presentation surveys, the toolkit includes visual aids, handouts, and education for staff members about the developmental risks associated with too much screen time. One staff member suggested having patients watch an educational video covering several anticipatory guidance topics. An educational video to accompany this toolkit would be an excellent project to pursue in the future. Also, staff members again requested increasing the time for wellness visits to 30 min. Although no changes to clinic policies or procedures were made,

the patient education handouts, especially the poster and brochure, were designed to provide information quickly to patients and their families with minimal impact on the visit. The toolkit and patient education resources are in line with the *cues to action* identified by the staff members on their pre-presentation surveys. Staff members already believe screen time is an issue for young children and is associated with health risks. The toolkit dissolves barriers and addresses a majority of the *cues to action* identified by staff members. In fact, the post-presentation evaluations revealed that all staff members felt the presentation was informative and increased their knowledge and understanding of the topic. Staff members were impressed with the quality of the patient education handouts and found the algorithm easy to navigate. Therefore, there is a high likelihood for the clinic to successfully implement the toolkit and improve screen time education for staff members, patients, and their families.

Use of the Integrative Review and Screen Time Reduction Toolkit

The *Screen Time Reduction Toolkit* is useful in all pediatric primary care settings and inexpensive in its application. The purpose of the toolkit is to educate providers and families about health risks, specifically language developmental delays, that can result from excessive screen time, current screen time recommendations, and evidence-based strategies that can be used to reduce screen time. The toolkit's algorithm guides providers through a quick assessment of screen time behaviors called the 2-QAST and includes screen time education appropriate to the patient's age. The algorithm also lists the patient education resources included in the toolkit as well as online resources and community services. The DNP student recommends that a screen time assessment be performed and education be given at every wellness visit from 2-months-old to 5-years-old.

Before implementing this toolkit, the DNP student recommends completion of the pre-presentation survey to assess for *perceived barriers* and *cues to action*. This information will be useful to individualize the implementation of the toolkit to the specific needs of the clinic and its providers. Only 16% of pediatric providers discuss screen time with patients and their families, which is extremely low. The DNP student hopes to significantly improve this rate through use of the toolkit to enhance providers' knowledge about screen time and thereby improve their confidence in providing screen time education and empower them to act as advocates for screen time reduction. Multiple educational discussions about screen time with providers may ultimately influence parents to properly manage their children's screen time at home.

Limitations

Conducting the pre-presentation survey as part of a focus group to help guide the creation of the toolkit would have been a useful endeavor and allowed for some additional discussion time. Survey results and comments from the discussion could have then be incorporated into the toolkit design at its inception. Also, only six staff members were able to attend. More participants would have allowed for additional feedback regarding *perceived barriers* and more ideas for *cues to action*. Due to academic time constraints, this DNP project was limited to an educational intervention. With more time, the clinic would be given the option to implement the toolkit on their own, and then complete follow-up surveys a few months later to evaluate its effectiveness in practice.

Finally, the integrative review was specific to screen time reduction strategies for children under 6-years-old, and the association between excessive screen time and language developmental delays was the only health risk studied. Therefore, the toolkit may not be practical

for use with other age groups or for preventing other health problems known to be associated with excessive screen time.

Future Recommendations

Because this project was an educational intervention, the next step is to actually implement the toolkit and evaluate its usefulness in practice. Also, creating a screen time educational video aligned with the toolkit and shown to patients and their families as part of the wellness visit would be another intervention to pursue. Finally, collecting actual data on whether implementation of the toolkit decreased screen time among young children as expected would further support clinical use of the toolkit.

A delay in language development is only one of the many developmental, physical, and psychosocial adverse effects associated with excessive screen time, including aggressive and violent behavior, obesity, and smoking. This toolkit serves as a foundational resource to be expanded and enhanced through post-doctoral work such as adding more interventions to the algorithm to address additional health risks.

Ethics and Human Subjects Protection

This project was deemed exempt from Internal Review Board (IRB) approval (see Appendix E). The project did not involve any interaction or intervention with patients, family members, or medical records. The presentation of the integrative review findings and toolkit was to outpatient pediatric providers, registered nurses, and medical technicians. Participation was 100% voluntary. The data collected was an assessment of knowledge and personal opinions about the presentation topic.

Conclusion

With new screen technologies constantly being developed, childhood is becoming increasingly enveloped into a digital world. Many research studies have proven that excessive screen time is associated with increased health risks, especially in early childhood where face-to-face human interaction is crucial for language development. Members of the AAP have been releasing policy statements concerning the effects of children's media use since 1984 when the Task Force for Children and Television was created. Despite increasing opportunities for screen time and evidence on the risks of too much screen time, an astounding 84% of primary care providers do not advocate for screen time reduction during clinic visits. This may partially explain why a majority of young children watch 4-5 hours of television daily; their caregivers may not know the risks involved.

The most important immediate action is to increase the number of providers who give screen time education to patients and their families. Knowledge empowers change. The toolkit provides the education that providers need to be knowledgeable as well as confident in their ability to discuss screen time with families. The 2-QAST is simple, easy to remember, and applies to all patients. The algorithm guides providers to additional resources they can use to refer their patients to community services. The patient education handouts make the information more accessible in an organized and easy-to-follow format. Being consistent about providing a few minutes of screen time education at every wellness visit from 2-months-old to 5-years-old sets a solid foundation for parents and children to create healthier screen time habits at home.

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Appendix A

Health Belief Model: Chosen Format for Use in This Project

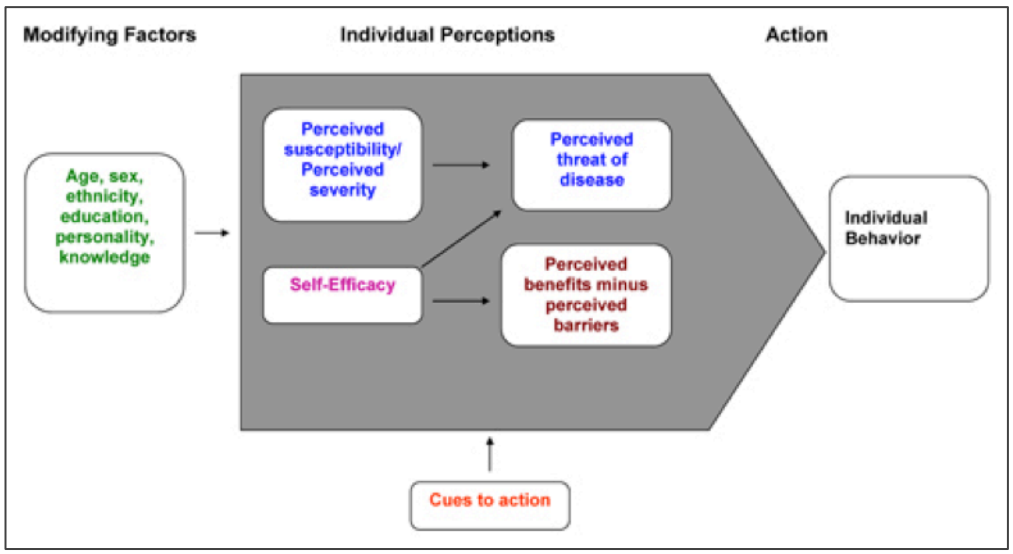

Figure 1. Chosen format of the Health Belief Model used as the theoretical framework for the DNP project. Reprinted from *Health Behavior and Health Education: Theory, Research, and Practice (4th ed.)*. K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), 2008, Retrieved from http://www.med.upenn.edu/hbhe4/part2-ch3-main-constructs.shtml. Copyright 2008 by John Wiley & Sons, Inc.

Appendix B

Toolkit and Presentation

Reducing Screen Time for Children Under Age 6 to Prevent Language Delays

A Toolkit for Primary Care Providers

MARCH 2017

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Reducing Screen Time for Children Under Age 6 to Prevent Language Delays

A Toolkit for Primary Care Providers

Table of Contents

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Toolkit Disclaimer: The Screen Time Reduction Toolkit was compiled by Cristina E. Kuta, DNPc. Specific components of the toolkit were created by the author, as cited. Sources for the narrative sections of the toolkit are cited in *References*. Photos, website links, and articles included in the toolkit are public record.

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Thank you to my husband, Matthew Kuta, whose love and unending encouragement motivated me through this project.

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Toolkit At-a-Glance

This electronic toolkit is a comprehensive, easy-to-use guide that pediatric primary care providers can use to advocate for screen time reduction for children younger than 6-years-old. The toolkit is modeled like an Internet web page and includes hyperlinks embedded throughout the document to navigate all sections of the toolkit. A screen time reduction algorithm is included to illustrate how to effectively utilize this toolkit in practice.

QUICK LINKS:

Brochure

Poster

Family Media Use Plan

AAP 2016 Policy Statement

Provider education on the association between excessive screen time and language developmental delays is described, and a summary of the findings from an integrative review of the literature is provided. The 2-Question Assessment for Screen Time (2-QAST), recommended by the American Academy of Pediatrics (AAP) advisory council in 2013, is presented as a time-efficient assessment to be performed at every wellness visit. Topics for discussion are showcased in various patient education formats: brochure, poster, and family media use plan. These items can be printed and displayed or given to patients. The brochure and poster each contain a bulleted summary of important screen time reduction education topics to prompt providers and facilitate brief discussion. The toolkit also contains lists of helpful websites that can be given to families as well as local child development community resources for provider referrals. Motivational interviewing resources and the 2016 AAP policy statement and technical report are also embedded references.

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Introduction

Purpose

The purpose of this toolkit is to provide education for pediatric primary care providers, patients and their families on the adverse effects of excessive screen time on language development in children younger than 6-years-old and evidence-based screen time reduction strategies that can be implemented in outpatient primary care clinics at all wellness visits.

How does excessive screen time affect language development?

Language development and vocabulary growth in children younger than 6-years-old are directly related to the amount of time parents spend speaking to them. Therefore, excessive screen time can interfere with a young child's language development because parents spend less time interacting with and talking to their child. This is a significant issue because language development is biologically correlated to age, and these early years are crucial for language acquisition, especially phonetics and syntax. Furthermore, receptive language delays by age 5 are a significant risk factor for social and emotional problems in adulthood.

Several studies have supported this association between screen time in children under 6-years-old and language delays. Children ages 15 to 35 months who were exposed to 137 min/day of television were 3.3 times more likely to

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develop a language developmental delay compared to children who watched less than 20 min/day of television. Hispanic infants and toddlers who watched more than 2 hr/day had 5.5 times the risk of scoring lower in communication on the ASQ-3 after 1 year compared to those children who watched less than 2 hr/day. Furthermore, children who started watching television before 12 months of age and watched more than 2 hr/day were 6 times more likely to develop a language delay. Although studies on the relationship between screen time and language development are few and mostly limited to observational or quasi-experimental methods, findings have remained consistent that increased screen time is associated with an increased risk for language developmental delays.

Human interaction has a strong influence on a young child's language development. Infants, specifically, learn best from live sessions versus televised ones, and social feedback is an important predictor for the quantity and quality of infant vocalizations. For children younger than 6-years-old, screen time disrupts the social experience of learning language and prevents opportunities for caregivers to model two-way conversation and convey thoughts in sentences rather than single words. In a group of 2-3-year-old children, for every 1 hr of television watched, the children were exposed to 500-1000 fewer words. The children also had significant reductions in their vocalizations, vocalization duration, and conversational turns with more time spent watching television. Also, parents frequently spoke in shorter, one-word sentences and spoke less words overall to their children when the television was on.

The amount of time caregivers interact and converse with their children is also associated with risk for developing language delays. Children with documented language delays spent an average of 7 hr/day with their caregivers in which 3.6 of those hours were spent in conversation compared to children with normal language development who spent an average of 9.3 hr/day with their caregivers in which 5.8 of those hours were spent in

conversation. Furthermore, children who watched television alone were 8.5 times more likely to develop a language delay.

What does the AAP recommend for screen time, and how much screen time are young children actually being exposed to on a daily basis?

The AAP recognizes the health implications of too much screen time. In addition to language delays, children are at increased risk for obesity, violence and aggression, loss of social skills, attention problems, anxiety and depression, sleep deprivation, vision problems, migraine headaches, repetitive motion syndrome and arthritis. In January 2017, the AAP created an online Media and Children Communication Toolkit, which encourages families to create a media use plan to gain awareness of media use habits and adopt methods to decrease use. In their most recent 2016 policy statement, the AAP advocates for no screen time in children under the age of 18-24 months, other than video-chatting, and to limit screen time to less than 1 hr/day of high-quality programming and apps for children ages 2-5 because of the harmful impact it might have on the developing brain. They also recommend caregivers co-view and co-use media, not allow screen time during meals or for 1 hr before bedtime, and remove TVs and other media devices from children's bedrooms. Still, according to parent surveys, 90% of children younger than 2-years-old are exposed to 1 to 2 hr/day of television with 14% of them watching greater than 2 hr/day of television. Thirty-eight percent of infants use mobile devices like smartphones. The typical American child before age 5 watches 4.5 hr/day of television.

Many caregivers believe that screen media can have a positive impact on their child's cognitive development because many programs and products advertise this as a benefit. Caregivers who believe a television program or video

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is educational and important to healthy development are twice as likely to have the television on for extended periods of time. An interview with a group of Hispanic families found limited knowledge among caregivers about the potential risks of too much screen time, but the caregivers also reported they would reduce their children's screen time if they were better educated about this issue. Improved education and awareness about the potential for language delays in young children due to excessive screen time can empower families to reduce screen time in their homes.

What opportunities exist in primary care to address screen time with families?

The primary care setting offers excellent opportunities to promote screen reduction education to young children and their families. From birth to age 5, children will see their provider a minimum of 12 times for routine wellness visits. Despite this opportunity only 16% of pediatricians in the United States ask patients and their families about their media use, and this statistic has not changed in the last 20 years despite the production of new devices providing more opportunities for screen time, including tablets, portable DVD players, and smartphones. This toolkit offers primary care providers a timesaving approach to assessing children's screen time during routine wellness visits and provides education for providers and families to raise awareness about the risks of excessive screen time for young children and evidence-based strategies to decrease screen time in the home.

Evidence-Based Strategies to Reduce Screen Time

The findings from an integrative review of 10 studies were used to create this toolkit. The integrative review included 2 systematic review/meta-analyses, 4 randomized controlled trials [RCT], 2 pilot RCTs, and 1 pilot non-RCT. There were significant reductions in screen time by an average of 34 min/day across 9 of these studies using a mix of the following interventions:

1. Recurrent education using family-centered collaborative negotiation and printed materials over multiple visits about screen time recommendations and to improve knowledge about excessive screen time and risks of language delay
2. Setting rules for use – i.e. no screens during family mealtimes or for 1 hour before bed
3. Co-viewing and co-using high-quality media programming and apps with children
4. Displacing screen time with other activities – i.e. reading books, creative play
5. Removing TVs and other media devices from children's bedrooms

Of the seven experimental studies, four studies (3 RCTs, 1 pilot non-RCT) applied interventions in the primary care setting. The interventions in the remaining three studies (1 RCT, 2 pilot RCTs) were applied in daycare/preschool- and community-based settings. These studies were included in the integrative review because the interventions were similar and could be easily translated to the primary care setting.

