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Caregiver Knowledge, Perceived Self-Efficacy, and Level of Confidence in Limiting Bedtime Screen Use in Preschoolers

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CAREGIVER KNOWLEDGE, PERCEIVED SELF-EFFICACY, AND LEVEL OF CONFIDENCE IN LIMITING BEDTIME SCREEN USE IN PRESCHOOLERS

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DEDICATION

This thesis is dedicated to my parents and my sister without whose support and encouragement I would not be where I am today. Thank you for your steadfast love.

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ABSTRACT

Screen time usage is a major factor leading to negative behavioral and health consequences in young children. Screen time also affects sleep, with prior research showing a significant association between screen time, particularly at bedtime, and reduced sleep duration and increased sleep problems. The initial aim of this research was to measure and attempt to increase, through an educational intervention, the knowledge, perceived self-efficacy, and confidence of study participants/primary caregivers with regard to limiting the bedtime screen use of their preschoolers with the goal of health promotion. It was intended to be a quantitative, quasi-experimental, multi-site, pre- post-intervention case study. However, because of study limitations which included issues with recruitment and poor participation (part of which is attributable to COVID-19-related restrictions), the research was adapted into a quantitative, observational descriptive design study.

The participant pool was comprised of five preschool facilities at various locations across southwest Alabama. An initial survey was prepared for caregivers of preschoolers at the five study sites. This survey included demographic questions, questions about the child's sleep habits and screen use, knowledge-based questions aimed at obtaining participant knowledge about national recommendations for sleep and screen time use, and self-efficacy and self-confidence questions. The intention was to deliver an educational intervention to be followed by a second administration of the survey to measure any differences in pre- and post-intervention knowledge, self-efficacy, and self-confidence levels. The educational intervention was prepared and delivered to the study sites.

Because of limitations, the study results were inconclusive with regard to the *a priori* research questions and hypothesis. As to the *post-hoc* research questions, quantifiable data was

obtained about the knowledge, perceived self-efficacy, and self-confidence of caregivers of preschoolers in the study pool. This data confirmed a portion of the *post-hoc* hypothesis in that knowledge of national health recommendations as to sleep and screen time use for preschoolers would be low among caregivers of preschool children in southwest Alabama. While knowledge was low, participants' perceived self-efficacy was high, a phenomenon which may be explained by the Dunning-Kruger effect.

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Caregiver Knowledge, Perceived Self-Efficacy, and Level of Confidence in Limiting Bedtime Screen Use in Preschoolers

The American Academy of Pediatrics finds that children, particularly infants, toddlers, and preschoolers, are being introduced to traditional and new technologies at increasing rates (AAP Council on Communications and Media, 2016; Wahi et al., 2011). A 2014 cross-sectional study of 350 children between the ages of six months and four years found that 96.6% used mobile electronic devices (Kabali et al., 2015). Moreover, daily use of mobile devices by children under one-year-old was reported at 43.5%, and by age two this daily use percentage increased to 76.6% (Kabali et al., 2015). The ability of children to take and use mobile media with them has further hastened this trend (Maniccia et al., 2011). Screen time usage is a major factor leading to negative behavioral and health consequences, including obesity and higher body mass index (BMI) in young children (Adachi-Mejia et al., 2007; Wen et al., 2014; Jago et al., 2016; Maniccia et al., 2011). In turn, children with elevated BMI are at greater risk for chronic disease such as hypertension, diabetes, and heart disease (Millner et al., 2018).

Screen time also affects sleep. In fact, research shows a significant association between screen time and reduced sleep duration and increased sleep problems (Hale & Guan, 2015). This includes things like bedtime resistance, sleep anxiety, night terrors, and daytime sleepiness. Poor or insufficient sleep can also lead to behavior and learning problems and, according to the National Sleep Foundation, it can even lead to things like hyperactivity and grumpiness, immune system problems, anxiety, and depression (AAP Council on Communications and Media, 2016; Garrison et al., 2011; American Academy of Pediatrics, n.d.; Wu, X. et al., 2016). These negative effects on sleep are twice as bad with portable electronic devices (*e.g.*, tablets or mobile phones), probably because of the light that emits from those which suppresses endogenous melatonin (AAP Council on Communications and Media, 2016; Twenge et al., 2019).

These phenomena of increasing childhood obesity rates and poor or insufficient sleep which place children at greater risk for future negative health consequences are prevalent across all races, incomes, and ethnicities, though children living in the southern region of the United States are at greater risk to be obese than those in other regions of the country (Le et al., 2014; Millner et al., 2018). Additionally, Millner's study found that a large percentage of children in the southeast are overweight or obese (2018), making a suburban area in southwest Alabama a priority population for intervention.

Background/Review of Literature

Prior studies recognize that childhood obesity and overweight can be affected by several factors, only one of which is screen time. For example, a study of ten-year-old children in Sweden by Garmy et al. (2018) found that insufficient sleep, measured in accordance with The National Sleep Foundation's recommendation, is associated with obesity. The findings of Anderson and Whitaker (2010) were consistent. They studied the correlation of obesity and exposure to three household routines among a cross-sectional, nationwide sample of four-year-old children in the United States. The three routines were classified as follows: having family dinners more than five nights per week, the child getting an adequate amount of sleep on weekdays (with 10.5 hours per night suggested for that age group), and limiting screen-viewing time to two hours or less on weekdays. Results of the study showed that "each of the household routines was associated with a significantly lower prevalence of obesity" (Anderson & Whitaker, 2010, p. 423). A recent survey with caregivers[1] in the participant pool indicated that the majority had regular family meals, effectively eliminating the need to address that factor in this group. Therefore, the present study targeted screen time because of the rapid rise in childhood screen

[1] "Parent," "caregiver," and "primary caregiver" are used synonymously throughout this thesis.

time usage at earlier ages (AAP's Council on Communications and Media, 2016; Kabali et al., 2015) and the correlation between screen time and sleep. More specifically, this study focused on the pre-bedtime screen usage of preschool aged children because of its negative implications on sleep and, ultimately, health.

