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“Go Outside and Play!” Qualitative Investigation of the Cognitions, Barriers, and Supports for Recommended Active Play and Screentime Behaviors of Parents and School-Age Children

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Abstract

Objective: To qualitatively explore the cognitions of parents and school age children (ages 6 to 11 years old) related to physical activity and screentime.

Methods: A total of 44, 6-11 year old children and 37 parents from 3 states (FL, NJ, and WV) participated in focus group discussions. Their responses were content analyzed to identify trends and themes.

Results: Content analysis indicated that parents understood the importance of physical activity, but reported time scarcity and limited space for activity was key barriers. Children identified the same main barriers in addition to not having playmates and being distracted by technology. Kids relied on parents to remind them to be active and were more likely to be active when parents played with them. Despite identifying parent: Child co-play as an opportunity to model healthy behaviors and bond with children, parents played actively with children 2.96 ± 1.87 SD days/week; largely due to other commitments. Parents believed screentime should be limited, but also saw it as a relaxation method and way to entertain children. Kids believed it was important to limit screentime. A common strategy parents used to limit screentime was setting daily screentime limits. Most kids reported that; being reliant on parents for enforcing screentime limits.

Conclusion: Interventions to improve physical activity and screentime behaviors in families with school-aged children are needed. Future interventions should incorporate the recommendations arising of this study and assess their

effectiveness in improving physical activity and screentime behaviors.

Keywords: Parent; Child; Theory; Focus groups; Physical activity; Screentime; Sedentary behaviors

Introduction

Childhood obesity remains a pertinent health concern as 18% of school-age children (i.e., children ages 6 to 11) are obese (Body Mass Index (BMI) for age $\geq 95^{\text{th}}$ percentile) [1]. The rate of obesity is higher in school-age children than preschool children (14%), due to continued unhealthy weight gain through the growing years [1,2]. Childhood obesity is associated with numerous negative health consequences including cardiovascular risk factors and the early onset of chronic diseases [3,4]. Overweight and obese children also experience psychological distress as a result of social stigmatization and teasing [3]. Additionally, obese children are more likely to grow into overweight adults [3,5].

Excessive screentime and limited physical activity (or actively play in childhood) are two behaviors that are positively associated with BMI and waist circumference [6,7]. These behaviors are closely related, with increased screentime often associated with decreased time spent being physically active [8]. As an example, children who have a media device in their bedrooms or have hand held media devices (e.g., cell phones, video games) engage in significantly more screentime and less physical activity than children without media devices in bedrooms [9-11].

Sedentary media use is associated with decreased physical activity and can interfere with sleep, thus for children ages 6 and

older, the American Academy of Pediatrics (AAP) recommends that parents set consistent limits on screentime use that allow children to engage in at least 1 hour of physical activity a day and get 8 to 12 hours of sleep each night [12]. As few as 2.5% of school-aged children are meeting recommendations for sleep duration [13]. Less than half (43%) of children in the U.S. meet the recommendations for 1 hour of physical activity daily [14]. Only 39% of children ages 6 to 11 get less than 2 hours of total screentime daily [14]. The reasons why the AAP recommendations are not met by many children remains unclear, emphasizing the need for greater research to elucidate barriers and facilitators for meeting screentime and physical activity recommendations.

The school-aged years provide unique challenges for promoting weight-related behavior change including limiting screentime and increasing physical activity. School-age children are influenced by their parents, who set health-related rules and guidelines in the home and make many health-related decisions for their children [15,16]. However, the transition from preschool to elementary school is associated with an increased amount of time spent away from parents [17]. Thus, school-age children are responsible for making an increasing number of health-related decisions for themselves [18]. Still, as the observational learning construct of the Social Cognitive Theory suggests, the behaviors modeled by parents influence children's health-related decisions and behaviors [19-21]. Parental beliefs about active playtime and screentime and the encouragement, support and guidance they provide for their children also appear to have a strong influence on screentime and active play behaviors of their school-aged children [15,22-26].

As health-related behaviors and beliefs established during childhood track into the adolescent and adult years [27], forming obesity-preventive lifestyle habits during the childhood years is paramount. However, much remains unknown about parent beliefs and modeling behaviors related to screentime and active playtime and the beliefs school-aged children have about these health behaviors. Research on parents' cognitions (i.e., beliefs, attitudes, perceived barriers and facilitators related to active playtime and screentime) is limited as is research on children's screentime and active play cognitions.

Social Cognitive Theory considers the interaction between individuals and their environment and how this bidirectional relationship allows the individuals to both influence and be influenced by their environment. This concept is referred to as 'reciprocal determinism' [21,28,29]. Social Cognitive Theory is well-suited for designing programs promoting behavior change in families as it focuses on both individual and group behavior change. Constructs of SCT including self-efficacy (personal confidence in ability to perform a behavior), collective efficacy (group [family] confidence their ability to perform a behavior) and observational learning (learning behavior through role models) are particularly relevant in a family setting [21,28,29]. Additionally, understanding perceived barriers and facilitators to behavior performance can help health educators to empower individuals to engage in behavior change [21,28,29].

Thus, an objective of this study was to qualitatively explore the cognitions related to active play and screentime of 6 to 11

year old children and their parents. A second objective was to identify strategies based on the Social Cognitive Theory that could be incorporated in future obesity prevention programs that could enable families to reduce leisure screentime use and increase physical activity levels for both parents and children.