Sources: Birken et al., 2012; Campbell et al., 2013; Dennison et al., 2004; Downing et al., 2016; Hinkley et al., 2015; Taveras et al., 2011a; Taveras et al., 2011b; Wahi et al., 2011; Yilmaz et al., 2014; Zimmerman et al., 2012

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Screen Time Reduction

ALGORITHM

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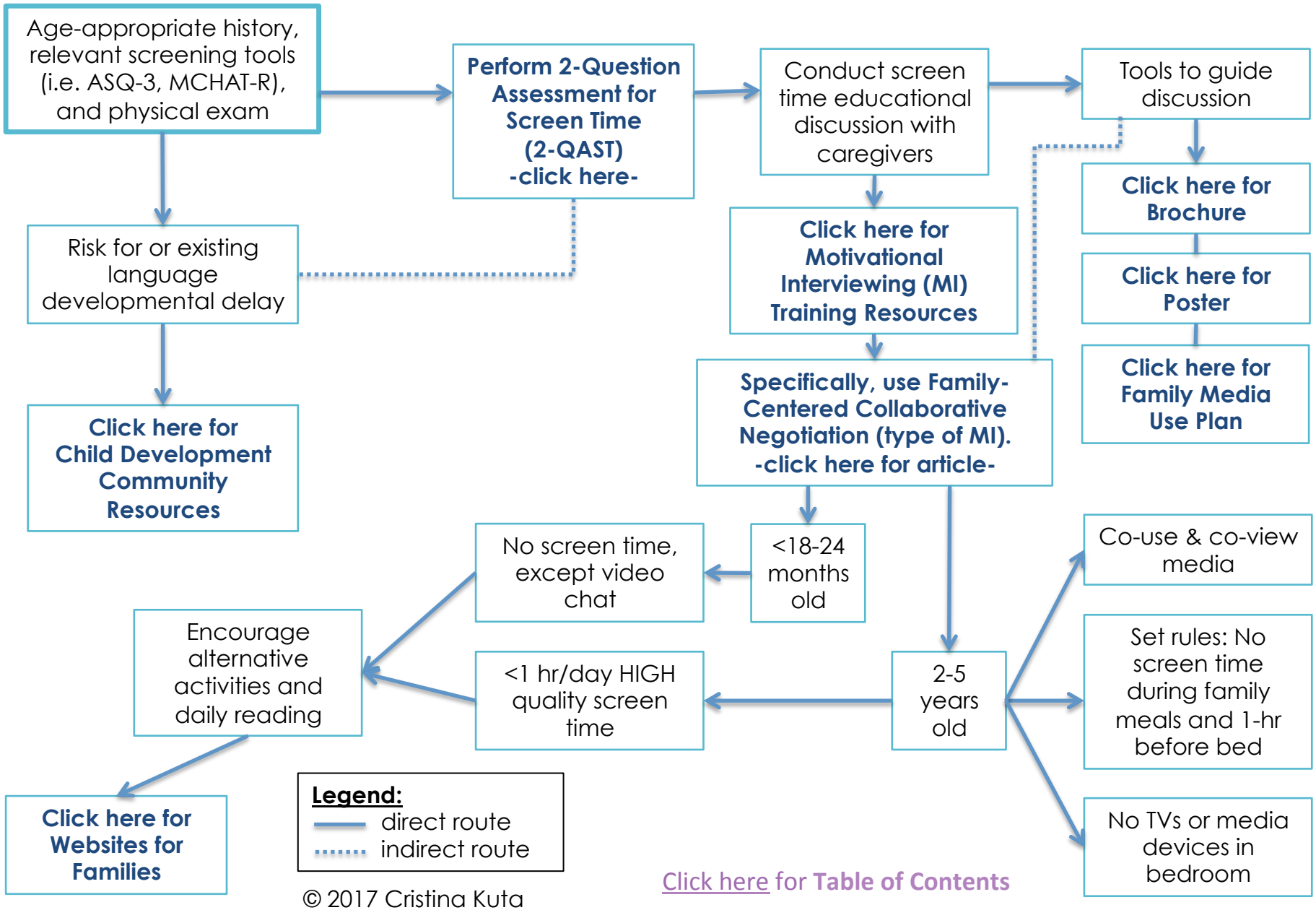
Screen Time Reduction Algorithm



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Actions for Primary Care Providers

The 2-Question Assessment for Screen Time (2-QAST), recommended by the AAP in 2013, is a simple way to initiate dialogue between primary care providers and families about screen time (see page 17-18):

1. **How much screen time (min/hr) does your child consume daily?**
2. **Is there a TV or mobile media device (tablet/iPad, cell phone, computer) in your child's bedroom?**

The 2-QAST should be added to the encounter template for all 12 routine wellness visits from age 2-months to 5-years. The provider should use family-centered collaborative negotiation (see pages 19 and 20-30) to engage caregivers in brief educational discussions about the AAP screen time recommendations, risk for language developmental delays with excessive screen time, and strategies for reducing screen time in the home. The discussion should include the following:

1. Excessive screen time leads to increased risk of language developmental delays in children younger than 6-years-old.
2. Discourage screen time for children younger than 18-24 months, except video-chat.
3. Encourage a 1-hour daily limit of high-quality screen time for children 2- to 5-years-old. Direct families to Common Sense Media at **www.commonsensemedia.org** to find age-appropriate high-quality media including movies, games, apps, websites, TV shows, books, and music from over 20,000 listings.
4. Encourage parents to create a Family Media Use Plan at: **www.healthychildren.org/mediauseplan**
5. Encourage caregivers to view and use media with their child.

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6. Encourage caregivers to read to their children for at least 20 min/day using an interactive approach.
7. Encourage caregivers to not allow screens during family meal times and for 1-hour before bedtime.
8. Encourage caregivers to remove televisions and other media devices (tablets/iPads, cell phones, computers) from their child's bedroom.

The provider can also use printed brochures (see pages 31-33) or posters (see pages 34-35) to facilitate the discussion. If a caregiver is unable to access or print out their personalized online Family Media Use Plan, providers can supply the caregiver with a paper copy (see page 36-39). Providers should also direct caregivers to educational websites that discuss the importance of screen time reduction, screen time reduction strategies, and high-quality screen time options (see page 40).

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Family-Centered Collaborative Negotiation Overview

Family-centered collaborative negotiation is a form of Motivational Interviewing (MI) designed to be brief, taking 5-15 min, making it appropriate and effective for the primary care setting. The objective of this type of communication is to promote healthy behaviors like screen time reduction. In family-centered collaborative negotiation, the provider assumes an empathetic and collaborative partnership with the family rather than the traditional objective and prescriptive approach. The family should actively participate in the discussion, and, in the end, decide what changes they will make in creating a healthier lifestyle. The following table describes the basic principles of family-centered collaborative negotiation and how providers can use these principles when approaching patients and their families about lifestyle changes, especially screen time reduction. A case example of this process can be reviewed on pages 20-30 of this toolkit. MI resources can be found on page 19 of this toolkit.

Principles
• **Be patient-centered** • **Establish a partnership with the patient and their family** • **Develop discrepancy between current behavior and lifestyle goals** • **Explore and resolve ambivalence about engaging in new behavior** • **Elicit self-motivational statements** • **Provide no unsolicited advice** • **Roll with resistance** • **Support self-efficacy**
Approach in Practice

• **Collaborative agenda setting—ensures patients and their families are active, willing participants**
  ○ **Asking permission ensures patient and family engagement**
  ○ **Use open-ended questions—starts conversation moving**
  ○ **Listen reflectively—keeps conversation moving, verifies understanding**
• **Decisions and goals—only patient and their family can decide to change**
• **Elicit change talk—explore interest, confidence, and readiness to change**
• **Exchange information—have patient and family interpret information provided**

Source: Tyler & Horner, 2008

Conclusion

With new screen technologies constantly being developed, childhood is becoming increasingly enveloped into a digital world. Many research studies have proven that excessive screen time is associated with increased health risks, especially in early childhood where face-to-face human interaction is crucial for language development. Members of the American Academy of Pediatrics have been releasing policy statements concerning the effects of children's media use since 1984 when the Task Force for Children and Television was created. Despite increasing opportunities for screen time and evidence on the risks of too much screen time, an astounding 84% of primary care providers do not advocate for screen time reduction during clinic visits. This may partially explain why a majority of young children watch 4-5 hours of TV daily; their caregivers may not know the risks involved.

The most important immediate action is to increase the number of providers who give screen time education to patients and their families. Knowledge empowers change. This toolkit provides the education that providers need to be knowledgeable as well as confident in their ability to discuss screen time with families. The 2-QAST is simple, easy to remember, and applies to all patients. The algorithm guides providers to additional resources they can use to refer their patients to community services. The patient education handouts make the information more accessible in an organized and easy-to-follow format. Being consistent about providing a few minutes of screen time education at every wellness visit from 2-months-old to 5-years-old sets a solid foundation for parents and children to create healthier screen time habits at home. A delay in language development is only one of the many developmental, physical, and psychosocial adverse effects associated with excessive screen time. This toolkit serves as a foundational resource to be expanded and enhanced in the future.

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Actions for Primary Care Providers:

2-QAST

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2-QAST

1. How much screen time does your child consume daily?
2. Is there a TV or mobile media device (tablet/iPad, cell phone, computer) in your child's bedroom?

Motivational Interviewing Resources

UMass Med

http://www.umassmed.edu/cipc/motivational-interviewing/overview/

The University of Massachusetts Medical School offers online Motivational Interviewing (MI) training from beginner to expert level. They offer CEs, a Certificate of Intensive Training in Motivational Interviewing, and opportunities for individual coaching.

MINT

http://www.motivationalinterviewing.org

The Motivational Interviewing Network of Trainers (MINT) is an organization that promotes MI and offers resources for training and practice.

http://www.motivationalinterviewing.org/list-events

The events calendar lists dates and locations of live MI training courses to include locations in NC (Asheville, Carrboro, Charlotte, Greensboro):

Book List: **http://www.motivationalinterviewing.org/books**
Multimedia Resources: **http://www.motivationalinterviewing.org/multimedia**

CCNC

https://www.communitycarenc.org/media/files/mi-guide.pdf

Community Care of North Carolina developed a MI Resource Guide that offers excellent tools for practicing MI techniques in clinical practice.

https://vimeo.com/135867754

Free 1-hr webinar hosted by Dr. Chip Watkins from the Carolinas Center for Medical Excellence, produced in 2015.

Article:

Family-Centered Collaborative Negotiation

(Tyler & Horner, 2008)

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PRACTICE

Family-centered collaborative negotiation: A model for facilitating behavior change in primary care

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Keywords
Behavior change; family-centered intervention; child health; primary care; obesity.

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Abstract

Purpose: To describe a parent–child-based model that melds a family-centered interaction approach, Touchpoints, with brief negotiation strategies (an adaptation of motivational interviewing) to address health risks in children. An application of the model for addressing childhood overweight in the primary care setting is presented.
Data Sources: Selected research, theoretical, and clinical articles; national recommendations and guidelines; and a clinical case.
Conclusions: Lifestyle health behaviors are learned and reinforced within the family; thus, changes to promote child health require family involvement. Interventions that engage parents and support parent–child relationships, while enhancing motivation and the abilities to change behavior, are recommended.
Implications for Practice: Primary care is an appropriate setting for addressing lifestyle health behaviors. A collaborative partnership, rather than a prescriptive manner, is advocated for primary care providers when working to facilitate health-promoting behavior.

Introduction

Morbidity and mortality associated with typical lifestyles of excessive dietary intake, low activity, inadequate sleep, and other poor health habits are impacting both quality of life and life expectancy, particularly among children (Centers for Disease Control and Prevention [CDC], National Center for Chronic Disease Prevention and Health Promotion, 2005; Haslam & James, 2005; See, Mensah, & Olopade, 2006). It is projected that for the first time in modern history, children will have more chronic diseases and reduced years of life than their parents (Daniels, 2006; Olshansky et al., 2005; van Dam, Willet, Manson, & Hu, 2006). The American Academy of Pediatrics (2001) adopted policy statements that describe the behavioral health problems of children as a "new morbidity" and identified issues such as obesity, chronic stress, divorce, single parenting, and depression as conditions that need to be addressed by primary care providers (PCPs) during routine healthcare visits. Thus, PCPs need skills for managing psychosocial concerns as well as approaches for lifestyle behavior intervention; however, many report that they lack these skills (Jonides, Buschbacher, & Barlow, 2002; O'Brien, Holubkov, & Reis, 2004). The purpose of this article is to describe a parent–child-based model that melds a family-centered interaction approach, Touchpoints (Brazelton, 1992), with brief negotiation strategies to address health risks in children. An application of the model for addressing overweight in children will be presented.

Background

Well-child visits are designed to facilitate the early detection of health risks and emerging health problems (Cifuentes et al., 2005; Simonian, 2006). The primary care setting offers many benefits for managing lifestyle-related health problems; in particular is the opportunity for incorporating health promotion and prevention counseling into routine well-child and episodic sick care visits. However, conventional health promotion and prevention approaches in primary care settings

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generally involve a passive approach in which information about health behaviors is delivered and supplemental materials are offered to clients to facilitate their adherence to the clinician's predetermined regimen (Glascoe, Oberklaid, Dworkin, & Trimm, 1998). In essence, this is a top-down management model. The effectiveness of such an approach is limited by the parents' abilities to implement the clinicians' plans and the resources available to support the parents as they struggle with changing lifestyle behaviors (Ariza, Greenberg, LeBailly, & Binns, 2005).

Although health promotion counseling can be initiated by PCPs, the reality is that health promotion is a family affair. The family is the context where "health is learned, lived, experienced, and the niche where multiple members encounter and respond to disease and illness across the life course" (Denham, 2003, p. 145). The family provides the resources to support health and make decisions about what they believe to be health-promoting actions (Denham). To effect real lifestyle change in at-risk children, it is imperative that family-based approaches be used. Yet, responses from PCPs indicate that many are not comfortable with parental conflicts that arise during discussions about changing lifestyle behaviors such as those needed to manage childhood overweight (Story et al., 2002). However, research has shown that client-centered and nonconfrontational approaches are effective in minimizing resistance to advice and in fostering relationships among clinicians and clients (Emmons & Rollnick, 2001). Additionally, the most consistently successful family interventions have been intensive programs involving frequent contact with behavioral specialists and inclusion of multiple controls and/or support components in the child's environment (Epstein, Roemmich, & Raynor, 2001). Thus, adaptations are needed for working with families in primary care settings.

Collaborative negotiation model

The collaborative negotiation model describes a process for promoting health and reducing health risk factors in primary care settings (Figure 1). The model contains three major constructs: (a) factors that affect the child's health and risk status, (b) a family-centered intervention with the PCP to negotiate behavior change, and (c) health indicators that reflect outcomes of the PCP–family interaction.

Child health profile

Children's health and risk status are influenced by contextual and dynamic factors. *Contextual factors* represent inherent biological conditions, such as the child's genetic makeup, race and ethnicity, and personal and family health history. In regard to a person's weight status, a clear genetic predisposition for obesity has been seen in studies of twins, other siblings, and family members, with the impact of genetic contribution estimated to be 30%–70% (Loos & Bouchard, 2003). While the child's genetic makeup establishes some limits on functioning, it does not predetermine the child's health outcomes. In fact, practice-based genetic counseling focuses on increasing health promotion to counterbalance genetic influences (Nussbaum, McInnes, & Willard, 2004). For example, familial history of early cardiovascular disease or type 2 diabetes is a strong genetic component, but lifestyle changes that promote weight management and nutrition balance can help prevent or delay the onset of these chronic conditions (Delahanty & Nathan, 2004; Hamman et al., 2006; Hayman et al., 2004; Knowler et al., 2002).

Race and ethnicity also have a profound impact on health. In the case of overweight, prevalence is twice the

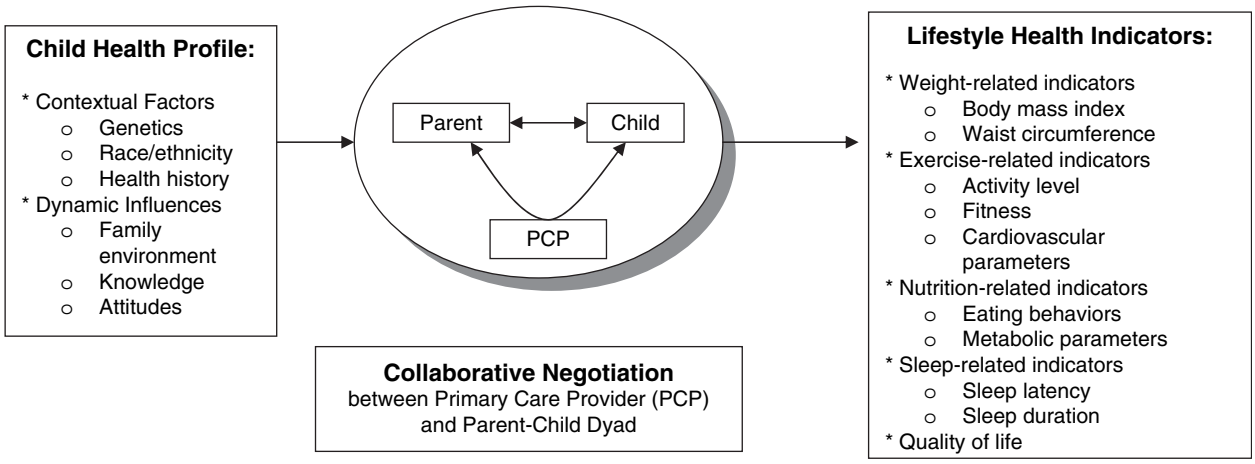

Figure 1 Family-centered collaborative negotiation model.

rate among minorities, with 24% of Mexican Hispanic and 20% of African American children aged 6–11 years classified as overweight as compared to 12% of non-Hispanic White children (Ogden, Flegal, Carroll, & Johnson, 2002). A review of nutrition-related research identified factors that contributed to children's overweight including limited food choices, lower access to affordable and quality foods, fewer family meals eaten together, and cultural food preferences that promote higher fat and salt consumption (Jenkins & Horner, 2005).

Dynamic influences on lifestyle behaviors include the family environment and parents' and children's knowledge and attitudes about health behaviors. Nader et al. (1996) found that family involvement increased children's knowledge and positively improved attitudes toward healthy lifestyle behaviors. Additionally, when family meals are a regular event, this becomes an important ritual in which parents communicate about family culture, traditions, and values (Mendoza & Fuentes-Afflick, 1999). Beliefs about what is healthful or unhealthy are communicated to children through the family conversations as well as actions and choices enacted by individual family members, and this serves to maintain the family's cultural continuity (Mendelson, 2003). So that when a parent encourages a child to "eat your vegetables, they help keep you healthy"; this is a powerful message for the child to hear and incorporate into his or her own belief systems (Brown & Ogden, 2004).

Practitioners who address the impact of the family environment on children's health can also make meaningful differences in lifestyle behaviors. This is substantiated by controlled randomized trials that demonstrated that early intervention and family-based behavioral approaches to weight management led to long-term weight loss in children (Connelly, Gargiula, & Reeve, 2002; Epstein, Myers, Raynor, & Saelens, 1998; Golan, Weizman, Apter, & Fainer, 1998). The landmark study by Epstein, Valoski, Wing, and McCurley (1990, 1994) with a 10-year follow-up demonstrated that interventions targeting parent–child versus child-only or no–specific family member target were more effective in long-term weight loss and maintenance.

Collaborative negotiation process

Family-centered collaborative negotiation focuses on health concerns that are defined through PCP–family discussions; strategies are then identified and adapted to fit the child's unique contextual and dynamic makeup. The collaborative negotiation process combines the Touchpoints approach (Brazelton, 1992) with the brief motivational interviewing approach that has been used to facilitate behavior change in a variety of settings and populations (Berg-Smith et al., 1999; Bernstein, Bernstein, & Levenson, 1997; Heather, Rollnick, Bell, & Richmond, 1996; Marlatt et al., 1998; Miller, Andrews, Wilbourne, & Bennett, 1998; Richmond, Heather, Kehoe, & Webster, 1995; Rollnick, Heather, Gold, & Hall, 1992; Saunders, Wilkins, & Phillips, 1995; Senft, Polen, Freeborn, & Hollis, 1997; Trigwell, Grant, & House, 1997).