In a randomized controlled trial on media use in children aged three to five years, researchers concluded that evening media use was associated with increased sleep problems including delays in sleep onset, more frequent night waking, nightmares/terrors, and daytime tiredness (Garrison et al., 2011). A systematic literature review of scientific literature on the association between screen time and sleep outcomes among school-aged children found a "significant association between screen time and reduced sleep duration and increased sleep problems" in 90% of the studies (Hale and Guan, 2015, p. 9). Genuneit et al. (2018) found a strong statistically significant association between electronic media consumption and overall sleep quality, and their longitudinal data showed worsening trends of bedtime resistance, sleep anxiety, and daytime sleepiness. A population-based study of children between zero and 17 in the United States showed that portable electronic devices had twice the negative effects than non-portable devices (Twenge et al., 2019). This is likely because the light of a portable electronic device can cause hyperarousal, can suppress the release of melatonin, a sleep-promoting hormone, and can delay the circadian phase of the melatonin rhythm (Twenge et al., 2019; LeBourgeois et al., 2017).

While previous studies included interventions directed at the reduction of childhood screen time, there are gaps where additional research is needed. Most of the earlier studies focus on older forms of screen time such as television and personal computers. While these are still relevant, those prior studies sometimes failed to include more recent and technologically

advanced hand-held devices such as smart phones and tablets (Schmidt et al., 2012; Wu, L. et al., 2016). The availability of these new devices has made it even more difficult for parents to limit screen use. Additionally, a 2018 qualitative study confirmed that parents are often "internally conflicted" about child screen time use given its numerous benefits (Solomon-Moore et al., 2018). Parents realize that screen time can be used as an educational tool and do not want to let their preschool age children fall behind. They also believe screen time use can help develop skills that will later increase school success as well as employability and can even be used as an "electronic babysitter." On the other hand, parents also recognize the negative aspects of screen viewing such as behavior problems, isolation, obesity and overweight, and damage to vision. The oppositional pull between these conflicting advantages/disadvantages further increases the very real parental struggle to limit screen time use, even in children younger than school age. Additionally, there is little research addressing caregiver knowledge, self-efficacy, and confidence in their ability to limit bedtime screen time use for preschoolers. The original aim of this research project was to fill this latter gap by measuring and increasing, through an educational intervention, the knowledge, perceived self-efficacy, and confidence of study participants about limiting the bedtime screen use of their preschoolers.

Screen Time and Sleep Recommendations

The American Academy of Pediatrics recommends that screen time for children between the ages of two and five should be limited to one hour per day and that children under two years of age should avoid screen time completely with the exception of video chatting (AAP Council on Communications and Media, 2016). As to sleep time, both the American Academy of Pediatrics and the National Sleep Foundation recommend 11 to 14 hours per day for one- to two-year-old children and ten to 13 hours per day for three- to five-year-old children (AAP Council

on Communications and Media, 2016; National Sleep Foundation, 2020). This is *per day* and includes both nighttime sleep and any naps. Therefore, the selected intervention was aimed at educating primary caregivers about these expert recommendations and increasing their perceived ability to effectively achieve these targets. It was directed to primary caregivers because they have the greatest influence on creating healthy habits with their children, especially with the toddler and preschool ages (Anderson & Whitaker, 2010).

Interventions Used in Prior Studies

Various methods of intervention targeting screen time reduction have been used to different degrees of success and with somewhat inconsistent results (Wu, L. et al., 2016). A meta-analysis by Wahi et al. (2011) examined the effectiveness of interventions aimed at reducing the usage of screen time by children. Thirteen studies were included in the review (from a screening of 1,120 citations). The pooling of the data showed "no apparent effect of the interventions on reduction of BMI or reduction of screen time overall." However, a "statistically significant" reduction in screen time in the subgroup of preschool-aged children was observed, making this a promising area for further intervention and study (Wahi et al., 2011; Maniccia et al., 2011).

Prior interventions included classroom-based health promotion curriculum, parent/family counseling, educational presentations and seminars, use of automated monitors and screen time controls, school-based interventions incorporated into major subject areas and physical education classes, budgeting of screen time, presentation of physical activity opportunities during and after school, and combinations thereof, with interventions ranging from one to 24 months in duration (Wahi et al., 2011; Maniccia et al., 2011).

Parent Education as an Intervention

Numerous studies have shown that parent education works. For example, a 1996 meta-analysis reviewed the outcomes of several behavioral parent training programs aimed at modifying child antisocial behavior (Serketich & Dumas, 1996). Results confirmed the effectiveness of this type of parent training. The authors noted that behavioral parent training has grown to become "one of the most widely used therapeutic interventions for children and families" (Serketich & Dumas, 1996). Other studies have shown similar successes in parent education programs (Gross et al., 2003), and a 2016 study of a community-delivered intervention for parents and caregivers of preschool children resulted in several positive self-reported changes which, if maintained, would promote a healthier lifestyle and reduce the likelihood of later obesity (Willis et al., 2016). Therefore, parent education is particularly important with regard to screen time usage and sleep since research suggests that children do not get sufficient sleep and many caregivers struggle to limit screen time (Solomon-Moore et al., 2018) and/or do not view electronic media usage as a problem given their perception that it contains a potential educational benefit (Hinkley et al., 2015).