Touchpoints model of care

The Touchpoints approach is based upon over three decades of research and clinical practice by Brazelton, a pediatrician who has both medical and psychoanalytic training. The model describes the predictable times in a child's development, characterized by spurts of growth and trying periods of regression, that often disrupt the child's life but also can result in disorganization and stress in the family unit. Brazelton's early work with mothers and infants demonstrated that when practitioners work as partners with parents to anticipate developmental or situational transitions, they could have a positive impact on the child's growth and development. Consequently, children have better outcomes in physical, social, emotional, and cognitive well-being (Brazelton, 1975a, 1975b, 1992). Brazelton's work has been expanded to families with older children (Brazelton & Sparrow, 2001) and has been implemented in over 70 sites (Brazelton Touchpoints Center, 2007; Brazelton, O'Brien, & Brandt, 1997; Percy, Stadlter, & Sands, 2002) and tested with different populations (Percy & McIntyre, 2001; Tyler, 2007). The guiding principles and assumptions of the Touchpoints approach are presented in Table 1.

Touchpoints differs from the traditional "problem-oriented" healthcare model in that it is a strength-based, as opposed to a deficit-based, model. In the traditional model, the healthcare provider assumes the expert role, whereas the Touchpoints model shifts away from the objective prescriptive approach to a more empathetic and collaborative partnership. For example, recognizing and valuing the positive influences that the parent has in care of the child bring the practitioner–parent–child together in care and support of the child and family, providing parents and children a sense of mastery or the belief in their capacity to master health promotion of a complex health problem (Brazelton & Sparrow, 2003).

The Touchpoints model provides a framework for applying behavioral change strategies with families. It is not a program or set of skills to be applied by practitioners but enhances programs and service delivery systems by adapting to the unique and diverse forces present in the family and individual practitioner.

Table 1 The guiding principles and assumptions of the Touchpoints model

Principles
Value and understand the relationship between you (i.e., PCP) and the parent
Use the behavior of the child as your (PCP) language
Value passion where ever you (PCP) find it
Focus on the parent–child relationship
Value disorganization
Look for opportunities to support mastery
Recognize the beliefs and biases that you (PCP) bring to the interaction
Be willing to discuss matters that go beyond your (PCP) traditional role
Assumptions about parents
The parent is the expert on his or her child
All parents have strengths
All parents want to do well by their child
All parents have something critical to share at each developmental stage
All parents have ambivalent feelings
Parenting is a process built on trial and error
Assumptions about practitioners
Each practitioner is the expert within the context of his or her practice setting
Practitioners want to be competent
Practitioners need to reflect on their contribution to parent–provider interactions

PCP, primary care provider.

Table 2 Brief negotiation principles and approach

Principles
Be client centered
Establish a partnership with client
Develop discrepancy between current behavior and lifestyle goals
Explore and resolve ambivalence about engaging in new behavior
Elicit self-motivational statements
Provide no unsolicited advice
Roll with resistance
Support self-efficacy
Approach in practice
• Collaborative agenda setting—ensures clients are active, willing participants
Asking permission—ensures continued client engagement
Use open-ended questions—starts conversation moving
Listen reflectively—keeps conversation moving, verifies understanding
• Decisions and goals—only the client can decide to make change
• Elicit change talk—explore interest, confidence, and readiness to change
• Exchange information—have client interpret information provided

Brief negotiation approach

This method is an adaptation of motivational interviewing (MI), which is a therapeutic technique that can be effective at increasing clients' motivation, or readiness, to change problem health behaviors (Miller & Rollnick, 2002). The basic components of MI are development of the clients' discrepancy between present behaviors and future goals, reduction of client resistance and ambivalence to making changes, use of reflective and empathic listening, and the reinforcement of self-motivational statements from the client. Originally, it was adapted from Miller's (1983) work in the addictions field where straightforward advice giving was met with resistance and arguments against change.

The components of MI have been incorporated into a brief format by practitioners for use in healthcare settings to encourage health promotion and lifestyle behavior change during routine consultations with patients (Table 2). Strategies and techniques used in this approach are referred to as "brief negotiations" because each strategy is designed to take 5–15 min to complete and the patient, not the practitioner, articulates what actions she or he will undertake (Rollnick, Heather, & Bell, 1992). Negotiation-based strategies involve four fundamental tasks: (a) setting a mutually agreeable agenda, (b) making decisions and setting targets, (c) assessing motivation and confidence regarding the planned actions, and (d) exchanging information (Rollnick, 1996). The essence or "spirit" of the method is a quiet and eliciting interpersonal counseling style, where the therapeutic relationship functions as a partnership rather than as an expert–recipient relationship (Emmons & Rollnick, 2001).

Brief motivational interviewing methods fit well with the Touchpoints model, and the negotiated process incorporates principles from both approaches to work with individuals in collaboration with family members to engage in behavior change. The collaborative negotiation intervention is delivered in the manner of having a dialogue or shared discussion about the health concerns of the family member(s). As concerns (i.e., weight, disordered eating, and inactivity) are explored and contributing risk behaviors are identified, the PCP employs strategies designed to elicit motivation to change from the parent and child. If a decision for a planned change is agreed upon, specific actions for change and confidence in their ability to enact the plan are discussed. During this exchange, supports and constraints are explored, as well as the anticipated effect of the planned change on family routines and individuals in the family. A key goal of the approach is to have parents and their children become active participants throughout the interaction, from identifying the behavior to change, sharing of information, to making the plan for attaining the desired health outcome.

Lifestyle health indicators

Health behaviors can impact multiple health outcomes. For example, engaging in regular vigorous physical

activity improves weight management, cardiovascular functioning, bone density, glucose uptake by muscles, sleep quality, and energy level and can reduce risk and reverse atherosclerosis (Daniels, 2006; Pate et al., 2006). Lifestyle health indicators can be sorted into categories that reflect the parent's and child's primary area of concern such as weight, exercise, nutrition, sleep, or overall quality of life (Figure 1).

Weight-related health indicators

Systematic reviews (Jain, 2004; Reilly et al., 2003) report associations between childhood overweight as defined by body mass index (BMI) at the 95th percentile or more for age and gender and cardiovascular risk factors, such as hypertension, dyslipidemia, hyperinsulinemia, insulin resistance, and left ventricular and endothelial abnormalities. More than half of overweight children aged 5–10 years were found to have at least one cardiovascular risk factor. Increased waist circumference also correlates with a cardiovascular risk profile (Higgins, Gower, Hunter, & Goran, 2001). Other physical consequences of overweight are diabetes (types 1 and 2), asthma, polycystic ovary syndrome, and orthopedic, hepatic, and sleep disorders (Jain; Reilly et al.).

Factors that contribute to weight problems can be attributed to genetic influences in terms of patterns of familial overweight (Agras, Hammer, McNicholas, & Kraemer, 2004) and lifestyle factors such as activity levels and nutrient intake (Chaput, Brunet, & Tremblay, 2006). Identification of risk factors can assist PCPs to identify children who need targeted interventions to prevent the numerous physical and psychological health problems that are attributed to childhood overweight (Agras et al.; Chaput et al.; Cohen, Tallia, Crabtree, & Young, 2005).

Exercise-related health indicators

Numerous reports of studies with adults demonstrate that increased physical activity substantially improves health outcomes, such as obesity, cardiovascular risk factors and disease, diabetes, hypertension, blood lipid disorders, cancer, arthritis, and depression (U.S. Department of Health and Human Services, 1996). In contrast, there are limited studies of exercise or physical activity benefits that have been conducted with children. In Epstein et al.'s (1994, 1998) 10-year longitudinal study, findings indicate that flexible lifestyle exercise may be superior to more structured and higher intensity aerobic exercise for weight control. For children, the U.S. guidelines recommend 60 min of moderate-to-vigorous physical activity daily, which can be accumulated throughout the day (Corbin & Pangrazi, 1998).

Many studies have focused on the lack of exercise or increased sedentary activity of children and associations with adverse health outcomes. There has been a consistent positive association found between the number of hours children watch television and the prevalence (Andersen, Crespo, Bartlett, Cheskin, & Pratt, 1998; Crespo et al., 2001) and degree (Gortmaker et al., 1996; Robinson, 1999) of overweight. Children between the ages of 8 and 13 watch television an average of 3.5 h a day (Roberts, Foehr, Rideout, & Brodie, 1999). In a longitudinal study of school-age girls, Davison, Marshall, and Birch (2006) found that being overweight at age 11 was 13 times more likely to occur among those girls who exceeded the recommended hours of television viewing between ages 7 and 11 than among girls who did not exceed recommended viewing times. Those of lower socioeconomic status and those who are Hispanic and African American watch more television than do children of higher socioeconomic families and those who are White, respectively (Crespo et al.; Gortmaker et al.; Robinson, 1999, 2001). However, children watch less television if they have parents who watch less television themselves and monitor children's television viewing (Woodward & Gradina, 2000).

Nutrition-related health indicators

Research on child nutrition and weight management is limited. While calorie-restrictive diets are not indicated for most overweight children because of potential effects on long-term linear growth (American Dietetic Association [ADA] Reports, 2004; Epstein et al., 1994), dietary changes that decrease calorie-dense foods and increase fruits and vegetables or nutrient-dense foods are advocated (ADA Reports; CDC, n.d.). Dietary guidelines that recommend consumption of five to nine servings of fruits and vegetables daily are based on substantial scientific evidence that addresses the quality of these foods as good sources of nutrients and their association with decreased cancer, cardiovascular disease, and hypertension in adults (CDC, n.d.). Diets high in fruits and vegetables are thought to aid in weight management by promoting satiety because of increased water and fiber content and through decreased fat content and energy density. In a review of behavioral interventions to modify dietary fruit, fat, and vegetable intake, Ammerman, Lindquist, Lohr, and Hersey (2002) found that goal setting increased average daily servings by 0.6. Use of theory-based interventions has also been found more effective in achieving positive dietary outcomes than nontheoretically based studies (Agency for Healthcare Research and Quality, 2000).

Sleep-related health indicators

Sleep is integral to human functioning in that restorative processes occur during sleep states (Liu, Liu, Owens, & Kaplan, 2005). Research with adults has identified linkages between sleep deficits and changes in carbohydrate

Table 3 Case example of the collaborative negotiation process

Family–PCP interaction	Brief negotiation	Touchpoints
PCP: I see that Augie's weight and height were taken today and her weight is above normal. Her blood pressure is also higher than it should be.	Exchange information	
Parent: Oh, really. Well, she is like her father's side of the family.		
PCP: So, she is like others in your husband's family.	Simple reflection: restating	
Parent: Yes, most of them are short and heavy.		
PCP: In addition to be being too heavy or overweight, who has high blood pressure, diabetes, high cholesterol, or heart disease in either his or your family?	Open question	
Parent: I know my mother-in-law has diabetes. Some aunts and uncles also have diabetes and some other problems, too.		
PCP: So, being heavy and having health problems, like diabetes, are in the family.	Simple reflection: summarizing	
Parent: Yes. I tell Augie to do something besides watch TV, like go outside and play.		
PCP: Sounds like you've been concerned about her not getting enough activity and maybe concerned about her weight, too.	Complex reflection: interpreting	Parent desires to do well by the child
Parent: (nods)		
PCP: You've encouraged her to be more active. That can be helpful, because being too big, weighing too much, can cause many health problems like diabetes and high blood pressure. I'll be giving Augie an examination today, and I'd like to spend a little time to talk with you both about a healthy weight. Is that okay with you? (Both parent and Augie nod)	Support by affirmation; mutual agenda setting; asking permission	Support mastery; value and understand the PCP–parent relationship
PCP: Augie, tell me some of the things you like to do.		
Child: I don't know, watch TV, be on the computer, ride my bike sometimes.		PCP interprets derogative language as "passion"
Parent: Yeah, she's really a couch potato.		
PCP: (To Augie) Okay, sometimes bike riding, but mom is concerned about the time sitting at the computer and watching TV.	Reflections: restating and reframing	
PCP: Tell me what a typical day is like at home.		Seek to understand the P-C relationship
Parent: Things are pretty bad right now. My husband and I are separated.	Complex reflection: interpreting	
PCP: That sounds stressful.		
Parent: Yeah. I've been going back to school in the evening. And my husband's not paying any child support.		
PCP: It's good that you were able to bring Augie to the clinic today with all that's going on. How are you managing the children, work, and school?	Support by affirmation; open-ended question	Focus on strengths; support mastery
Parent: My in-laws live close by; they help out. Augie and my son stay with them until I get home. Augie watches the novellas with her grandmother and they drink sodas… too many sodas. I don't buy them, unless we have company.		
PCP: So, Augie, your mother doesn't usually buy sodas, but you drink them at grandma's house. (She nods.) How many sodas do you usually have in a day?	Simple reflection: summarizing	Focus on child's behavior
Child: (shrugs shoulders)		
PCP: more than 2 or 3 a day?		
Child: (she nods)		
PCP: So most days you're at grandmother's, watch TV, and have more than 3 sodas. (Both nod, yes.)		
PCP: Are they diet sodas?		
Parent: No		
PCP: And this is the grandmother with diabetes.	State discrepancy between behaviors and goals; reflection, reframing; client centered; setting agenda; eliciting motivation and change talk	Value passion, negative responses may result from true concern; foster parent–child–PCP relationship
Parent: Yes, she is overweight, too. Her husband is always on her about what she eats, especially her Cokes.		
PCP: Sounds like your grandpa wants to keep her healthy. Augie, just like your mother and I want to help you. I have here a list of recommendations to help families have healthy lifestyles. We can talk about each one of these and I can tell you what other families have tried, but I'm interested in hearing what you think will work for you and Augie and others in the family.		

Table 3 Continued

Family–PCP interaction	Brief negotiation	Touchpoints
P-C: (They review the following list, which has colorful cartoon icons for each topic.) • Increase physical activity—at least one hour/day • Decrease TV/screen time—less than 2 hours/day • Drink 6–8 glasses water/day and only 1 cup of sugar drink/day • Eat 5–7 fruits and vegetables/day • Eat breakfast daily • Limit portion sizes	Making decisions and setting targets	
PCP: Making changes in each of these areas can improve health over a period of time. Which change would be something that you could work on?		
Parent: Increasing activity, decreasing TV and less soda, all would help, but realistically right now I think getting her to stop drinking sodas would make a big difference.		
PCP: Augie, how does that sound to you?		
Child: (Looks down and shrugs shoulders)	Roll with resistance	Acknowledge the disruption (disorganization) that this change will evoke
PCP: This will be a big change for her… and for the grandmother. How can we get the grandparents, especially grandma, to help with this?		
Parent: I'll just tell her that they need to quit letting Augie have the sodas.		
PCP: How is your relationship with the in-laws?	Open-ended question	
Parent: Usually pretty good, especially lately, with all that is going on at home.		
PCP: Okay. I'm going to ask you both some questions. (To parent) On a scale from 0 to 10, with 0 being "not important at all" to 10 being "very important," how important do you think it is for Augie to have no more than 1 cup of soda a day?	Eliciting change talk; exploring motivation	
Parent: 10		
PCP: Okay, so you think it is very important. Now, how confident are you that you will be able to help her and grandma to make this change, with 0 being "not confident at all" and 10 being "you feel very confident" that they can stop drinking the sodas.		
Parent: Maybe 6 or 7.		
PCP: Okay, that's great. Now tell me why did you say 6 or 7 instead of something higher like an 8?	Exploring barriers	
Parent: Well Augie cries when she does not get what she wants sometimes and her grandmother will give in to her.		
PCP: What do you think will help grandmother to not "give in?"		
Parent: I'm going to tell her that her doctor said she is too big and she needs to stop drinking sodas or she will get diabetes like her.		
PCP: That could work. Many times parents are able to make healthy changes for someone else, like for their child, or grandchild, when they may not be motivated to make the change for themselves.	Providing affirmation	
PCP: (Augie is asked the "How important" and "How able" questions. She shrugs her shoulders and although she has direct eye contact with the PCP, she does not provide verbal responses.) Augie, if you could have one small serving of soda a day or one juice drink a day, what would you choose, the juice or soda?	Roll with resistance (change approach)	
(The PCP continues by sharing information about offering healthy alternatives and being consistent with Augie, which will help reinforce the target behavior. Support and encouragement are provided to enhance efficacy for both parent and child. For example, stating that strategies, such as these have worked for others and that the PCP is confident they that will find ways to be successful and then asks that they return in a few weeks to discuss how their plan is working. The PCP suggests inviting the grandparents to the next visit. Written information containing recommendations and strategies for healthy eating and activity is also provided.)	Support self-efficacy; partnership with parent	Foster PCP–parent relationship

Note. P-C, parent–child; PCP, primary care provider.

metabolism. Knutson (2005) analyzed data collected as part of the National Longitudinal Study of Adolescent Health (Add Health) to determine associations between sleep duration and BMI in adolescents who were in grades 7–12. Findings indicated that sleep deficit was associated with overweight BMI for male adolescents such that for every hour of additional sleep, the adolescents would have 10% reduction in the risk for being overweight. Similarly in a study with 422 randomly selected school-age Canadian children, Chaput et al. (2006) found that sleep duration was negatively associated with children's BMI and waist circumferences. Tzischinsky and Latzer (2006) studied sleep quality and duration in overweight and normal-weight children and found that overweight children reported significantly more nighttime awakenings, snoring, and restless sleep than did normal-weight children.

Quality of life

Health-related quality of life can be negatively impacted when children experience frequent or increasing symptomatic episodes of chronic or recurrent health problems, when they are unable to participate in age-appropriate activities, and when their self-esteem or self-worth is lowered (Laforest et al., 2005; Obradović, van Dulmen, Yates, Carlson, & Egeland, 2006). For example, children with chronic health problems like asthma or diabetes can experience symptom exacerbations that limit their daily activities and reduce their quality of life (Sawyer et al., 2005). Overweight children can experience lower self-esteem that reduces their quality of life (Fallon et al., 2005). Participating in exercise and feeling confident in one's abilities to engage in physical activity have associated psychological benefits (Kim, 2004).

Application of the collaborative negotiation model: Overweight child

Current estimates of childhood obesity indicate that one in three school-age children is either overweight or at risk for overweight (National Center for Health Statistics, 2004). With the high prevalence of obesity in the United States, it is imperative that PCPs intervene with families at every opportunity to prevent and manage this health concern. A sample PCP–family interaction illustrating the collaborative negotiation is presented in Table 3 using the example of a Hispanic woman of Mexican descent who brought her 10-year-old daughter, Augie, for a periodic well-exam.

Conclusions

Healthcare providers are encouraged to use approaches that involve working with families to promote healthy lifestyle behaviors and thereby reduce health risks and prevent health problems (Cifuentes et al., 2005; Puczynski et al., 2005). Interventions that rely solely on advice giving most often do not substantially effect lifestyle changes and improve health, and they are frequently met with resistance from clients. The collaborative negotiation approach differs from the traditional prescriptive approach in which the management plan is determined by the healthcare provider. The negotiated process incorporates principles from well-established clinical approaches to work with individuals in collaboration with family members to engage in behavior change. Touchpoints, well known in pediatric settings, enhances and strengthens the relationships among parents, children, and the healthcare provider. Brief motivational interviewing methods in primary care settings have been found effective in helping individuals manage a variety of lifestyle behavioral health concerns. Furthermore, clinical populations have responded well to the patient-centered approach in which healthcare providers work with them to gain confidence and mastery in behavior change.

Time to develop skills and gain competence using brief negotiation strategies varies among providers; however, many PCPs, particularly those with a nursing background, will view this approach as similar to methods associated with establishing rapport, ensuring a trusting therapeutic relationship, and developing a health plan based on mutual goals. Little to no research, however, has been conducted using brief negotiation or motivational interviewing with parent–child dyads. With the behavioral health concerns of today's youth, the collaborative approach warrants investigation with this population and in a variety of healthcare settings.

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Patient Education:

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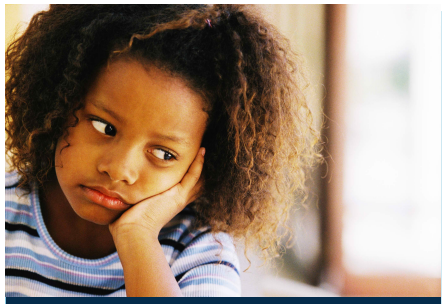

Additional Health Risks

Too much screen time can also lead to...

- Obesity
- Violence and aggression
- Loss of social skills
- Attention problems
- Anxiety and depression
- Sleep deprivation
- Vision problems
- Migraine headaches
- Repetitive motion syndrome
- Arthritis

Useful Websites

Find age-appropriate high-quality media from over 20,000 listings:

www.commonsensemedia.org

Create a Family Media Use Plan with AAP's interactive online tool:

www.healthychildren.org/mediauseplan

Learn more about the annual Screen-Free Week and Children's Book Week at:

www.screenfree.org

Go to AAP's Media and Children Communication Toolkit for more tips:

www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/pages/media-and-children.aspx

LESS - IS - MORE

Parent Strategies to Reduce Screen Time for Children Younger Than 6-Years-Old

Based on recommendations by the American Academy of Pediatrics

Prevent language delays – Reduce screen time!

Human interaction has a strong influence on language development. Language development and vocabulary growth in young children are directly related to the amount of time parents spend speaking to them. Too much screen time can interfere with language development because parents spend less time interacting with and talking to their child. Also, children who have certain types of language delays by age 5 are at risk for social and emotional problems in adulthood.

About 1 in 4 American children are exposed to an average of 4 hours of screen time every day. Research shows that for every 1 hour of television watched, children hear 500 to 1000 fewer words. Also, young children who are regularly exposed to more than 2 hours of screen time per day are 3 to 5 times more likely to develop a language delay. If children watch television and videos alone, their risk doubles.

The American Academy of Pediatrics (AAP) recommends no screen time for children under 18 to 24 months and a maximum of 1 hour per day of high-quality screen time for children ages 2 to 5 because of the potential harm it could have on the developing brain. The AAP's website features an interactive tool to create your own Family Media Use Plan and learn how to decrease screen time in your home. Be creative and schedule a screen-free week for your family or celebrate National Screen-Free Week and Children's Book Week in April/May. Give your children the best chance to develop their language skills in a healthy and natural way!

Quick Tips

- ☑ Read daily to your child for at least 20 minutes in an interactive way (pointing to pictures, asking questions)
- ☑ No screen time for children younger than 18-24 months, except video chatting
- ☑ Up to 1 hour per day high-quality screen time for children ages 2 to 5
- ☑ Create a Family Media Use Plan
- ☑ View and use media with your children
- ☑ Make family meal times screen-free
- ☑ No screen time 1 hour before bedtime
- ☑ No TVs or media devices in the bedroom

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LESS IS MORE

Prevent Language Delays – Reduce Screen Time!

- ✓ READ DAILY to your child for at least 20 minutes in an interactive way (pointing to pictures, asking questions)
- ✓ NO screen time for children younger than 18-24 months, except video chatting
- ✓ UP TO 1 HOUR PER DAY high-quality screen time for childen ages 2 to 5
  - Go to www.commonsensemedia.org for age-appropriate, quality media options
- ✓ View and use media WITH your children
- ✓ Make family meal times TECH-FREE
- ✓ NO screen time 1 hour before bedtime
- ✓ NO TVs or media devices in the bedroom

Patient Education:

FAMILY MEDIA USE PLAN

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Family Media Use Plan

For children younger than 6-years-old

This media plan was developed by the American Academy of Pediatrics (AAP) and is appropriate for children younger than 6-years-old. The interactive Web version for children of all ages is available at: www.healthychildren.org/English/media/Pages/default.aspx#wizard

Screen Free Zones

Mobile devices & TVs are not allowed in the following screen-free zones in our home:

☑ Kitchen or dining room table
- Keep family mealtimes & other family & social gatherings tech-free.

☑ Bedroom

Recharge devices overnight - outside your child's bedroom
- incoming messages & calls can interfere with your child's sleep
- help children avoid the temptation to use or check devices when they should be sleeping
- emitted light from devices charging may still effect the quality of your child's sleep

☑ Stroller

Screen Free Times

The AAP recommends no screen time for children under 18-24 months, except for video chatting. For children ages 2 to 5, limit screen time to less than 1 hour per day of quality programming or gaming.

As part of the daily routine, make devices like TVs, phones, computers, games or other electronics off limits at specific times. Dinnertime & before bedtime are important ones, but more extended breaks from technology each day may also be needed, especially for families with very young children.

We will not use mobile devices or other screens during the following times:

☑ One hour before bed

Using a mobile device or watching TV before bed can interfere with a child's sleep. When using screens in the evening:
- Turn the brightness on the screen down
- Don't play or watch media that are intense or scary in the evening

☑ Meal times

Do not watch TV or use mobile devices at meal times.

- It is associated with obesity & weight gain in children.
- It discourages from family interaction.

☑ Family time
- Family time may be whenever the family is together or it may be during specific times such as when in the car together or when walking to school together.

☑ While in the car, except for long trips

Choose & Diversify Your Media

Choose Media that is Worth Your Time:
More than 80,000 apps are labeled as educational, but little research has demonstrated their actual quality. Products pitched as "interactive" should require more than "pushing & swiping." Look to organizations like Common Sense Media (www.commonsensemedia.org) for reviews about age-appropriate apps, games & programs to guide you in making the best choices for your children.

Diversify Your Media:
Use media in a way that promotes interaction, connection & creativity. Different types of media may each have potential benefits, so media use is best diversified so that not all of one's time is spent doing one particular activity.

When we have recreational screen time, we will:

☑ Co-view (watching media with a parent or adult)
- Co-viewing allows for interaction & discussion
- Younger children learn better from media, educational shows & videos when they are co-viewed & there is parent-child interaction.

☑ Co-play (playing video games & using apps with a parent or adult)
- Younger children learn better from media when they share the experience with an adult.
- Helps parents to stay connected with their children & teens.
- Allows parents to have better sense of how their child is spending his or her time.

☑ Watch "educational" shows & use apps that have been reviewed & vetted by trusted sources to actually be educational such a PBS or Common Sense Media

☑ Use media to connect me to others
- Video chat with friends or relatives

☑ Use media to be creative
- Use apps & play games that let me use my creativity

☑ Limit background media
- This is distracting to me & limits the "talk time" I have with adults

☑ NOT spend lots of time watching fast-paced shows or apps with lots of bells & whistles
- These types of shows & apps may affect brain development & make it harder for children to concentrate later in life.

☑ NOT use media as a babysitter

☑ NOT play video games that are against our family's rules both at home & at someone else's house

☑ NOT download apps, movies, games without permission & asking an adult if they are appropriate for my age

☑ NOT visit new websites or video sites without asking permission

Balancing Online & Off-line Time

Media & digital devices are an integral part of our world today. The benefits of these devices, if used moderately & appropriately, can be great. But research has shown that face-to-face time with family, friends & teachers, plays a pivotal & even more important role in promoting children's learning & healthy development. Keep the face-to-face up front & don't let it get lost behind a stream of media & technology.

By decreasing screen time, we will have more time for:

☑ Playing outside

☑ Looking at books, going to the library

☑ Playing dress-up or make believe

☑ Playing with friends

☑ Being with my family

☑ Playing with blocks, Legos & puzzles

Sleep & Exercise

All children need plenty of sleep & exercise each day. On average, children younger than 6-years-old require 10-14 hours of sleep (including naps).

We will get enough sleep & exercise by doing the following:

☑ Turn off the TV or mobile device one hour before bedtime

☑ The blue light from the TV or mobile screen can interfere with sleep

☑ Vibrating & audio alerts can wake children from sleep

☑ Children may wake up to use devices in the middle of the night or early in the morning

Websites For Families

Common Sense Media

http://www.commonsensemedia.org

Search for age-appropriate high-quality media including movies, games, apps, websites, TV shows, books, and music from over 20,000 listings

PBS Kids

http://pbskids.org

Quality educational media content

American Academy of Pediatrics

http://www.healthychildren.org/mediauseplan

Create a Family Media Use Plan with AAP's interactive online tool

Campaign for a Commercial-Free Childhood

http://www.screenfree.org

Learn more about the annual Screen-Free Week and Children's Book Week

Talk with Me Baby

http://www.talkwithmebaby.org

Parenting ideas

Talking is Teaching: Talk, Read, Sing

http://talkingisteaching.org

Fun tips and resources to building language and literacy skills

Zero To Three

http://www.zerotothree.org

Play-based ideas to stimulate child development

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Child Development Community Resources for Wayne County, NC

Child Development Community Resources for Wayne County, NC

http://www.dpi.state.nc.us/docs/earlylearning/2013foundations-color.pdf

North Carolina Foundations Task Force: North Carolina Foundations for Early Learning and Development (2013) – referred to as *Foundations*. Provides age-appropriate goals and developmental indicators for infants, toddler, and preschoolers for both caregivers clinicians. Language development and communication is covered on pages 88-115 of the guide.

North Carolina Infant-Toddler Program

http://www.beearly.nc.gov

Serves families with children up to 3-years-old with special needs.

Wayne County, NC – Community Resources for Children

http://www.waynegov.com/DocumentCenter/Home/View/291

Children and Youth with Special Health Care Needs

Wayne County Resource Guide, published in 2012

North Carolina Pre-K Program

http://ncchildcare.dhhs.state.nc.us/general/mb_ncprek.asp

Partnership for Children of Wayne County, NC: Pre-K Program

http://pfcw.org/for-parents/nc-pre-k-for-parents/

List of Pre-K Programs in Wayne County, NC

http://www.pfcw.org/wp-content/uploads/NC-Pre-K-Site-Addresses.pdf

American Academy of Pediatrics:

2016 Policy Statement

Media and Young Minds

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POLICY STATEMENT Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Media and Young Minds

COUNCIL ON COMMUNICATIONS AND MEDIA

Infants, toddlers, and preschoolers are now growing up in environments saturated with a variety of traditional and new technologies, which they are adopting at increasing rates. Although there has been much hope for the educational potential of interactive media for young children, accompanied by fears about their overuse during this crucial period of rapid brain development, research in this area still remains limited. This policy statement reviews the existing literature on television, videos, and mobile/interactive technologies; their potential for educational benefit; and related health concerns for young children (0 to 5 years of age). The statement also highlights areas in which pediatric providers can offer specific guidance to families in managing their young children's media use, not only in terms of content or time limits, but also emphasizing the importance of parent–child shared media use and allowing the child time to take part in other developmentally healthy activities.

INTRODUCTION

Technologic innovation has transformed media and its role in the lives of infants and young children. More children, even in economically challenged households, are using newer digital technologies, such as interactive and mobile media, on a daily basis[1] and continue to be the target of intense marketing.[2] This policy statement addresses the influence of media on the health and development of children from 0 to 5 years of age, a time of critical brain development, building secure relationships, and establishing health behaviors.

INFANTS AND TODDLERS

Children younger than 2 years need hands-on exploration and social interaction with trusted caregivers to develop their cognitive, language, motor, and social-emotional skills. Because of their immature symbolic, memory, and attentional skills, infants and toddlers cannot learn from traditional digital media as they do from interactions with caregivers,[3] and they have difficulty transferring that knowledge to their 3-dimensional experience.[4] The chief factor that facilitates toddlers'

FREE

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learning from commercial media (starting around 15 months of age) is parents watching with them and reteaching the content.[5,6]

The interactivity of touchscreens enables applications (apps) to identify when a child responds accurately and then tailor its responses, thereby supporting children at their levels of competence. Emerging evidence shows that at 24 months of age, children can learn words from live video-chatting with a responsive adult[7] or from an interactive touchscreen interface that scaffolds the child to choose the relevant answers.[8] Starting at 15 months of age, toddlers can learn novel words from touchscreens in laboratory-based studies but have trouble transferring this knowledge to the 3-dimensional world.[9] However, it should be noted that these experiments used specially designed apps that are not commercially available.

Many parents now use video-chat (eg, Skype, FaceTime) as an interactive media form that facilitates social connection with distant relatives. New evidence shows that infants and toddlers regularly engage in video-chatting,[10] but the same principles regarding need for parental support would apply in order for infants and toddlers to understand what they are seeing.

In summary, for children younger than 2 years, evidence for benefits of media is still limited, adult interaction with the child during media use is crucial, and there continues to be evidence of harm from excessive digital media use, as described later in this statement.

PRESCHOOL MEDIA AND LEARNING

Well-designed television programs, such as Sesame Street, can improve cognitive, literacy, and social outcomes for children 3 to 5 years of age[11,12] and continue to create programming that addresses evolving child health and developmental needs (eg, obesity prevention, resilience). Evaluations of apps from Sesame Workshop and the Public Broadcasting Service (PBS) also have shown efficacy in teaching literacy skills to preschoolers.[2] Unfortunately, most apps parents find under the "educational" category in app stores have no such evidence of efficacy, target only rote academic skills, are not based on established curricula, and use little or no input from developmental specialists or educators.[2,13] Most apps also generally are not designed for a dual audience (ie, both parent and child).[2,14] It is important to emphasize to parents that the higher-order thinking skills and executive functions essential for school success, such as task persistence, impulse control, emotion regulation, and creative, flexible thinking, are best taught through unstructured and social (not digital) play,[15] as well as responsive parent–child interactions.[16]

Digital books (also called "eBooks," books that can be read on a screen) often come with interactive enhancements that, research suggests, may decrease child comprehension of content or parent dialogic reading interactions when visual effects are distracting.[17] Parents should, therefore, be instructed to interact with children during eBook reading, as they would a print book.

HEALTH AND DEVELOPMENTAL CONCERNS

Obesity

Heavy media use during preschool years is associated with small but significant increases in BMI,[18] may explain disparities in obesity risk in minority children,[19] and sets the stage for weight gain later in childhood.[20] Although many studies have used a 2-hour cutoff to examine obesity risk, a recent study of 2-year-olds found that BMI increased for every hour per week of media consumed.[21] It is believed that exposure to food advertising[22] and watching television while eating (which diminishes attention to satiety cues)[23] drives these associations.

Sleep

Increased duration of media exposure and the presence of a television, computer, or mobile device in the bedroom in early childhood have been associated with fewer minutes of sleep per night.[24]

Even infants exposed to screen media in the evening hours show significantly shorter night-time sleep duration than those with no evening screen exposure.[25] Mechanisms underlying this association include arousing content[26] and suppression of endogenous melatonin by blue light emitted from screens.[27]

Child Development

Population-based studies continue to show associations between excessive television viewing in early childhood and cognitive,[28–30] language,[31,32] and social/emotional delays,[33–36] likely secondary to decreases in parent–child interaction when the television is on[37] and poorer family functioning in households with high media use.[37] An earlier age of media use onset, greater cumulative hours of media use, and non-PBS content all are significant independent predictors of poor executive functioning in preschoolers.[38] Content is crucial: experimental evidence shows that switching from violent content to educational/prosocial content results in significant improvement in behavioral symptoms, particularly for low-income boys.[12] Notably, the quality of parenting can modify associations between media use and child development: one study found that inappropriate content

and inconsistent parenting had cumulative negative effects on low-income preschoolers' executive function, whereas warm parenting and educational content interacted to produce additive benefits.[39]

Child characteristics also may influence how much media children consume: excessive television viewing is more likely in infants and toddlers with a difficult temperament[40,41] or self-regulation problems,[42] and toddlers with social-emotional delays are more likely to be given a mobile device to calm them down.[43]

Parental Media Use

Parents' background television use distracts from parent–child interactions[44] and child play.[45] Heavy parent use of mobile devices is associated with fewer verbal and nonverbal interactions between parents and children[46] and may be associated with more parent-child conflict.[47] Because parent media use is a strong predictor of child media habits,[48] reducing parental media use and enhancing parent–child interactions may be an important area of behavior change.