A significant effect of screen time reduction was observed in studies where the types of interventions were health promotion curricula or counseling (Wu, L. et al., 2016). For this reason, the selected educational intervention encouraged healthy child screen time habits in toddler and preschool age children with the goal of a reduction in screen time use, particularly at bedtime when the negative effects on sleep are the greatest.

Theoretical Framework

The Health Promotion Model (Chart 1) was designed by Nola J. Pender to be a "complementary counterpart to models of health protection" (Pender, 2011). It defines health as

a positive dynamic state rather than simply the absence of disease. Specifically, it defines health as "the actualization of inherent and acquired human potential through goal-directed behavior, competent self-care, and satisfying relationships with others while adjustments are made as needed to maintain structural integrity and harmony with relevant environments. Health is an evolving life experience" (Pender, 2011). The model's goal is health promoting behavior, and it recognizes the multidimensional nature of persons as they interact within their environment toward better health. Pender's model focuses on three areas: individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes. Behavior specific cognitions and affect include perceived benefits of action, perceived barriers, perceived self-efficacy, activity-related affect, interpersonal influences, and situational influences (Pender 2011).

The Pender Health Promotion Model is based on several assumptions and several theoretical propositions, each of which were applied to this study and educational intervention. By looking at prior behavior and personal influences, goal-setting and committing to a plan of action, recognizing competing demands, and appropriate follow-up, the Pender Health Promotion Model was applied in an effort to promote better health for preschool-aged children through parental intervention.

Research Questions and Hypothesis

A Priori Questions and Hypothesis

This was initially intended to be a quantitative, quasi-experimental research study which attempted to collect quantifiable information to be used for statistical analysis of the population sample in answering the following research questions:

1. Does caregiver knowledge for recommended screen use increase after an

educational intervention?

2. What is the perceived self-efficacy for limiting screen use for caregivers of preschoolers before and after intervention?
3. How confident in limiting screen use are caregivers of preschoolers before and after intervention?

The *a priori* hypothesis was that an educational intervention aimed at caregivers of preschool aged children would increase parent knowledge, perceived self-efficacy, and confidence in limiting the screen time use of their preschool aged children to the recommended levels, thereby reducing the risk of negative health consequences.

Post-hoc **Questions and Hypothesis**

Limitations required that adaptations be made, changing the study from a quantitative, quasi-experimental research study to a descriptive study. The *post-hoc* research questions for this descriptive study were:

1. What is the knowledge level of recommended screen use among caregivers of preschool children?
2. What is the perceived self-efficacy for limiting screen use in caregivers of preschoolers?
3. How confident are caregivers of preschoolers in limiting screen use?

The *post-hoc* hypothesis was that knowledge of national health recommendations, perceived self-efficacy, and confidence in limiting screen use will be low among caregivers of preschool children in southwest Alabama.

Design Experimental Methods

A Priori and Post-hoc Designs

Originally this was to be a quantitative, quasi-experimental, multi-site, pre- post-intervention case study. The dependent variables were knowledge, self-efficacy, and self-confidence with regard to caregivers of preschool children. The independent variable was an educational intervention. When adaptations to the project had to be made due to limitations encountered, it became a quantitative, observational descriptive research design study.

Population, Setting, and Instrumentation

This research study was directed to the parents and/or primary caregivers of preschool-aged children, with recruitment of voluntary participants through a researcher-created invitational flyer distributed to parents of preschoolers enrolled at five study locations attended by the participants' children in southern Alabama. The flyers included information about the study, participant expectations, and a link to the initial survey. The initial survey was prepared by the researcher. The first thirteen questions were related to participant demographics and were obtained with permission from a prior survey created by the College of Nursing. The next two questions inquired about whether sleep and screen time recommendations were discussed at the last visit to the child's health care provider. The next nine questions were about the child's sleep habits, followed by five questions related to the child's screen-time habits. The initial survey then moved to a set of seven knowledge-based questions aimed at obtaining participant knowledge about national recommendations for sleep and screen time. This was followed by three perceived self-efficacy questions developed by and used with permission from Dr. Russ Jago (Jago et al., 2015). These questions were aimed at determining participant perceived self-efficacy to limit bedtime screen use. The final question on the initial survey was a sliding-scale

self-confidence question to determine the level of participant self-confidence in limiting their preschooler's bedtime screen use. The scale went from zero to ten, with zero representing "not at all confident" and ten representing "extremely confident."

The flyers with the initial survey links were hand-delivered to each of the five preschool sites on several occasions in an attempt to elicit the greatest response. Participants were informed that they were expected to attend an educational presentation and complete a post-intervention survey in order to be qualified for inclusion in a random drawing to win one of five gift cards. The director of the five daycare facilities encouraged participation and sent out periodic reminders to potential participants. Inclusion criteria required the parent/caregiver to be over 18 years of age, able to read and write in the English language, and the primary caregiver of a child enrolled at one of the five study locations. Though recruitment was difficult, fourteen people completed the initial surveys. The initial intention was to deliver a live, in-person educational presentation at each of the five preschool facilities from which the participant pool came, but COVID-19-related restrictions precluded that and required accommodation. Therefore, the educational presentation was delivered as a voice-over PowerPoint converted into an MP4 video file format and delivered (along with a link to the follow-up survey) to the director of the five preschool facilities who, in turn, distributed it to caregivers with children enrolled in the schools. As with the invitational flyers, the director of the facilities again encouraged participation.