CONCLUSIONS: CLINICAL IMPLICATIONS

In summary, multiple developmental and health concerns continue to exist for young children using all forms of digital media to excess. Evidence is sufficient to recommend time limitations on digital media use for children 2 to 5 years to no more than 1 hour per day to allow children ample time to engage in other activities important to their health and development and to establish media viewing habits associated with lower risk of obesity later in life.[49] In addition, encouraging parents to change to educational and prosocial content and engage with their children around technology will allow children to reap the most benefit from what they view.

As digital technologies become more ubiquitous, pediatric providers must guide parents not only on the duration and content of media their child uses, but also on (1) creating unplugged spaces and times in their homes, because devices can now be taken anywhere; (2) the ability of new technologies to be used in social and creative ways; and (3) the importance of not displacing sleep, exercise, play, reading aloud, and social interactions. Realistically, pediatric providers will need to know how to help parents find resources finding appropriate content, tools for monitoring or limiting child use, ideas for play or activities in which to engage rather than digital play, and how parents can limit their own media use (see HealthyChildren.org for examples); each of these can be built into the Family Media Use Plan (see the American Academy of Pediatrics guide to developing a plan at www.healthychildren.org/MediaUsePlan).

RECOMMENDATIONS

Pediatricians

- Start the conversation early. Ask parents of infants and young children about family media use, their children's use habits, and media use locations.
- Help families develop a Family Media Use Plan (www.healthychildren.org/MediaUsePlan) with specific guidelines for each child and parent.
- Educate parents about brain development in the early years and the importance of hands-on, unstructured, and social play to build language, cognitive, and social-emotional skills.
- For children younger than 18 months, discourage use of screen media other than video-chatting.
- For parents of children 18 to 24 months of age who want to introduce digital media, advise that they choose high-quality programming/apps and use them together with children, because this is how toddlers learn best. Letting children use media by themselves should be avoided.
- Guide parents to resources for finding quality products (eg, Common Sense Media, PBS Kids, Sesame Workshop).
- In children older than 2 years, limit media to 1 hour or less per day of high-quality programming. Recommend shared use between parent and child to promote enhanced learning, greater interaction, and limit setting.
- Recommend no screens during meals and for 1 hour before bedtime.
- Problem-solve with parents facing challenges, such as setting limits, finding alternate activities, and calming children.

Families

- Avoid digital media use (except video-chatting) in children younger than 18 to 24 months.
- For children ages 18 to 24 months of age, if you want to introduce digital media, choose high-quality programming and use media together with your child. Avoid solo media use in this age group.
- Do not feel pressured to introduce technology early; interfaces are so intuitive that children will figure them out quickly once they start using them at home or in school.
- For children 2 to 5 years of age, limit screen use to 1 hour per day of high-quality programming, coview with your children, help children understand what they are seeing, and help them apply what they learn to the world around them.

- Avoid fast-paced programs (young children do not understand them as well), apps with lots of distracting content, and any violent content.
- Turn off televisions and other devices when not in use.
- Avoid using media as the only way to calm your child. Although there are intermittent times (eg, medical procedures, airplane flights) when media is useful as a soothing strategy, there is concern that using media as strategy to calm could lead to problems with limit setting or the inability of children to develop their own emotion regulation. Ask your pediatrician for help if needed.
- Monitor children's media content and what apps are used or downloaded. Test apps before the child uses them, play together, and ask the child what he or she thinks about the app.
- Keep bedrooms, mealtimes, and parent–child playtimes screen free for children and parents. Parents can set a "do not disturb" option on their phones during these times.
- No screens 1 hour before bedtime, and remove devices from bedrooms before bed.
- Consult the American Academy of Pediatrics Family Media Use Plan, available at: www.healthychildren.org/MediaUsePlan.

Industry

- Work with developmental psychologists and educators to create design interfaces that are appropriate to child developmental abilities, that are not distracting, and that promote shared parent–child media use and application of skills to the real world. Cease making apps for children younger than 18 months until evidence of benefit is demonstrated.
- Formally and scientifically evaluate products before making educational claims.
- Make high-quality products accessible and affordable to low-income families and in multiple languages.
- Eliminate advertising and unhealthy messages on apps. Children at this age cannot differentiate between advertisements and factual information, and therefore, advertising to them is unethical.
- Help parents to set limits by stopping auto-advance of videos as the default setting. Develop systems embedded in devices that can help parents monitor and limit media use.

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ABBREVIATIONS

app: application
PBS: Public Broadcasting Service

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American Academy of Pediatrics:

2016 Technical Report

Children and Adolescents and Digital Media

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TECHNICAL REPORT

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Children and Adolescents and Digital Media

Yolanda (Linda) Reid Chassiakos, MD, FAAP, Jenny Radesky, MD, FAAP, Dimitri Christakis, MD, FAAP, Megan A. Moreno, MD, MSEd, MPH, FAAP, Corinn Cross, MD, FAAP, COUNCIL ON COMMUNICATIONS AND MEDIA

Today's children and adolescents are immersed in both traditional and new forms of digital media. Research on traditional media, such as television, has identified health concerns and negative outcomes that correlate with the duration and content of viewing. Over the past decade, the use of digital media, including interactive and social media, has grown, and research evidence suggests that these newer media offer both benefits and risks to the health of children and teenagers. Evidence-based benefits identified from the use of digital and social media include early learning, exposure to new ideas and knowledge, increased opportunities for social contact and support, and new opportunities to access health promotion messages and information. Risks of such media include negative health effects on sleep, attention, and learning; a higher incidence of obesity and depression; exposure to inaccurate, inappropriate, or unsafe content and contacts; and compromised privacy and confidentiality. This technical report reviews the literature regarding these opportunities and risks, framed around clinical questions, for children from birth to adulthood. To promote health and wellness in children and adolescents, it is important to maintain adequate physical activity, healthy nutrition, good sleep hygiene, and a nurturing social environment. A healthy Family Media Use Plan (www.healthychildren.org/MediaUsePlan) that is individualized for a specific child, teenager, or family can identify an appropriate balance between screen time/online time and other activities, set boundaries for accessing content, guide displays of personal information, encourage age-appropriate critical thinking and digital literacy, and support open family communication and implementation of consistent rules about media use.

INTRODUCTION

What Are the Differences Between Traditional Media and New Digital or Social Media?

Today's generation of children and adolescents are surrounded by and immersed in a digital environment. Traditional media, such as television

abstract

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(TV), radio, and periodicals, have been supplemented by new digital technologies that promote interactive and social engagement and allow children and teenagers instant access to entertainment, information, and knowledge; social contact; and marketing. Traditional media, also referred to as broadcast media, typically were created externally by an established production source, such as a film studio, TV network, or editorial staff and were provided either to individuals or to a broader audience for passive viewing or reading. In contrast, newer digital media, which include social and interactive media, are a form of media in which users can both consume and actively create content. Examples include applications (apps), multiplayer video games, YouTube videos, or video blogs (vlogs). For children and young adults today, this evolving integration of passively viewed and interactive media is seamless and natural; the distinctions and boundaries between traditional/broadcast and interactive/social media have become blurred or imperceptible.

Digital media allow information sharing across a variety of media formats, including text, photographs, video, and audio. Today's video games, for example, often represent a merging of both traditional and social media, as users can virtually "inhabit" impressively produced worlds and interact with other users in remote locations. Video game participants can even work collaboratively to cocreate virtual worlds. Thus, digital media can provide an engaging experience in which the media experiences of children and teenagers become highly personalized.

MEDIA USE ESTIMATES

How Are Media Usage Patterns Changing in Young Children?

The evolution of media from traditional to newer forms of digital media in the past decade has resulted in changes in the patterns of media use. For example, in 1970, children began to regularly watch TV at 4 years of age, whereas today, children begin interacting with digital media at 4 *months* of age.

As new media platforms and social media have been incorporated into children's media diets, hours spent in TV viewing have slowly decreased over the past 2 decades. Loprinzi and Davis[1] examined trends in parent-reported TV viewing among preschoolers 2 to 5 years of age (n = 5724) and children 6 to 11 years of age (n = 7104) between 2001 and 2012 using data from the National Health and Nutrition Examination Survey (NHANES), showing significant decreases in mean TV viewing over time, primarily for preschoolers and, to a lesser extent, for school-aged children. Non-Hispanic white boys demonstrated the largest decrease in mean viewing of 29%, from 2.24 hours of TV per day down to 1.59 hours of TV per day. Despite these decreases, the majority of parents still reported that their children watched TV for 2 or more hours per day.

It is unclear whether these decreases are in part the result of parents heeding expert recommendations to limit screen time (evidence would suggest not)[2] or whether they represent a displacement of TV viewing by the use of novel platforms. In young children, use of mobile devices, such as smartphones and tablet computers, has risen dramatically since the Kaiser Family Foundation first began surveying parents of 0- to 8-year-olds about their technology use.[3] For example, in 2011, 52% of children 0 to 8 years of age had access to a mobile device (although only 38% had ever used one). By 2013, this access had increased to 75% of 0- to 8-year-olds.[4] Although these national surveys continued to demonstrate a digital divide on the basis of economic status, with less access to mobile technology and the Internet in lower-income families, a smaller study in 2015 called this disparity into question by showing that almost all (96.6%) 0- to 4-year-olds recruited from a low-income pediatric clinic had used mobile devices, and 75% owned their own device.[5] This study also showed that most 2-year-olds used mobile devices on a daily basis and that most of the 1-year-olds assessed (92.2%) had already used a mobile device. Although a digital divide likely still exists in terms of access to quality content and reliable Wi-Fi, it is now clear that most young children seen by a pediatric health care provider will have used or have been exposed to mobile technology.

Exactly what young children are doing on mobile technology has not been studied in great detail, because mobile device usage is relatively recent and methodologically difficult to assess. By parent report, most children in the Kabali et al study[5] watched YouTube or Netflix primarily, and smaller proportions watched educational programs and played early-learning apps (eg, alphabet and counting apps). A large minority also played games or watched cartoons. Common Sense Media's Zero to Eight survey has found disparities in the use of educational media on mobile devices, with 54% of children from higher-income families often or sometimes using educational content on mobile devices but only 28% of children from lower-income families doing so.[4] Thus, younger children and those from lower-income families are more likely to use mobile devices for entertainment purposes.

How Are Media Being Used in Older Children and Teens Today? Which Modes of Use Are Most Popular?

Studies show that social media use patterns and rates among older

children and adolescents have continued to grow over the past decade, aided in part by the recent rise in mobile phone use among children and teenagers. At present, approximately three-quarters of teenagers own a smartphone, 24% of adolescents describe themselves as "constantly connected" to the Internet[6] and 50% report feeling "addicted" to their phones.[7] Mobile apps provide a breadth of specific functions, such as gaming, photo and video sharing, and global positioning system monitoring. Social media sites and their associated mobile apps provide a platform for users to create an online identity, communicate with others, and build a social network. Among the myriad accessible social networking sites, Facebook remains the most popular, with 71% of 13- to 17-year-olds surveyed by the Pew Research Center in 2014 and 2015 reporting using this site/app.[6] However, adolescents today do not typically dedicate themselves to just 1 site; most teenagers maintain a "social media portfolio" of several selected sites including, as indicated by rates of use in the Pew survey, Instagram (52%), Snapchat (41%), Twitter (33%), Google+ (33%), Vine (24%), Tumblr (14%), and other social media (11%).[6]

As communication moves from face-to-face and voice-only phone conversations to more screen-to-screen interactions via apps, such as FaceTime or Skype, daily communication is becoming intertwined with screen time. Texting, using a smartphone keyboard to send a written message or a visual symbol (emoji) to another smartphone, also has become a prominent means of communication for teenagers.

Lines are also becoming blurred between media use for communication versus for entertainment. With the ability to message your opponent while engaging in a remote video game or tweet while watching a TV show, viewers and gamers often link their entertainment to social media. Modes of communication have become more fluid, with conversations jumping back and forth between text messages to social media sites. Text messages also may include links to media, such as personal videos, YouTube videos, and links to Web sites and social networking sites.

Pew data from 2012 suggest that teenagers between 14 and 17 years of age sent a median of 100 texts a day. With all likelihood, this number will continue to increase as new data become available. Texting no longer is limited to cellular phone systems but can be facilitated by messaging apps, such as Kik or WhatsApp. Pew data from 2015 show that these apps are most popular with Latino (46%) and African-American (47%) teenagers, compared with white teenagers (24%).[6]

Video games also remain very popular among families; it is estimated that 4 out of 5 households own a device used to play video games, and approximately half of US homes own a dedicated game console.[8] Video games also are available via apps on mobile devices. Additionally, apps that have a practical function are also being marketed with a gaming perspective; this approach is known as "gamification."

It is common for adolescents today to engage in more than 1 form of media at the same time, a practice referred to as media multitasking. This multitasking may include watching TV and using a computer[9] or being online and engaging in more than 1 activity. In one study of older adolescents, approximately 50% of the time students were online, they were engaged in more than 1 activity.[10]

GAMIFICATION AND ADVERTISING

What Is Gamification? What Is the Impact of Gamification on Media Use by Children?

Gamification applies gaming elements to a real-world activity in a seamless, user-friendly, and attractive way. Commercial video games have incorporated cutting-edge graphics, behavioral reinforcers (ie, for reaching certain levels of play), and exciting stories, which have been delivered through stationary personal computers, dedicated gaming consoles, or multiplayer networks. One key difference today is the portability achieved via smartphones, mobile Wi-Fi, and broad social networks, which has changed how and where games can be played and how gaming functions can be applied. These portable "games" can now be integrated into daily life by functioning as sources for information and guidance and by providing motivation to achieve academic and wellness goals. For example, the Nike+ app tracks exercisers' routes, pace, steps, distance, and time and challenges runners to compete with friends and improve their performance. Such design also serves to reinforce behavior (both health behaviors and for using the app), resulting in more engagement with both.[11]

How Have Mobile and Social Media Changed the Ability of Advertisers to Reach Children and Teenagers?

Newer media have provided expanding opportunities for marketers and advertisers to adapt their messages to reach millions of children and teenagers.[12] These newer forms of media may broaden the types of products and behaviors to which children and adolescents are exposed. For example, although restrictions may exist to limit exposure to advertisements for alcohol in traditional media, research

suggests that the major alcohol brands maintain a strong presence on Facebook, Twitter, and YouTube.[13,14] From a marketing perspective, social media are consumer focused, allowing interaction and input that can build relationships.[15] Social media also allow targeted ads that reflect content that users have posted on their own pages. In one study, researchers found that placing content related to exercise or nutrition as a status update on Facebook led to advertisements for sports gear and diets as well as junk food.[15] Thus, social media ads can directly address individuals or groups who would be interested and responsive. Social media ads may also be interactive and are more affordable to create and disseminate. However, this ability for marketers to reach children through social media is understudied.

Marketing to parents of young children also is common, because advertisers know that many parents fear that their children may fall behind in the skilled use of technology without early exposure to it.[16] In reality, parents can be reassured that their children will learn to use digital media quickly when they are introduced at home or in school.

BENEFITS AND OPPORTUNITIES OF MEDIA USE

Fortunately, new media use is not without its benefits, but these benefits largely depend on a child's age and developmental stage, a child's characteristics, how the media are used (eg, with a parent or without), and the media content and design.

Early Childhood

At What Age Can Infants and Toddlers Learn From Screens?

Evidence continues to show limited educational benefits of media for children younger than 2 years. Earlier American Academy of Pediatrics (AAP) recommendations to discourage media exposure for children younger than 2 years were based on research on TV and videos, which showed that in-person interactions with parents are much more effective than video for learning of new verbal or nonverbal problem-solving skills.[17] This research showed that infants and toddlers experience what was referred to as the "video deficit:" difficulty learning from 2-dimensional video representations at younger than 30 months of age. The video deficit is thought to be attributable to infants' and young toddlers' lack of symbolic thinking, immature attentional controls, and the memory flexibility required to effectively transfer knowledge from a 2-dimensional platform to a 3-dimensional world.[18] Before 2 years of age, children are still developing cognitive, language, sensorimotor, and social-emotional skills, which require hands-on exploration and social interaction with trusted caregivers for successful maturation.

Therefore, adult interaction remains crucial for toddlers to learn effectively from digital media. For example, from 12 to 24 months of age, toddlers can begin to learn novel words from commercially available "word learning" videos, but only if their parents watch with them and reteach the words, essentially using the videos as a learning scaffold to build the language skills.[19,20] In one longitudinal study of low-income families, 14-month-olds whose mothers had talked with them during educational TV programming since infancy showed more advanced language development than infants whose mothers did not talk with them during media use (although this finding also may have reflected how much mothers spoke to children in general).[21] The few experimental studies showing independent learning of words from videos at this age have been limited by their low ecologic validity[22] or have shown that toddlers lose the knowledge learned over time without repetition.[23]

More recent research has shown that, under particular conditions, children between 15 and 24 months of age can learn from repeated viewing of video demonstrations without adult help. Dayanim and Namy showed that 15-month-olds could learn the meaning of sign language symbols after 3 weeks of watching a commercially available video 4 times per week.[24] However, children in a comparison study group whose parents used a book of sign language symbols to teach the content retained more knowledge about the symbols' meanings for a longer period of time.