The educational intervention provided information including recommendations for sleep and screen time use for preschool-aged children, information about the negative implications of screen time use in general and screen time use prior to bed, and ways for caregivers to achieve those screen time and sleep recommendations. The post-intervention survey included the same information as the initial survey with two additional questions to evaluate the presentation. The

intent was to compare the knowledge, self-efficacy, and self-confidence questions before and after the educational intervention. We were unable to deliver the presentation to the identical fourteen persons who completed the initial surveys because their email addresses were not made available. To accommodate this limitation, the study was adapted to make a comparison of the pre- and post-intervention groups. Additional limitations and poor participation precluded a pre- and post-intervention comparison, thereby forcing a change to a descriptive, quantitative, observational study.

Human Participation and Data Collection

This study was approved through the University of South Alabama Institutional Review Board (IRB) as an exempt study. Upon realization that the study design had to be changed, a modification was submitted to the IRB and approved. Data collection was done through survey responses as compiled and analyzed through Qualtrics and by the researcher.

Results

Fourteen people completed the initial survey. Only one person viewed the educational intervention and completed the post-intervention survey. The study population was predominantly minority and twelve of the fourteen parent/caregiver participants were female, with two not stating their gender/relationship to the child (Table 1). Half of the children were male, half female (Table 2). Education levels for the parents/caregivers varied, with two participants having less than a high school diploma/GED, one participant completing college/vocational school, six participants having a high school diploma/GED, and six participants having some college/vocational school (Table 3). The majority of the parents worked full time (Table 4). The ages of the children ranged from one to five, though there was one reported at age 11 which is believed to be an error since the facilities involved do not have

children that age.

A slight majority reported that their child's health care provider discussed both screen time and sleep recommendations at their last visit (Table 5). With regard to their child's habits, 71.4% reported that their child had a television in the room where they slept, and a majority reported that their child spent one to two hours per day on each of the following screen activities: television viewing, computer/laptop use, and use of hand-held electronic devices (i.e., cell phone, iPad, tablets, video games).

The responses on the knowledge-based questions varied (Table 6). Only 35.7% of participants correctly answered the question about the recommended amount of screen time viewing for children between two- and five-years old. The sleep recommendation results were worse for one- to two-year-old children, with only 28.8% of participants selecting the correct response. For the recommended amount of sleep for children aged three to five, half of the participants answered correctly. A majority (78.6%) were aware that screen viewing is not a recommended method of promoting sleep, while only 21.4% of participants were able to identify the correct recommendation for discontinuing screen viewing one hour before bed. And only 42.8% were able to identify all good sleep habits in a listing provided.

One true or false survey question asked whether it was important to introduce children to technology as early as possible to ensure that they do not fall behind their peers in achievement. Nine participants (64.3%) answered this question in the affirmative. However, this was incorrect as the American Academy of Pediatrics cautions against introducing technology early.

The final questions dealt with perceived self-efficacy and self-confidence. The self-efficacy questions asked participants to rate how much they believed they could do to (1) control the time their child spent screen viewing, (2) help their child have alternatives to screen viewing,

and (3) reduce the time their child spent screen viewing. Answer choices were nothing, very little, somewhat, and a great deal. Participants' perceived self-efficacy was interestingly high, with 71.4% believing they could do a great deal to help their child find alternatives to screen time and to reduce the time their child spent before a screen. An even higher percentage (78.6%) felt they could do a great deal to control their child's screen time overall Table 7). As to self-confidence, mixed results were noted. Caregivers were asked to self-identify their confidence in limiting their preschooler's screen viewing before bedtime. Answers ranged from no confidence at all to high confidence, yet only 28.5% of participants felt their confidence was at the highest level (Table 8).

Only one individual responded to the post-intervention survey, indicating that she viewed the educational presentation. She did not respond to the self-confidence question, precluding a comparison to the first group's confidence level. Like the majority of the initial 14 participants, she answered the self-efficacy questions with the highest possible rating of "a great deal," indicating that she believed she could do much to control her child's screen viewing time, help with alternatives, and reduce the time spent by the child before a screen. She indicated that her child, age two, gets ten hours of sleep each weeknight. This matched her selection of the nine- to ten-hour range for the recommended number of hours of sleep, though the correct answer for a two-year-old child was 11 to 14 hours. She also indicated that her child watched television three to four hours per day, used a computer/lap top three to four hours per day, and used a handheld electronic device three to four hours per day (for total screen time of between nine and 12 hours). This respondent answered four of the seven (57.1%) knowledge-based questions correctly even though she indicated that she viewed the presentation by rating it "very good" as to content and method of presentation. The three knowledge-based questions she missed dealt with

recommended sleep time for one-to-two-year-old children, recommended sleep time for three-to-five-year-old children, and recommended screen time for two-to-five-year-old children.

Discussion

The initial aim of this research project was to measure and attempt to increase, through an educational intervention, the knowledge, perceived self-efficacy, and confidence of study participants with regard to limiting the bedtime screen use of their preschoolers. The intervention was aimed at primary caregivers because they have the greatest influence on health habits in children, especially preschool-aged children. Pender's Health Promotion Model, which focuses on health promoting behavior, paired well with this goal. The study incorporated each of the three areas on which the Pender model focuses, beginning with obtaining information on individual experiences and child-specific habits through the initial survey. Both the survey and the educational intervention incorporated behavior specific cognitions such as the perceived benefits of action (health promotion), perceived barriers (internal conflict experienced by parents who do not want their children to fall behind), and perceived self-efficacy in controlling behavior. As with the 2016 Willis research, if study participants implement and maintain changes based on the educational intervention, the result would be a healthier lifestyle for their children and a reduction in the risk for negative health consequences associated with screen time.