Building parasocial relationships with TV or video characters (ie, the perceived relationship that audience members develop with characters who speak to them, such as Elmo or Dora) also has been shown to improve toddlers' learning. Calvert et al[25] showed that, after 3 months of playing with a personalized interactive toy, 21-month-olds could learn how to stack cups from a video demonstration by the same character, suggesting that building an emotional bond with an on-screen character improves learning potential. However, a primary limitation of such experimental studies is that they do not examine how repeated media use displaces other activities, and they do not examine longer-term outcomes. For example, in the study by Calvert and colleagues,[25] children randomly assigned to the group that did not receive the interactive toy for 3 months actually scored better in terms of language development at 21 months of age.

Are Touchscreens More Educational?

Pedagogic theory has long emphasized that interaction improves learning. This understanding has been the motivation for recommending coviewing of media, along with evidence that

parent interaction increases young children's engagement with media and understanding of content.[26] The interactivity of new media via touchscreens allows apps to "know" whether a child is responding accurately and tailor responses, reinforcement, and next steps to the child's input. Theoretically, this may increase educational potential by providing scaffolding to build skills at the child's edge of competence.

Empirical evidence regarding interactive media use in infants and toddlers is sparse. At 24 months of age, a child can learn words from live video-chatting with a responsive adult[27] or from carefully designed, interactive screen interfaces that prompt the child to tap on relevant learning items.[28] Starting at 15 months of age, toddlers can learn novel words from touchscreens in laboratory-based studies (with specially designed, not commercial, apps) but have trouble transferring this knowledge to the 3-dimensional world,[29] particularly if they regularly use touchscreen platforms to view entertainment media.

Is Skyping Appropriate for Infants and Toddlers?

Many parents now use video-chat (eg, Skype, Facetime) as an interactive media form that facilitates social connection with distant relatives. New evidence shows that infants and toddlers regularly engage in video-chatting,[30] but the same principles regarding need for parental support would apply in order for infants and toddlers to understand what they are seeing. Because video-chat episodes usually are brief,[30] promote social connection, and involve support from adults, this practice should not be discouraged in infants and toddlers.

What Is the Best Approach to Selecting Quality Content for Young Children?

High-quality TV programs (eg, Public Broadcasting Service [PBS] programs, such as *Sesame Street* and *Mister Rogers' Neighborhood*) can demonstrably improve cognitive, linguistic, and social outcomes for children 3 to 5 years of age. Although there have been few large community-based, randomized trials, many observational studies and some small experimental ones have demonstrated that preschoolers can learn literacy, numeracy, and prosocial skills from high-quality TV programs.[31,32] In addition, Sesame Workshop and other child content creators have been responding to current child health and developmental needs (eg, obesity, resilience) by crafting programming aimed at teaching parents and children relevant knowledge and skills.

Choosing PBS content has been found to be protective of poor executive function outcomes observed in children who start consuming media in early infancy.[33] Preschoolers randomly assigned to change from inappropriate or violent content to high-quality prosocial programming were found to have significant improvements in their externalizing and internalizing behavior,[32] which also speaks to the importance of content. For families who find it difficult to modify the overall amount of media use in their homes, changing to high-quality content may be a more actionable alternative; to make these changes, pediatric providers can direct them toward curation services, such as Common Sense Media, for reviews of videos, apps, TV shows, and movies.

Are "Educational" Apps and e-Books Really Educational?

As content from PBS high-quality programs is translated into apps and game formats (eg, *Martha Speaks*, *Big Bird's Words*, and *Cookie Monster's Challenge* apps), educational benefits have been shown in preschoolers.[34] Unfortunately, very few of the commercially available apps found in the educational section of app stores have evidence-based design input with demonstrated learning effectiveness. In fact, recent reviews of hundreds of toddler/preschooler apps labeled as educational have demonstrated that most apps show low educational potential, target only rote academic skills (eg, ABCs, colors), are not based on established curricula, and include almost no input from developmental specialists or educators.[35,36] An additional concern is that the formal features (ie, bells and whistles) that are designed to engage the child in an interactive experience may actually decrease the child's comprehension or distract from social interaction between caregivers and children during use, as has been shown for e-books,[37] which is important, because active parent involvement in both digital play and book reading improves children's learning from the experience.[38,39]

One reason that children may be less socially engaged during digital play is that gaming design involves behavioral reinforcement meant to achieve a maximum duration of engagement, which may explain why interrupting children's digital play leads to tantrums, particularly when games or videos are set on autoadvance.[40] To address these concerns, academic and industry leaders have recently recommended creating digital products for children that are appropriately engaging, but not distracting; that are designed to be used by a dual audience (ie, both parent and child) to facilitate family participation in media use and modeling of more effective social and learning interactions[35,41]; and that have automatic "stops" as the default design to encourage children and caregivers to pause the game use and turn to the 3-dimensional world.[40]

One recent app, for example, demonstrates such an adult–child dyad-centered design. Bedtime Math creates a platform and a structure for

parents and children to read stories and answer math problems together on a nightly basis. It is one of the few apps that has been tested in a randomized controlled community-based trial and shown benefits.[42] Embedding, indeed requiring, social interactivity for functionality may hold great promise for even younger children as well. However, recent population-based surveys suggest that joint media engagement[43] (and designs to facilitate it)[35] is not as common as individual use.

School-Aged Children and Teenagers

How Can Media Use in Older Children and Teenagers Increase Collaboration and Tolerance?

Research studies as well as anecdotal reports have suggested benefits of media use for today's children and adolescents, such as communication and engagement.[44] Additional benefits include exposure to new ideas and immersive learning experiences. Many social media platforms provide tools that students can use to touch base with and collaborate with others on projects. Communicating across distance is made easier by social media; these communications may include connecting via video-chatting with family or friends who are separated geographically. Traditional and social media can also raise awareness of current events and issues, and social media can provide tools to promote community participation and civic engagement.

A study by Kidd and Castano[45] indicated that reading literary fiction improves empathy in children. Although books are a traditional form of media, the study indicates that exposure to character-focused media can break stereotypes and help children understand people from whom they differ. Internet usage/digital media consumption is positioned to have a similar impact, which is important to help children learn about, understand, and empathize with marginalized groups.

How Can Social Media Be Used To Promote Improved Health?

Health benefits of social media may include enhanced access to valuable support networks. These networks may be particularly helpful for patients with ongoing illnesses, conditions, or disabilities[46] as well as for those identifying as lesbian, gay, bisexual, transgender, questioning, or intersex (LGBTQI) seeking helpful information or a welcoming community. Recent literature indicates that transgender teenagers who feel supported by their families have lower rates of depression and anxiety.[47] Connections with a supportive online community (eg, the "It Gets Better" project) may be beneficial to teenagers who identify as LGBTQI, but most such programs have not been studied to determine effects and outcomes.

Research also supports the use of social media to foster social inclusion or peer-to-peer connection among patients who might otherwise feel excluded, for example, patients with obesity[48] or mental illness.[13] Individuals with mental illness report greater social connectedness and feelings of group belonging when using social media in this manner, because they foster the ability to share personal stories and strategies for coping with challenges.[14] The advantages of these connections include avoiding feared stigma, enhancing social networks, learning about resources from peers online, and gaining information and insight. However, risks of such interactions can include exposure to misinformation, negativity or hostility in communications, delays in seeking out traditional resources, and unhealthy influences.

Young adults describe the benefits of seeking health information online and through social media and recognize these channels as useful supplementary sources of information to health care visits.[15] Social media may be used to enhance health and wellness and promote healthier behaviors, such as smoking cessation and balanced nutrition.[44] However, there are a myriad of easily accessible Web sites and social networks that facilitate and even promote unhealthy behaviors, such as disordered eating. "Pro-ana" (anorexia nervosa) and "pro-mia (bulimia)" sites, for example, are forums in which peers actively support restricted eating or purging and frequently offer life-threatening suggestions and advice.[49]

Do Screen Time Limits Apply for Children With Disabilities Who Use Mobile Devices To Communicate?

An important benefit from new media has been the development and use of technology-aided interventions in children and adolescents with disabilities, particularly through the expanding use of assistive and interactive digital media to learn and to communicate in youth with autism spectrum disorder (ASD),[50] physical disabilities, speech impairment, and intellectual disability to learn and communicate.[51] However, because teenagers with ASD have higher rates of problematic media use,[52,53] limits still should be placed on entertainment media use, such as watching videos or playing gaming apps, which can represent a restricted interest in children with ASD.

HEALTH AND DEVELOPMENTAL RISKS OF MEDIA USE

What Are the Developmental and Behavioral Risks in Early Childhood?

Population-based studies continue to show associations between excessive TV viewing in early childhood and cognitive,[54–56] language,[57,58] and social/emotional delays.[59–62] Possible mechanisms for these outcomes include the effects of viewing inappropriate, adult-oriented content[54] (as well as

some inappropriate child-directed content),[58] a decrease in parent–child interaction when the TV is on,[63] and poorer family functioning in households with high media use.[60]

An earlier age of media use onset, greater cumulative hours of media use, and content that is not of high quality all are significant independent predictors of poor executive functioning (impulse control, self-regulation, mental flexibility)[33] as well as "theory of mind" deficits (ie, the ability to understand others' thoughts and feelings) in preschoolers.[64] Media multitasking, once thought to be a pastime only of only adolescents, now is observed even in children younger than 4 years.[13] The orienting response to novel stimuli is very strong in young children, so their attention is drawn to the engaging and quickly changing features of digital media, such as animation, sounds, and highlighted features they can tap and swipe.[65] These features, however, may decrease young children's comprehension.[66] It is unknown whether rapid shifts in attention to and from digital stimuli may have long-term effects on children's attention span or information processing.

Because strong associations between violent media content and child aggressive behavior have been clearly documented,[67] parents should continue to monitor the content of their children's media. Today, more children own and use mobile devices independently,[13] making monitoring and regulation much more difficult.[16,68] More research is needed on how parents can best supervise and guide their children's media use.

Are Certain Children or Families More Susceptible to These Risks?

TV has been used as an "electronic babysitter" for decades, but recent evidence suggests that excessive media use is more likely in infants and toddlers with a "difficult" temperament[69,70] or self-regulation problems.[71] Toddlers with social-emotional delays are more likely to be given a mobile device to calm them down,[72] especially if their parents are facing parenting control challenges. However, it is not clear whether more "difficult" infants and toddlers have more positive or negative outcomes over time when exposed to longer media duration, which likely depends on content quality and other contextual factors. For example, Linebarger et al[73] found that the quality of parenting can modify associations between media use and child development: inappropriate content and inconsistent parenting had cumulative negative effects on low-income preschoolers' executive function, and warm parenting and educational content interacted to produce additive benefits.

Is Media Use Linked to Obesity?

High levels of media use are linked to obesity and cardiovascular risk[74] throughout the life course, but these associations are observed starting in early childhood. For example, heavy media use during preschool years is associated with small but significant increases in BMI,[75] which sets the stage for greater weight gain later in childhood. The association between using ≥2 hours of media per day and obesity persists even after adjusting for children's psychosocial risk factors or behavioral problems.[76] Research in preschoolers often uses a 2-hour cutoff to define excessive media use, but a recent study of 2-year-olds found that BMI increased for **every hour per week** of media consumed.[77] Moreover, media use behaviors may explain some of the obesity risk disparities among young black and Hispanic children.[78] None of these studies examined mobile media specifically, which may be more easily used during meals and, therefore, distract children from satiety cues.[79]

Studies of older children and teenagers show clear correlations between increases in hours of TV viewing and higher risk of obesity.[80] In a 1996 study of 5- to 10-year-olds, the odds of being overweight were 4.6 times greater for youth watching more than 5 hours of TV per day compared with those watching 0 to 2 hours.[81] This study greatly influenced the AAP recommendations for 2 hours or less of sedentary screen time daily for children 2 through 18 years of age. However, a more recent study in the Netherlands of children 4 through 13 years of age found that watching TV **over 1.5 hours per day** was a significant risk factor for obesity. In this study, however, an association between TV and obesity was only found for children 4 through 9 years of age.[82] A large international study with almost 300 000 children and adolescents found that watching **between 1 and 3 hours of TV a day** led to a 10% to 27% increase in risk of obesity.[83] These more recent studies suggest that setting limits of TV viewing to between **1 and 1.5 hours a day** may be more effective to prevent obesity than the 2 hours per day standard presented in earlier AAP recommendations.

Additional studies have identified relevant factors around TV viewing beyond solely the number of hours for families to use in developing household rules. Another recent study found that the association between TV viewing and obesity risk was only significant for children who were already at the higher end of the BMI distribution.[84] A large study using a national dataset of children reported that it was not just the hours of TV viewing that predicted obesity, but the combination of low physical activity and high sedentary TV viewing that was most contributory to obesity risk.[85] A 2008 study directly examined the AAP recommendations for 2 hours a day or less of sedentary media

consumption and found that **boys who exceeded 2 hours a day of sedentary media use** were 1.7 times more likely to be overweight compared with those who had 2 hours a day or less of sedentary media use. The results for girls were much less impressive, in that girls with over 2 hours a day of sedentary media use were only 1.2 times more likely to be overweight compared with girls who had 2 hours or less of media use time.[86]

The association between TV viewing and obesity previously attributed to food advertising[87] may now be decreased, because children watch more videos from streaming services (eg, Netflix, Hulu), which do not contain advertisements, but this has yet to be studied.

Another area of obesity risk is the presence of a TV in the bedroom. A 2007 study found that having a TV in the bedroom was an independent risk factor for obesity. A more recent study found that the combination of a TV in the bedroom and greater use of screen time had the strongest association with obesity.[88]

Fortunately, studies also suggest that making efforts to reduce children's sedentary media use can have positive health effects. An intervention study focused on third and fourth graders worked with the participants to reduce time spent watching TV and playing video games. The study demonstrated that children in the intervention group reported reduced TV viewing and meals in front of the TV and had reduced BMIs, illustrating that interventions to reduce sedentary media use can positively impact health behaviors as well as BMI.[89]

How Does Media Use Affect Sleep?

There is a growing body of evidence that suggests that media use negatively affects sleep.[90] Increased duration of media exposure and the presence of a TV, computer, or mobile device in the bedroom in early childhood have been associated with fewer minutes of sleep per night, especially among children of racial/ethnic minority groups.[91] Later bedtimes after evening media use and violent content in the media also may be contributing factors,[92] and suppression of endogenous melatonin by blue light emitted from screens is another possible cause.[93] Associations between media and sleep are seen in infants as well; 6- to 12-month-olds who were exposed to screen media in the evening hours showed significantly shorter night-time sleep duration than those who had no evening screen exposure.[94]

Studies of older children and teenagers have found that participants with higher social media use[95] or who sleep with mobile devices in their room[96,97] were at greater risk for sleep disturbances. One study of adults found that taking a phone into the bedroom led to longer sleep latency, worse sleep quality, more sleep disturbance, and more daytime dysfunction.[98] This study illustrates the multiple mechanisms by which media use around bedtime, or during bedtime, can disrupt sleep and affect daytime function.

Bruni et al[90] studied the use of technology on sleep quality in adolescents and preadolescents. Adolescents' bad sleep quality was associated consistently with greater mobile phone use and the number of devices in the bedroom, and in preadolescents, bad sleep quality was associated with greater Internet use and later media turn-off time. The authors concluded that evening circadian preference, mobile phone and Internet use, the number of other activities engaged in after 9:00 PM, later media turning-off time, and the number of devices in the bedroom have different, but significant, negative influences on sleep quality in preadolescents and adolescents.[90] Similarly, Lemola et al[99] reported associations between electronic media use in bed before sleep, sleep difficulties, and symptoms of depression in teenagers.

Daytime screen use may also affect sleep. According to a Norwegian study, daytime and bedtime use of electronic devices *both* affected sleep measures, with an increased risk of short sleep duration, long sleep onset latency, and increased sleep deficiency. A dose–response relationship emerged between sleep duration and use of electronic devices.[100] Ensuring that children and teenagers obtain the necessary hours of healthy sleep is an important goal of a Family Media Use Plan (www.healthychildren.org/MediaUsePlan).

What Are the Risks of Social Media Use In School-Aged Children and Teenagers?

The links between media and health behaviors among adolescents have been backed by decades of evidence in traditional media.[101–104] Studies have shown that exposure to alcohol or tobacco use or risky sexual behaviors in TV or movies is associated with initiation of these behaviors,[101,102,105,106] leading some to describe TV as a "superpeer."[107] A growing body of evidence suggests that these influences also are strong in digital and social media. Several studies have illustrated that adolescents' displays on social media frequently include portrayal of risky health behaviors, such as illegal alcohol use or overuse, illicit substance use, high-risk sexual behaviors, and harmful behaviors, such as self-injury and disordered eating.[108–112] A growing body of evidence suggests that peer viewers of this content are influenced to see these behaviors as normative and desirable.[113–115] Social media combine the power of interpersonal persuasion with the reach of mass media. Fogg described this mass interpersonal persuasion as

"the most significant advance in persuasion since radio was invented in the 1890s."[116]

Although restrictions exist to protect youth and children from exposure to alcohol, tobacco, and marijuana advertisements on traditional media platforms, such as TV, there is concern about the extent to which youth are exposed to promotion of these substances on social media Web sites from marketers or peers. For example, research from both the United States and the United Kingdom indicate that the major alcohol brands maintain a strong advertising presence on Facebook, Twitter, and YouTube.[13,14] Targeted advertising via social media may have a significant effect on adolescent behavior.