One of the more interesting points delivered in the educational intervention was the myth-busting about early screen time giving children a technological advantage over their peers by the time they begin school. The American Academy of Pediatrics points out that higher order thinking skills (like creating and analyzing) and executive function skills (like impulse control, prioritizing, and organizing) are better learned through simple, unstructured play (AAP Council on Communications and Media, 2016). Additionally, digital media is designed in such a way that

it is intuitive for kids – they will adapt quickly and naturally and will catch on quickly once it is introduced at an older age for school-related purposes (AAP Council on Communications and Media, 2016). Getting an early start is not necessary and is, in fact, discouraged by the American Academy of Pediatrics (AAP Council on Communications and Media, 2016).

Another interesting factor was the dichotomy between participants' overall perceived self-efficacy and their knowledge with regard to screen time recommendations. While their knowledge of the national recommendations was mediocre at best, most felt that they could do a great deal (the highest answer option) to control their child's screen time, reduce their screen time, and help find alternatives to screen time. This could be explained by the Dunning Kruger effect, a type of cognitive bias in which people with limited knowledge in a given area overestimate their knowledge in relation to objective criteria or to other people (Duignan, 2020). Dunning explained that people suffer from a type of meta-ignorance, particularly with regard to unknown unknowns, relevant information that people do not know they lack (Dunning, 2011, p. 252). Dunning referred to this as a poor performer's "double curse," one where their "deficits in expertise cause them not only to make errors but also leave them unable to recognize the flaws in their reasoning" (Dunning, 2011, p. 265). This theory could also explain the poor follow-up from the initial survey participant pool. Perhaps, having completed the survey and having been made aware that it dealt with sleep and screen time recommendations, they felt they were already doing a good job in these areas and did not need to spend time on an educational presentation. This speculation is corroborated by their high self-efficacy rating on those initial surveys. Another possibility is that these initial participants did not want to be judged for the amount of screen time being allowed and did not want to have their parenting practices challenged by expert data. Sometimes "ignorance is bliss."

As a person's expertise and knowledge increase, their meta-cognitive skills likewise grow and often lead to a decline in self-confidence. Duignan (2020) notes that this phenomenon, though fairly new scientifically, dates back even to Charles Darwin to whom the axiom "ignorance more frequently begets confidence than does knowledge" is attributed." Perhaps these parents, being unaware of the actual recommendations of national experts as to sleep and screen time, thought they were making the right choices because they had no information to contradict their choices. If that were the case, the self-efficacy levels on the post-intervention surveys should have decreased. But because only one person responded to the post-intervention survey, this theory could not be tested.

Limitations

The extremely small initial sample size was a primary and significant limitation, with only 14 participants responding to the initial survey. Recruitment was difficult and there was an apparent lack of interest. There is no objective evidence of the reason for this. Perhaps parents felt they knew enough and were doing a good job with regard to screen time as discussed above. Perhaps the pandemic that plagued 2020 played a role. Struggling with COVID-related issues, participation in a research study may simply have not been a high priority. Notably, the daycare facilities selected as the setting for this research were closed for a period of time due to COVID-19 related restrictions. Because of this, adaptations had to be made to the initially intended method of delivering the educational intervention, moving from an in-person live format to an electronically delivered video presentation. There simply is not a definite answer as to why recruitment was difficult and participation low.

Another limitation was the fact that the participants who completed the initial surveys were not able to be contacted because their email and contact information were unavailable to

the researcher. Because of this, the educational presentation could not be sent directly to the initial participants and precluded a single-group study. The director of the five daycare facilities sent several reminders to all parents/caregivers, but those reminders did not elicit any follow-up from the initial pool. The design was thus modified to be a pre- and post-intervention group comparison. Ultimately, however, only one person viewed the educational intervention, making a pre- and post-intervention comparison impossible. It was because of these limitations that the study design, research questions, and hypothesis had to be changed.

Implications

Screen time can have negative health consequences, ranging from obesity and high BMI (with a related risk of chronic disease such as hypertension, heart disease, and diabetes) to poor and/or insufficient sleep (which can lead to behavior and learning problems, hyperactivity and grumpiness, immune system problems, anxiety, and depression). As a holistic profession, nursing aims at improving the health of clients and reducing the risk of negative health consequences. Because of the association between screen time and health, it is important for parents to know the appropriate limits and recommendations. An essential part of a nurse's role is to assess the need for intervention and provide client education where needed. In this role and on this topic, it is important to help parents become more knowledgeable, confident, and self-efficacious in limiting preschooler screen usage before bedtime because of the negative health implications associated with such behaviors. Nurses play a vital role in community health which includes assisting parents through teaching and providing tools for achieving health-related goals. This research is important in helping parents as they struggle to navigate through the conflict between the benefits of technology and the negative health consequences related to sedentary screen time. It is important that parents are educated about good health habits so that

they can instill these good habits in their children early. This research, therefore, is important to nursing on a dual front: its aim is not only to achieve optimal health for children, but also to help parents in their parenting role through educational interventions.

Conclusion

The final results of the research were inconclusive to the extent that limitations prevented a true assessment of the *a priori* research questions or hypothesis. The limitations, particularly the difficulty with recruitment, the extremely small sample size, and the single response to the post-educational survey, prevented an affirmation of the prior literature which shows that parent education works.

Through the adaptations which converted the project into a descriptive study, I was able to obtain quantifiable data on the knowledge, perceived self-efficacy, and self-confidence of caregivers of preschoolers in the study pool. This data confirmed the *post-hoc* hypothesis in that knowledge of national health recommendations as to sleep and screen time use for preschoolers was low among caregivers of preschool children in southwest Alabama. The hypothesis was wrong as to perceived self-efficacy which was high and self-confidence which was varied, but this may be explained by the Dunning-Kruger effect.

The educational intervention created can be used to continually educate caregivers of preschoolers at the five daycare facilities in the study pool. It could also be shared with other preschool facilities to expand the benefit of this educational intervention.

Future research in this area is warranted, and it is recommended that another attempt be made at a similar pre- and post-intervention comparisons in the future.

References

AAP Council on Communications and Media. (2016). Media and young minds. *Pediatrics, 138*(5). https://doi.org/10.1542/peds.2016-2591

Adachi-Mejia, A. M., Longacre, M. R., Gibson, J. J., Beach, M. L., Titus-Ernstoff, L. T., & Dalton, M. A. (2007). Children with a TV in their bedroom at higher risk for being overweight. *International Journal of Obesity*, *31*(4), 644–651. https://doi.org/10.1038/sj.ijo.0803455

American Academy of Pediatrics. *AAP supports childhood sleep guidelines*.. https://www.healthychildren.org/English/news/Pages/AAP-Supports-Childhood-Sleep-Guidelines.aspx.

Anderson, S. E., & Whitaker, R. C. (2010). Household routines and obesity in US preschool-aged children. *Pediatrics*, *125*(3), 420–428. https://doi.org/10.1542/peds.2009-0417

Duignan, B. (2020, September 8). *Dunning-Kruger effect*. Encyclopædia Britannica. https://www.britannica.com/science/Dunning-Kruger-effect

Dunning, D. (2011). The Dunning-Kruger effect: On being ignorant of one's own ignorance. In J. Olson and M. P. Zanna (Eds.), *Advances in experimental social psychology* (vol. 44, pp. 247-296). New York: Elsevier.

Garmy, P., Clausson, E. K., Nyberg, P., & Jakobsson, U. (2018). Insufficient sleep is associated with obesity and excessive screen time amongst ten-year-old children in Sweden. *Journal of Pediatric Nursing*, *39*. https://doi.org/10.1016/j.pedn.2017.11.009

Garrison, M. M., Liekweg, K., & Christakis, D. A. (2011). Media use and child sleep: The impact of content, timing, and environment. *Pediatrics*, *128*(1), 29–35. https://doi.org/10.1542/peds.2010-3304

Genuneit, J., Brockmann, P. E., Schlarb, A. A., & Rothenbacher, D. (2018). Media consumption and sleep quality in early childhood: results from the Ulm SPATZ health study. *Sleep Medicine, 45*, 7–10. https://doi.org/10.1016/j.sleep.2017.10.013

Gross, D., Fogg, L., Webster-Stratton, C., Garvey, C., Julion, W., & Grady, J. (2003). "Parent training of toddlers in day care in low-income urban communities": Correction to Gross et al. (2003). *Journal of Consulting and Clinical Psychology*, *71*(3), 442–442. https://doi.org/10.1037/0022-006x.71.3.442

Hale, L., & Guan, S. (2015). Screen time and sleep among school-aged children and adolescents: A systematic literature review. *Sleep Medicine Reviews*, *21*, 50–58. https://doi.org/10.1016/j.smrv.2014.07.007

Hinkley, T., Cliff, D. P., & Okely, A. D. (2015). Reducing electronic media use in 2-3 year-old children: feasibility and efficacy of the family@play pilot randomised controlled trial. *BMC Public Health*, *15*(1). https://doi.org/10.1186/s12889-015-2126-2

Jago, R., Zahra, J., Edwards, M. J., Kesten, J. M., Solomon-Moore, E., Thompson, J. L., & Sebire, S. J. (2016). Managing the screen-viewing behaviours of children aged 5–6 years: A qualitative analysis of parental strategies: Table 1. *British Medical Journal Open*, *6*(3). https://doi.org/10.1136/bmjopen-2015-010355

Jago, R., Wood, L., Zahra, J., Thompson, J. L., & Sebire, S. J. (2015). Parental control, nurturance, self-efficacy, and screen viewing among 5- to 6-year-old children: A cross-sectional mediation analysis to inform potential behavior change strategies. *Childhood Obesity*, *11*(2), 139–147. https://doi.org/10.1089/chi.2014.0110

Kabali, H. K., Irigoyen, M. M., Nunez-Davis, R., Budacki, J. G., Mohanty, S. H., Leister, K. P., & Bonner, R. L. (2015). Exposure and use of mobile media devices by young children. *Pediatrics*, *136*(6), 1044–1050. https://doi.org/10.1542/peds.2015-2151

Le, A., Judd, S. E., Allison, D. B., Oza-Frank, R., Affuso, O., Safford, M. M., Howard, V. J., & Howard, G. (2013). The geographic distribution of obesity in the US and the potential regional differences in misreporting of obesity. *Obesity*, *22*(1), 300–306. https://doi.org/10.1002/oby.20451