How Does Media Use in School-Aged Children and Teenagers Relate to Mental Health?

Research studies have identified both benefits and concerns regarding mental health and media use. In one longitudinal panel survey, 396 white and black preadolescent boys and girls were assessed to determine the long-term effects of TV consumption on global self-esteem. TV exposure was found to be significantly related to self-esteem, but whether it increased or decreased self-esteem was influenced by demographic factors. Greater exposure resulted in a decrease in self-esteem for both white and black girls and for black boys but resulted in an increase in self-esteem for white boys.[117] Analyzing these results, the authors postulate that the majority of the TV content served to reinforce both gender-role and racial stereotypes, which tended to be positive for white boys but not the other groups. The authors suggested that the black children and white girls could be internalizing the "social norms" portrayed and using these messages as a basis for self-evaluation, negatively affecting their self-esteem. There is also an opportunity cost when more TV viewing displaces real-life experiences that might build self-esteem.

The interactive and selective components of social media may offset some of these traditional media drawbacks, because social media use in moderation can enhance social support and connection. However, use in moderation and the specific way in which social media are used may be the key. Previous research has suggested a U-shaped relationship between Internet use and depression, with increased risks for depression at both the high and low ends of Internet use.[118,119] A recent study examined social media use and depression and found a positive association.[120] Older adolescents who used social media passively by solely viewing content reported declines in well-being and life satisfaction, whereas those who used social media actively by interacting with others and posting content did not experience these declines.[121] Another study found that teenagers who used Instagram to follow strangers and engage in social comparisons had higher depression symptoms, but others who followed friends and engaged in less social comparison had fewer depression symptoms.[122] These studies illustrate that, beyond the number of hours spent on social media, a key factor is how an individual uses social media.

Do Children and Adolescents Understand the Privacy Risks Associated With Social Media Use?

An important issue across all social media and interactive apps is privacy, because content that a child or adolescent chooses to post on any site or app becomes public in some way. Removal of such content may be difficult or impossible. Previous work suggests that adolescents vary in their understanding of privacy practices, and even among those who do know how to set privacy settings, many choose not to do so.[123–125] Despite efforts by some social media sites to protect privacy or even to delete content after it is viewed, privacy violations and content sharing are always possible.[126,127] This risk illustrates the need for continued discussion about media and privacy with children and teenagers with parents, caregivers, teachers, and other responsible adults. These discussions should be included in schools through their digital citizenship programs and in pediatric well-child examinations with parents and teenagers. Pediatricians can introduce and work with families to develop a Family Media Use Plan (see the AAP guide to making a plan at www.healthychildren.org/MediaUsePlan) that can mitigate or avoid such risks.

Is Cyberbullying Different From Traditional Bullying?

Cyberbullying is commonly defined as "an aggressive, intentional act or behavior that is carried out by a group or an individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend him or herself."[128] Unfortunately, there are many online platforms in which bullying may take place, including E-mail, blogs, social networking Web sites/apps, online games, and text messaging. There is clear overlap between cyberbullying and traditional bullying,[129] but several features of online bullying present new challenges. These challenges include that perpetrators can bully at any time of day and can be anonymous, the rapidity with which information can spread online,[130] and the fluidity with which bully and target roles can switch in the online world. Estimates of the number of youth who experience cyberbullying vary, ranging from 10% to 40%, depending on the age group and how cyberbullying is defined.

Cyberbullying shares many similarities and a few key differences

with traditional bullying. For example, victims of cyberbullying often do not know who the bully is or why they are being targeted, the hurtful actions of a cyberbully can reach a child or teenager anytime he or she uses a smartphone or computer (so there is no safe haven of home), and the bullying messages can also spread virally through the Internet to many other people at school or in the community, making this type of bullying potentially very embarrassing and lasting.

Descriptive research has shown that vulnerable populations exist and are more likely to be targeted for bullying. Youths identifying as LGBTQI are more likely to be victimized in bullying dynamics and are at risk online as well.[131] Children and adolescents with ASD are a population particularly vulnerable to bullying (https://www.autismspeaks.org/family-services/bullying) and could easily be a target for cyberbullying. The 2016 National Academies of Sciences, Engineering, and Medicine report, "Preventing Bullying Through Science, Policy, and Practice,"[132] addressed the concept of populations vulnerable to bullying to propose that there is a need for research that moves beyond descriptive studies and labeling of youth as vulnerable and considers processes that can explain why individuals may have differences in their bullying experiences and consequences depending on their context.

Previous studies have examined the negative effects that cyberbullying can have on both bullies and victims. Victims are more likely to report lower grades and other academic problems as a result of the experience. Similar to traditional bullying, cyberbullying can lead to short- and long-term[133,134] negative social, academic, and health[134–137] consequences for both the perpetrator and target. Both bullies and victims often report higher levels of depression and lower self-esteem. Victims were at higher risk of both suicidal ideation and suicide attempts.

Fortunately, newer studies suggest that interventions targeting bullying also may reduce cyberbullying.[138] Moreno states: "Parents can play a role in preventing cyberbullying by educating their children about appropriate online behaviors. Parents should have discussions early and often about their child's friendships and relationships to develop and maintain open communication about these topics."[139] The Centers for Disease Control and Prevention panel reviewing effective prevention strategies recommends media literacy education as a "promising approach," along with collaborative strategies among teenagers, parents, and schools that encourage victims to report cyberbullying and seek adult support.[140]

What Is Sexting and How Can the Risks of Sexting Be Avoided or Addressed?

Sexting is a serious issue in adolescence. Sexting is commonly defined as the electronic transmission of nude or seminude images as well as sexually explicit text messages.[111] It is estimated that approximately 12% of youth 10 to 19 years of age have ever sent a sexual photo to someone else[112]; sadly, many youth who have participated in sexting report having felt pressured into sending a sext. When dealing with youth and sexting, adults, authorities, and schools need to be aware that the situation may be more complicated.

Spencer et al[141] examined sexting and youth in an urban population; 55 youth presenting for care at the Teen Health Center at Children's Hospital Los Angeles were surveyed to evaluate prevalence and sexting behaviors, such as forwarding sexts, reasons for sending sexts, and youths' concerns regarding sexting. Of those surveyed, 48.5% of girls and 63.6% of boys had sent a sext, and 70% of girls and 82% of boys had received a sext. The authors report that girls expressed significantly more concern than boys about how sexting could affect their reputation, including getting caught by an adult with a sext and how others would think of them. Fortunately, 52% of respondents said they would be comfortable talking with their doctor about sexting. Pediatricians may, therefore, find their teen patients receptive to a conversation about sexting and its implications and risks.

Ybarra and Mitchell, in their article, "'Sexting' and its relation to sexual activity and sexual risk behavior in a national survey of adolescents,"[142] suggest that sexting is related to behaviors indicative of psychosocial challenge and risky sexual behavior for some youth. Significant findings include a higher frequency of sexting among females and lesbian, gay, and bisexual youth. Additionally, a greater number of past-year sex partners and a greater odds of depression and substance abuse were found among teenagers who sext.

Findings related to lesbian, gay, and bisexual populations are consistent with previous studies on sexting; of note, transgender youth were not included. Earlier research had demonstrated a significant association between sexting and risky sexual behaviors in lesbian, gay, bisexual, and transgender youth.[142]

Ybarra and Mitchell's study[142] found that sexting was indicative of sexual activity and risky sexual behaviors, and further research may identify predictive outcomes of sexting. One study suggests that sexting may precede sexual intercourse.[142] The predictive value of a sexting history may inform sex education and HEEADSSS (**h**ome, **e**ducation & **e**mployment, **e**ating, **a**ctivities, **d**rugs, **s**exuality, **s**uicide/depression,

and safety) assessments. Moreover, discussions between pediatricians and teenagers about sexting may indicate risky sexual behaviors and a number of psychosocial issues, such as depression, anxiety, and low self-esteem, that may be further addressed.

Temple et al[143] examined whether adolescents who report sexting exhibited more psychosocial health problems than their nonsexting counterparts. The authors reported that teen sexting was significantly associated with symptoms of depression, impulsivity, and substance use. When adjusted for previous sexual behavior, age, gender, race/ethnicity, and parent education, however, sexting was only related to impulsivity and substance use. The authors concluded that "while teen sexting appears to correlate with impulsive and high-risk behaviors (substance use), we did not find sexting to be a marker of mental health."[143]

Sexting is a behavior that will likely continue and expand with technologic advances that make photography and communication more accessible. Active debate continues regarding the ethical and legal components of sexting, especially among underage youth. Concerns include the identification of sexts as pornography or sexual misconduct. Even consensual, noncoercive sexting may result in criminal prosecution that may lead to long-term legal consequences.

Addressing risky sexual behaviors and psychological symptoms associated with sexting through education and guidance should help to promote wellness and responsibility within adolescent populations. Further research evaluating sexting among gender minority populations (eg, transgender adolescents) also will be valuable in understanding and discouraging the behavior and providing safer and less risky alternatives for social connections.

CHILD PORNOGRAPHY AND CHILD ABUSE

How Has Social Media Changed the Landscape of Child Pornography and Child Abuse?

Unfortunately, the Internet has also created opportunities for the exploitation of children by sex offenders. Online predators can gain access to children and teenagers through social networking, chat rooms, E-mail, and online games. Cases of child trafficking, cybergrooming, and sexual abuse for private and commercial purposes have increased with the help of the anonymous cyberspace environment. For example, online grooming leads to establishment of a trusting relationship, often with the perpetrator misrepresenting himself as another child or teenager. This developing online relationship may lead to sexting or to convincing the child to meet the perpetrator in person. Children may be deceived, tricked, or coerced into engaging in sexual acts for the production of child sexual abuse materials (child pornography), which then can circulate online for years to come. Child sexual abuse images often involve young and very young children. Of 43 597 children assessed in sexual abuse images and videos, 49.6% appeared to have a sexual maturity rating of 1, and 28.7% appeared to have a sexual maturity rating of 2.[144] Besides the adverse effects associated with child sexual abuse,[145,146] victims who have had online sexual images (pornography and sexting) posted may experience significant anxiety and stress related to knowledge that the abuse images may be downloaded and viewed by millions of people for an indefinite period of time. Thus, the exploitation continues for months and years after the images were obtained.[144]

Online child sexual exploitation also may involve recruitment and advertisement of children for prostitution and other forms of exploitation.[147] The Internet may be used by human traffickers to facilitate movement of victims and to manage a criminal network.[148]

Internet-initiated sex crimes involving offenders who meet and groom children online tend to involve adolescents rather than very young children: 99% of victims in one study were 13 to 17 years old, and 48% were 13 to 14 years old. Many of these crimes involve face-to-face sexual contact, which the victim perceives as "consensual." Sexual relationships in early adolescence are associated with an increased risk of social, academic, and behavioral adverse outcomes.[149,150]

Research has shown that parents underestimate the likelihood that their child might engage in online conversation with people they do not know. Therefore, it is critical that parents promote online safety with their children from an early age, monitor children's Internet use, and use tools, such as parental control software, to maintain awareness of their child's online activities.[151] Pediatricians should consider asking appropriate questions to explore this possibility and to educate youth about protecting themselves from exploitation. All health care professionals should report any suspicions of sexual abuse/exploitation as per child abuse reporting laws.

USE OF MEDIA BY PARENTS AND CAREGIVERS

What Effect Does Parent Media Use Have on Young and School-Aged Children and Teenagers?

Parents and caregivers play an important role in modeling optimal behaviors for their children in general, including when it comes to

the consumption and use of media. The growth of digital and social media, particularly in the last 5 years, has seen dramatic increases in adults' use of social media as well as use by children and teenagers; more than 70% of adults now use social media[152] and 27% report feeling "addicted" to their mobile devices.[7] Social media can provide positive social experiences for adults, such as opportunities for parents to connect with their child in a college dorm via video-chatting services. Such services also can promote social and emotional connection among distant relatives or deployed parents and children. However, some parents can, themselves, overuse digital media. For example, research has shown that parents' own TV viewing distracts from parent–child interactions[153] and children's play.[154] Children younger than 2 years are more likely to be exposed to and watch inappropriate "background" media (eg, TV) than older children.[155] Heavy parent use of mobile devices is associated with fewer verbal and nonverbal interactions between parents and children[156] and may be associated with more parent–child conflict.[157]

Because parent media use is a strong predictor of child media habits,[158] reducing parental TV viewing, including "background" TV, and enhancing parent–child interactions may be an important area of behavior change that pediatricians can help to facilitate. Because parent–child interactions during family routines are an important opportunity for emotional connection, have been shown to be protective of child health outcomes, such as asthma and high-risk behavior,[159] and are the primary driver of early childhood development of language, cognition, social skills, and emotion regulation, it is important to preserve them. Parents often report feeling that technology speeds up their lives and work demands[160] and that it is difficult to multitask between technology and childrearing, so pediatric providers can support their efforts to create boundaries and "unplugged" zones in their households.

THE FAMILY MEDIA USE PLAN

- How can pediatric health care providers help families use media in healthy ways?
- What is the AAP Family Media Use Plan?

Pediatricians and other pediatric health care professionals can be helpful resources for families seeking specific advice about how to develop and individualize family rules and guidelines to meet their distinct needs. Unfortunately, only 16% of pediatricians ask families about their media use. In addition, only 29% of parents report relying on their pediatrician for advice about broadcast and social media, although those who do tend to follow AAP recommendations.[161]

When discussing media use with families, pediatric health care providers can print out and help families begin completing the AAP Family Media Use Plan (www.healthychildren.org/MediaUsePlan). Providers can discuss with parents and developmentally ready children how each of the media-specific behaviors and health concerns can be addressed through practical, family-centered approaches. The Family Media Use Plan can act as a teaching tool through which pediatricians can provide information about the benefits and health risks of both traditional and new media. The potential risks of interactive media, such as reduced physical activity, inadequate sleep, and unhealthy influences like cyberbullying and weight bias, are important to discuss with families as well.

The plan also can be a tool through which the pediatrician can explore and understand each family's values and health goals—for example, how good nutrition, an active lifestyle, good sleep hygiene, parent–child emotional connection, and creative play fit into the family's typical day—and identify areas in which good health and wellness can be enhanced. Pediatricians can suggest ways in which media can be used to connect, learn, and create instead of simply consume.

These discussions can also allow pediatric health care providers to consider screening for problematic Internet use and Internet gaming disorder using validated tools, such as the Internet Gaming Disorder scale (https://www.researchgate.net/publication/270652917_The_Internet_Gaming_Disorder_Scale) and the Problematic and Risky Internet Use Screening Scale (http://mediad.publicbroadcasting.net/p/kplu/files/201502/PRIUSS_scale_and_guidelines.pdf).

If challenges in implementing a media use plan are anticipated, pediatric health care providers can consider introducing motivational interviewing or engaging in problem solving with parents and children about possible solutions. The pediatrician has an opportunity to discuss specific tools to address identified family needs and concerns, including social services and community resources, if needed. Finally, the pediatrician may be able to provide families with referrals to educational and informational resources, such as vetted Web sites (eg, www.HealthyChildren.org).

CONCLUSIONS

New digital and social media facilitate and promote social interactions as well as participation and engagement that involve both viewing and creating content. The effects of media use, however, are multifactorial and depend on the

type of media, the type of use, the amount and extent of use, and the characteristics of the individual child or adolescent using the media. Children today are growing up in an era of highly personalized media use experiences; therefore, parents should be encouraged to develop personalized Family Media Use Plans for their families that attend to each child's age, health, temperament, and developmental stage and ensure that each child can practice and benefit from the essentials for healthy growth and development, such as a healthy diet, good sleep hygiene, adequate physical activity, and positive social interactions.

Parents should recognize and understand their own roles in modeling appropriate media use and balance between media time and other activities. Pediatricians can help families identify and adopt a healthy Family Media Use Plan, minimize unhealthy habits and behaviors, and recognize and address issues that occur related to the use of traditional and new media that can negatively affect health, wellness, social and personal development, and academic performance and success.

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ABBREVIATIONS

AAP: American Academy of Pediatrics
app: application
ASD: autism spectrum disorder
LGBTQI: lesbian, gay, bisexual, transgender, questioning, or intersex
PBS: Public Broadcasting Service
TV: television

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PowerPoint Presentation:

Toolkit Use in Primary Care

March 6, 2017

Click here for **Algorithm**
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Reducing Screen Time for Children Under Age 6 to Prevent Language Delays

A Toolkit for Primary Care Providers

March 6, 2017

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Overview

- Pre-Presentation Survey
- DNP Capstone Project
- Objectives
- How Does Excessive Screen Time Affect Language?
- AAP Recommendations
- Integrative Review of Evidence-Based Strategies to Help Reduce Screen Time
- Toolkit and Algorithm
- Actions for Primary Care Providers
- Conclusion and Post-Presentation Evaluation

DNP Capstone Project

- Personal Introduction
- Doctor of Nursing Practice (DNP) degree
  - APRN scope of practice unchanged
  - Practice-focused doctorate
    - Requires final capstone project that translates current research into clinical application
- Capstone Project
  - Integrative Review
  - Toolkit
  - Presentation

Objectives

1. Increase awareness about the potentially harmful effects of excessive screen time on language development in children younger than 6 years old
2. Improve knowledge about evidence-based strategies to reduce screen time for this age group
3. Understand how to use family-centered collaborative negotiation when discussing lifestyle changes with patients and their families

How does excessive screen time affect language?

How does excessive screen time affect language?