Lebourgeois, M. K., Hale, L., Chang, A. M., Akacem, L. D., Montgomery-Downs, H. E., & Buxton, O. M. (2017). Digital media and sleep in childhood and adolescence. *Pediatrics*, *140*(Supplement 2). https://doi.org/10.1542/peds.2016-1758j

Maniccia, D. M., Davison, K. K., Marshall, S. J., Manganello, J. A., & Dennison, B. A. (2011). A meta-analysis of interventions that target children's screen time for reduction. *Pediatrics*, *128*(1). https://doi.org/10.1542/peds.2010-2353

Millner, V., McDermott, R. C., & Eichold, B. H. (2018). Alabama children's body mass index, nutritional attitudes, and food consumption: An exploratory analysis. *Southern Medical Journal*, *111*(5), 274–280. https://doi.org/10.14423/smj.0000000000000808

National Sleep Foundation. (2020, September 24). *How much sleep do babies and kids need?* https://www.sleepfoundation.org/children-and-sleep/how-much-sleep-do-kids-need.

Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2011). *Health promotion in nursing practice*. Upper Saddle River, N.J: Prentice Hall.

Schmidt, M. E., Haines, J., O'Brien, A., McDonald, J., Price, S., Sherry, B., & Taveras, E. M. (2012). Systematic review of effective strategies for reducing screen time among young children. *Obesity*, *20*(7), 1338–1354. https://doi.org/10.1038/oby.2011.348

Serketich, W. J., & Dumas, J. E. (1996). The effectiveness of behavioral parent training to modify antisocial behavior in children: A meta-analysis. *Behavior Therapy*, *27*(2), 171–186. https://doi.org/10.1016/s0005-7894(96)80013-x

Solomon-Moore, E., Matthews, J., Reid, T., Toumpakari, Z., Sebire, S. J., Thompson, J. L., Lawlor, D.A., & Jago, R. (2018). Examining the challenges posed to parents by the contemporary screen environments of children: a qualitative investigation. *BioMed Central Pediatrics*, *18*(1). https://doi.org/10.1186/s12887-018-1106-y

Twenge, J. M., Hisler, G. C., & Krizan, Z. (2019). Associations between screen time and sleep duration are primarily driven by portable electronic devices: Evidence from a population-based study of U.S. children ages 0–17. *Sleep Medicine*, *56*, 211–218. https://doi.org/10.1016/j.sleep.2018.11.009

Wahi, G., Parkin, P, Beyene, J., Uleryk, E., & Birken, C. (2011). Effectiveness of interventions aimed at reducing screen time in children. *Archives of Pediatrics & Adolescent Medicine*, *165*(11), 979. https://doi:10.1001/archpediatrics.2011.122

Wen, L. M., Baur, L. A., Rissel, C., Xu, H., & Simpson, J. M. (2014). Correlates of body mass index and overweight and obesity of children aged 2 years: Findings from the healthy beginnings trial. *Obesity*, *22*(7), 1723–1730. https://doi.org/10.1002/oby.20700

Willis, T., Roberts, K., Berry, T., Bryant, M., & Rudolf, M. (2016). The impact of HENRY on parenting and family lifestyle: A national service evaluation of a preschool obesity prevention programme. *Public Health*, *136*, 101–108. https://doi.org/10.1016/j.puhe.2016.04.006

Wu, L., Sun, S., He, Y., & Jiang, B. (2016). The effect of interventions targeting screen time reduction. *Medicine*, *95*(27). https://doi.org/10.1097/md.0000000000004029

Wu, X., Tao, S., Rutayisire, E., Chen, Y., Huang, K., & Tao, F. (2016). The relationship between screen time, nighttime sleep duration, and behavioural problems in preschool children in China. *European Child & Adolescent Psychiatry*, *26*(5), 541–548. https://doi.org/10.1007/s00787-016-0912-8

Appendices: Tables/Figures

Chart 1. Health Promotion Model (Pender, 2011)