- Children 15-35 mos exposed to 137 min/day of TV were **3.3 times more likely** to develop a language delay compared to those watching <20 min/day

- Hispanic infants & toddlers watching >2 hr/day had **5.5 times higher risk** of scoring lower in communication on ASQ3 after 1 yr compared to those watching <2 hr/day

Sources: Lin et al., 2015; Duch et al., 2013

How does excessive screen time affect language?

- Children who started watching TV at <12 mos old & watching >2 hr/day were **6 times more likely** to develop a language delay

- In 2-3-yr-olds, for every 1 hr of TV watched, they were exposed to **500-1000 fewer words** with significant reductions in their vocalizations, vocalization duration, & conversational turns with more TV time

Sources: Chonchaiya & Pruksananonda, 2008; Christakis et al., 2009

How does excessive screen time affect language?

- Parents spoke in shorter, 1-word sentences & **spoke less** words overall to their children when the TV was on
- Children who watched TV alone were **8.5 times more likely** to develop a language delay

Sources: Tanimura et al., 2007; Chonchaiya & Pruksananonda, 2008

How much screen time are children exposed to?

- 90% of children <2 yrs are exposed to 1-2 hr/day of TV with 14% watching >2 hr/day
- 38% of infants use mobile devices like smartphones
- Typical American child <5 yrs watches 4.5 hr/day of TV

Sources: AAP, 2011; Christakis, 2011; Rideout, 2013

Why is this important?

Receptive language delays by age 5 are a significant risk factor for social and emotional problems in adulthood

Source: Schoon et al., 2010

Additional Health Risks

- Obesity
- Violence
- Aggression
- Loss of social skills
- Attention problems
- Anxiety & depression
- Sleep deprivation
- Vision problems
- Migraine headaches
- Repetitive motion syndrome & arthritis

American Academy of Pediatrics Recommendations

AAP Recommendations

- No screen time for children <18-24 months, except video-chatting
- Limit screen time <1 hr/day of high-quality programming/apps for children ages 2-5
- Caregivers should co-view & co-use media
- No screen time during meals or for 1 hr before bedtime
- Remove TVs & other media devices from children's bedrooms

Source: AAP, 2016

Primary Care Opportunities

- Primary care setting ideal for screen time education because patients seen 12 times for routine wellness visits from ages 2-months to 5-years

- However, only 16% of pediatricians in the U.S. ask about media use

Sources: AAP, 2016; Shifrin et al., 2015

Integrative Review of Evidence-Based Strategies to Reduce Screen Time

Evidence-Based Strategies to Help Reduce Screen Time

Integrative review of 10 studies:

- 2 systematic review/meta-analyses
- 5 RCTs
- 2 pilot RCTs
- 1 pilot non-RCT

Resulted in significant reductions in screen time by **34 min/day** on average

Sources: Birken et al., 2012; Campbell et al., 2013; Dennison et al., 2004; Downing et al., 2016; Hinkley et al., 2015; Taveras et al., 2011a; Taveras et al., 2011b; Wahi et al., 2011; Yilmaz et al., 2014; Zimmerman et al., 2012

Evidence-Based Strategies to Help Reduce Screen Time

Interventions included:

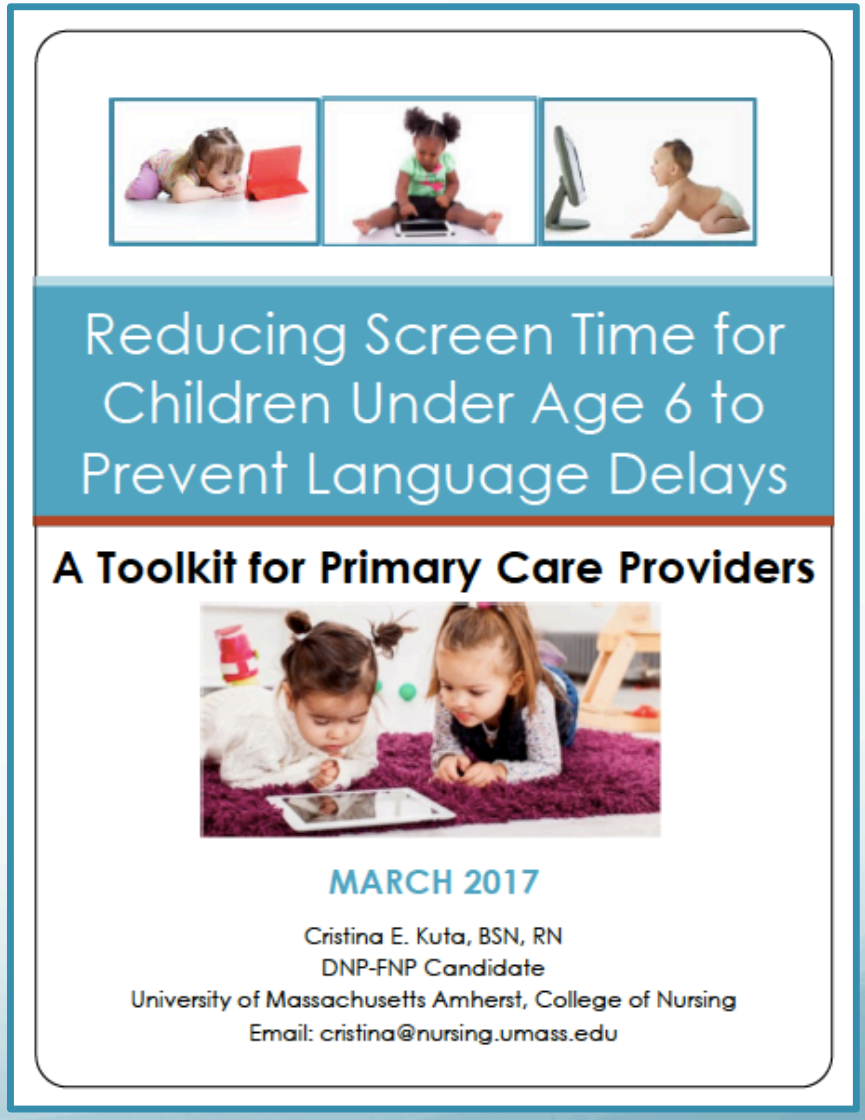
- Recurrent education using family-centered collaborative negotiation & printed materials over multiple visits
- Setting rules for use
- Co-viewing & co-using media
- Displacing screen time with other activities
- Removing TVs & other media devices from children's bedrooms

Toolkit and Algorithm

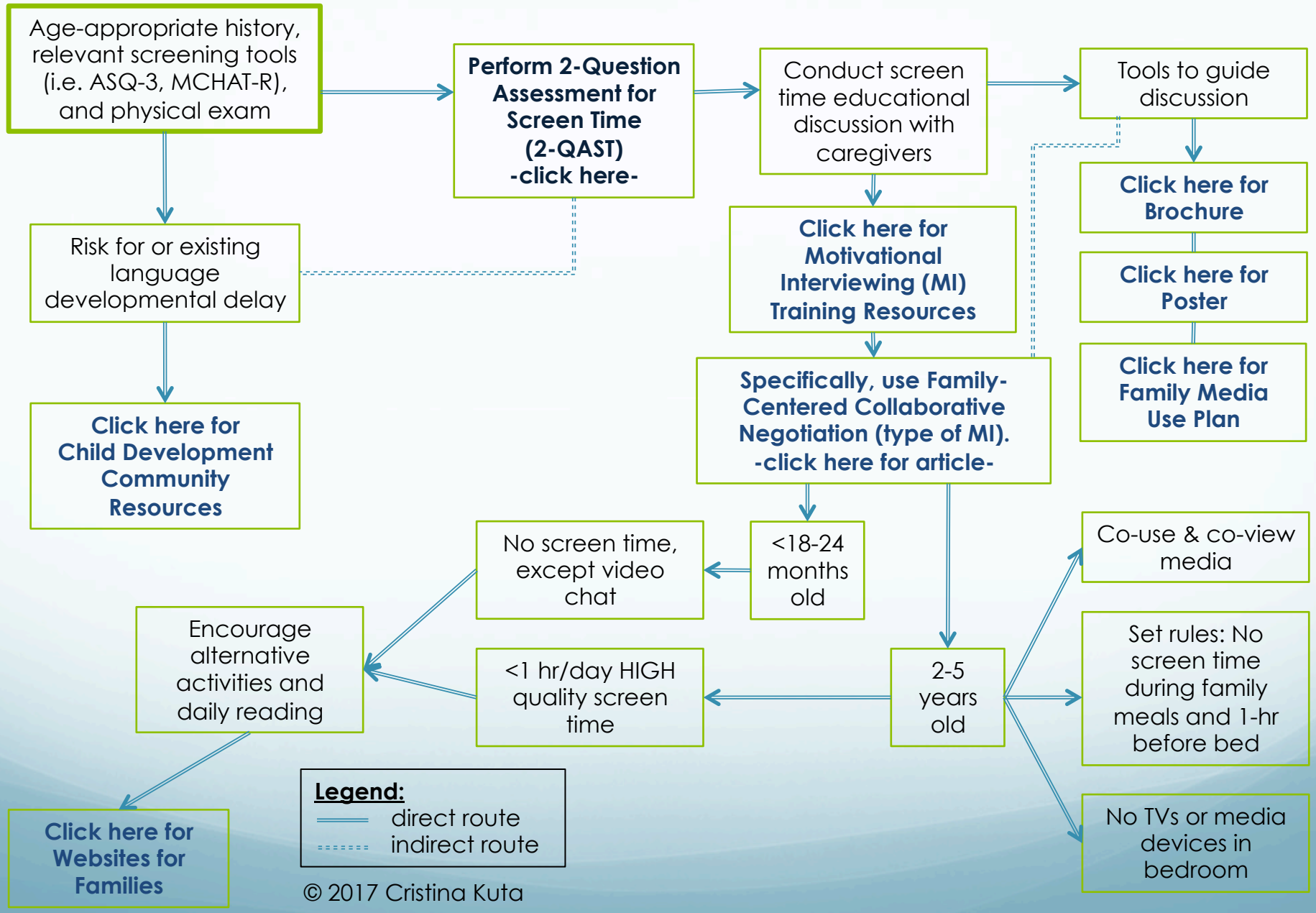
Toolkit

Content Summary

- Introduction and Purpose
- Evidence-Based Strategies to Reduce Screen Time
- Actions for Primary Care Providers
- 2016 AAP Policy Statement and Technical Report
- Motivational Interviewing Resources
- Family-Centered Collaborative Negotiation Article
- Local Child Development Community Resources
- Patient Education Resources (Brochure, Poster, Family Media Use Plan, Websites)



Screen Time Reduction Algorithm



Actions for Primary Care Providers

Actions for Primary Care Providers

Use the 2-Question Assessment for Screen Time (2-QAST) at every wellness visit:

1. How much screen time (min/hr) does your child consume daily?
2. Is there a TV or mobile media device (tablet/iPad, cell phone, computer) in your child's bedroom?

Source: AAP, 2013

Actions for Primary Care Providers

Providers should briefly cover the following:

- ✓ Excessive screen time leads to increased risk of language delays in children <6 yrs old
- ✓ Discourage screen time for children <18-24 mos old, except video-chat
- ✓ Encourage a 1-hr daily limit of high-quality screen time for 2-5 yr olds. Direct families to Common Sense Media to find age-appropriate high-quality media.

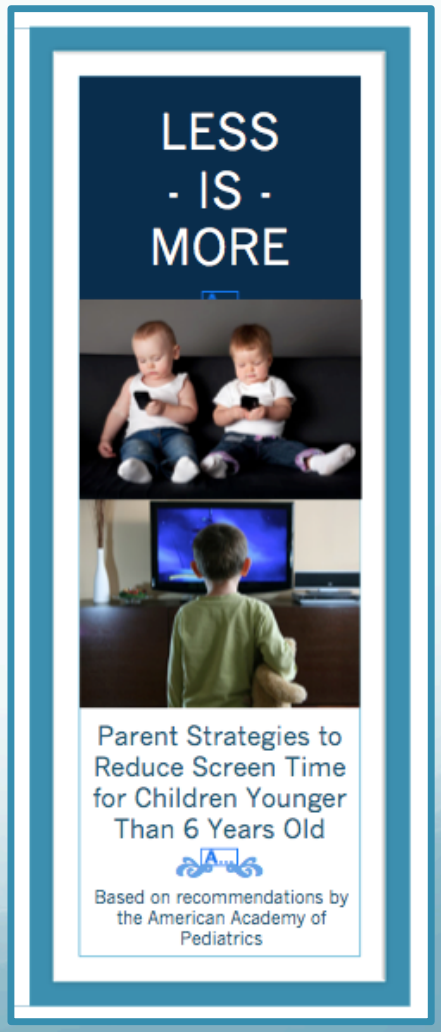
Actions for Primary Care Providers

- ✓ Encourage creation of a Family Media Use Plan
- ✓ Encourage caregivers to co-view & co-use media
- ✓ Encourage caregivers to read to their children for at least 20 min/day using an interactive approach
- ✓ Encourage caregivers to not allow screens during family meal times & 1 hr before bedtime
- ✓ Encourage caregivers to remove TVs and other media devices from their child's bedroom

Actions for Primary Care Providers

Patient Education Resources:

- Brochure
- Poster
- Family Media Use Plan
- Websites



Family-Centered Collaborative Negotiation

- Brief 5 to 15 min
- Empathetic
- Collaborative
- Patient-centered
- Self-motivational statement
- Support self-efficacy

- Provide no unsolicited advice
  - Ask permission
  - Use open-ended questions
  - Listen reflectively
- Roll with resistance
- Family/patient decide course of action

Source: Tyler & Horner, 2008

Conclusion

- Questions?
- Post-presentation evaluation
- Thank you for participating!

Thank You

- Chairperson: Dr. Jean DeMartinis, PhD, FNP-BC
- Clinical Preceptors:
  - Lt Col Brian Glodt, MD
  - Lt Col Frederico Aguilar, MD
  - Maj Jonathan Davis, MD
  - Capt Aubrey Berber, PNP
  - Capt Kristina Zucarelli, FNP
  - Capt Joel Harris, PA
  - Capt Taryn Thompson, PA
  - Lt Andrea Sumner, PA
- Thank you to my husband, Maj Matthew Kuta, for supporting me in my academic journey

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Appendix C

Pre-Presentation Survey

Pre-Presentation Survey

Presenter: _____

Date: _____

Topic: _____

Evaluator
(circle one)

MD NP PA RN Tech

1. How many minutes/hours of screen time do you consume on a daily basis? (TV/videos, streaming media, gaming, computer, tablets/iPads, smartphones) Weekdays _____ Weekends _____
2. How many minutes/hours of screen time do you think young children consume on a daily basis? Under 2 years old _____ 2-5 years old _____
3. How many minutes/hours of screen time per day is recommended for young children? Under 2 years old _____ 2-5 years old _____
4. I should reduce my daily screen time. Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree
5. I believe excessive screen time by children younger than 6-years-old may be associated with language developmental delays. Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree
6. I believe it is important to try to avoid too much screen time for children younger than 6-years-old because of the potential consequences of a language developmental delay. Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree
7. I believe decreasing screen time for children younger than 6-years-old is beneficial for language development. Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree
8. I am confident in my ability to discuss screen time with families. Strongly disagree Disagree Neither agree nor disagree Agree Strongly Agree

Pre-Presentation Survey (Cont.)

9. What barriers do you face that would prevent you from discussing screen time with families? What can be done to decrease these barriers?
10. What techniques, strategies or tools would motivate you to discuss screen time with families?

Appendix D

Post-Presentation Evaluation

Post-Presentation Evaluation

Presenter: _____

Date: _____

Topic: _____

Evaluator
(circle one)

MD NP PA RN Tech

Presentation Effectiveness Criteria

To what extent did the presentation represent the following features?	**Yes**	**Needs Work**	**No**	**Comments**
1. Purpose communicated clearly.				
2. Organized and easy to follow.				
3. Presenter exhibited a good understanding of topic.				
4. Presenter was well-prepared.				
5. Presenter spoke clearly/effectively				
6. Time for presentation used effectively.				
7. Data in slides was informative.				
8. Presenter responded effectively to audience questions and comments.				
9. Presentation was done in a way that engaged audience.				
10. Presentation enhanced understanding and knowledge about this topic.				

Post-Presentation Evaluation (Cont.)

11. What did you like most about the presentation?
12. What areas might you suggest for improvement not listed above?

Appendix E

Internal Review Board Letter of Exemption

University of Massachusetts Amherst
110 Research Administration Building
70 Butterfield Terrace
Amherst, MA 01003-9242

Telephone: 545-3428 **FAX**: 577-1728

Human Research Protection Office
Research Compliance

MEMORANDUM

To: Cristina Kuta, Nursing
From: Human Research Protection Office
Date: November 29, 2016

Project Title: ***The Negative Impact of Excessive Screen Time on Language Development in Children Under 6 Years Old: An Integrative Review with Screen Time Reduction Toolkit and Presentation for Outpatient Pediatric and Family Health Providers***

IRB Number: 16-145

The Human Research Protection Office (HRPO) has evaluated the above named project and has made the following determination:

☐ The activity does not involve research that obtains information about living individuals and therefore does NOT require IRB review and approval.

☐ The activity does not involve intervention or interaction with individuals OR does not use identifiable private information and therefore does NOT require IRB review and approval.

☒ The activity is not considered research under the human subject regulations (Research is defined as "a systematic investigation designed to develop or contribute to generalizable knowledge.) and therefore does NOT require IRB review and approval.

☐ The activity is determined to meet the definition of human subject research under federal regulations and therefore DOES require submission of applicable materials for IRB review.

For activities requiring review, please see our web pages for more on types of review or submitting a new protocol. For assistance do not hesitate to contact the Human Research Protection Office at 545-3428 for assistance.