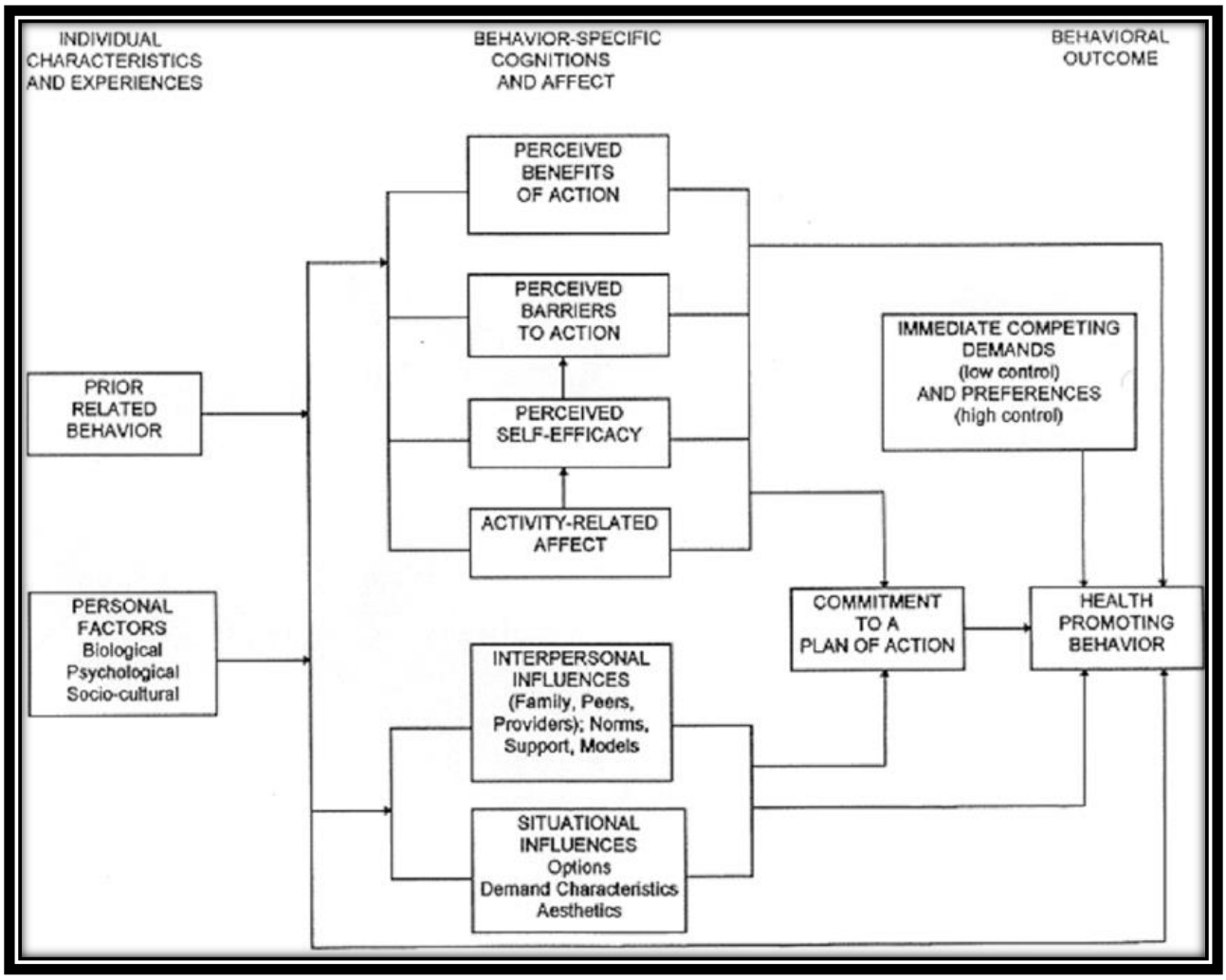

Table 1. Initial Survey Caregiver Demographics (Gender and Race)

Female	n=12 (85.7%)
Male	n=0 (0%)
No Response	n=2 (16.6%)
African American, Non-Hispanic	n=11 (78.6%)
African American, Hispanic	n=1 (7.1%)
White	n=2 (14.2%)

Table 2. Initial Survey Preschooler Demographics (Gender and Race)

Female	n=7 (50%)
Male	n=7 (50%)
African American, Non-Hispanic	n=12 (85.7%)
African American, Hispanic	n=1 (7.1%)
White	n=1 (7.1%)

Table 3. Caregiver Level of Education

Less than High School/GED	n=2 (14.2%)
High School/GED	n=5 (35.7%)
Some College or Vocational School	n=6 (42.8%)
Graduated from College/Vocational School	n=1 (7.1%)

Table 4. Caregiver Employment Status

Working full time (> 35 hours per week)	n=8 (57.1%)
Working part time	n=1 (7.1%)
Student	n=2 (14.2%)
Looking for Work	n=2 (14.2%)
Disabled	n=1 (7.1%)

Table 5. Interaction with Healthcare Provider

Recommended Sleep Time Discussed		
Yes	No	Does Not Recall
n=8 (57.1%)	n=4 (28.5%)	n=2 (14/2%)

Recommended Sleep Time Discussed		
Yes	No	Does Not Recall
n=9 (64.3%)	n=3 (21.4%)	n=2 (14.2%)

Table 6. Correct Answers to Knowledge-Based Questions

Recommended amount of screen time for ages 2 to 5 (1 hour per day)	n=5 (35.7%)
Sleep recommendation for 1 to 1 year olds (11 to 14 hours per day)	n=4 (28.5%)
Sleep recommendation for 3 to5 year olds (10 to 13 hours per day)	n=7 (50%)
Screen viewing is not a recommended method of sleep promotion	n=11 (78.6%)
Discontinuation of screen use one hour before bed is recommended	n=3 (21.4%)
Able to identify all good sleep habits from a list	n=6 (42.8%)
Fallacy of need to introduce children to technology as early as possible	n=5 (35.7%)

Table 7. Perceived Self-efficacy Questions

	Nothing 1	Very Little 2	Somewhat 3	A Great Deal 4
How much can you do to control the time your child spends screen viewing (e.g., watching TV or DVDs, playing video games, or using a computer)?	n=1 (7.1%)	0	n=2 (14.2%)	n=11 (78.6%)
How much can you do to help your child have alternatives to screen viewing?	0	n=3 (21.4%)	n=1 (7.1%)	n=10 (71.4%)
How much could you do to reduce the time your child spends screen viewing?	n=1 (7.1%)	n=2 (14.2%)	n=1 (7.1%)	n=10 (71.4%)

Table 8. Sliding Scale Confidence Question (What is your level of confidence in limiting your preschooler's screen-viewing before sleep? 0 (not at all confident) to 10 (extremely confident)

Confidence Level	Response
0	n=2 (14.2%)
1	n=1 (7.1%)
4	n=1 (7.1%)
5	n=2 (14.2%)
6	n=1 (7.1%)
7	n=1 (7.1%)
8	n=2 (14.2%)
10	n=4 (28.5%)

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