Methods

The Institutional Review Boards at Rutgers, the State University of New Jersey, West Virginia University and the University of Florida approved this study. All adult participants gave written informed consent. Parents or guardians gave written informed consent for participating children and all children gave verbal assent.

Sample

Parents of 6 to 11 year old children whose primary language was English or Spanish were recruited *via* flyers, word of mouth, and electronic postings targeting parents in New Jersey, Florida, and West Virginia. Recruitment announcements invited parents to participate in a discussion about small, simple changes they could make at home to help their children grow up healthier. Parents were paid \$25 for participating in a 60 minute focus group. Children aged 6 to 11 year old were recruited similarly and were paid \$15 for participating in a 30 minutes focus group discussion. No parent or child participated in more than one focus group. Participating children were not necessarily children of participating parents.

Instruments

Before the focus group began, parents completed a brief survey that collected demographic characteristics (e.g., age, highest education level, number and ages of children) and behaviors related to the focus group topic (e.g., number of days parents play with their school-age child hard enough to make the parent and child sweat or breathe hard, hours children watch TV or videos daily, whether children request items seen in television commercials). Children also completed a brief questionnaire prior to focus groups that asked their age, grade, number of kids in the family and days per week they play hard enough to sweat or breathe hard, watch TV or movies for more than 2 hours, and play computer games for more than 2 hours.

All focus groups were conducted using a structured moderator's protocol developed according to standard guidelines [30,31]. Questions in the moderators' guide were developed to explore Social Cognitive Theory constructs, including addressed, self-efficacy, observational learning, outcome expectations, perceived barriers and facilitators of behavior change. Researchers conducting the focus groups completed formal training and practice sessions to ensure uniformity across data collection sites. Researchers fluent in the primary language of the parents (i.e., English and Spanish groups were held separately) conducted the focus groups. Given children's fluency in English, all child focus groups were conducted in English. Focus groups with younger children (ages

6 to 9) were conducted separately from those with older children (ages 9 to 11).

The focus group questions posed by the researcher serving as the moderator were based on key Social Cognitive Theory [21,28,29] constructs and were designed to gain an understanding of attitudes toward active play and screentime, barriers to engaging in active play and screentime practices, and strategies used to overcome barriers. Parent focus groups explored both screentime and active play. Given the shorter attention span of children, screentime was explored in focus groups separate from those discussing active play. A second trained researcher took comprehensive notes documenting focus group discussions. Within 48 hours of the end of each focus group, the note taker transcribed notes; the moderator reviewed the documentation for clarity, completeness, and accuracy; any discrepancies were discussed and consensus reached. Notes from Spanish language focus groups were translated into English by the note taker documenting the focus group discussion. Inconsistencies in translation were discussed to reach consensus by the researchers for the particular focus group.

Data Analysis

SPSS version 21.0 (Chicago, IL) was used to analyze survey data and create descriptive statistics. Three trained researchers used standard content analysis procedures to identify themes in the focus group data [32,33]. These procedures generate impartial, methodical, and quantitative descriptions [34] that enable researchers to make “replicable and valid inferences from the data to their context” [35]. Researcher’s independent content analyses were compared and differences discussed to reach unanimous agreement. The constant data comparison method was implemented synchronously with data collection to establish the point of data saturation (or information redundancy) thereby indicating when data collection should conclude [32,36].

Results

A total of 37 parents (95% female) participated in 1 of 11 focus group discussions addressing active play and screentime. Parents had an average age of 38.97 ± 4.42 SD years and 2.35 ± 0.95 SD children under 18 living in their homes. Most parents (81%) had at least some college education. Most (76%) participating parents spoke English whereas 24% spoke Spanish. Geographic distribution was similar across states (n=14 FL, n=12 NJ, n=11 WV).

A total of 44 children (52% girls) participated in 1 of 15 focus group discussions addressing active play. These children had an average age of 8.50 ± 1.82 SD years. Children reported having an average of 1.51 ± 1.55 SD siblings younger and 1.14 ± 2.57 SD older than them. Geographic distribution was fairly even across states (n=14 FL, n=13 NJ, n=17 WV). Likewise, for the 39 children (38% girls) who participated in 1 of the 15 focus groups exploring screentime, their average age was 8.21 ± 1.72 SD years. They had a mean of 1.05 ± 0.93 SD siblings’ younger and 1.61 ± 3.00 SD older than them. These children were similarly

distributed across the data collection locations (n=14 FL, n=11 NJ, n=14 WV).

Parent Focus Groups

Survey results indicated that parents actively played with children an average of 2.96 ± 1.87 SD days/week. Parents reported their children engaged in 2.51 ± 2.60 SD hours of screentime daily. Less than a quarter of the parents indicated their children had asked for foods or beverages they saw advertised on television in the past week. A comparison showed neither active play with children nor children’s screentime differed by parents’ primary language spoken or geographic location. Focus group data were similar across geographic location and primary language spoken.

Parents’ attitudes toward active playtime

Parents felt that it was “important to set aside time each day” for their children to play actively. Parents understood that “playing outside does burn calories” and they cited promoting physical health (“get the heart going”), stress reduction (“They need a break between school and homework”) and improved mood (“They’re happier and full of energy”) as the primary benefits of exercise for their children. Other perceived benefits of active play included developing social skills (“learning how to interact with each other”), “build[ing] good lifestyle habits”, and improving sleep (“They are tired at night. They do not fight sleep”). Parents also noted that they promote activity to their children to “keep them busy so they stay out of trouble”. Parents indicated kids engaged in outdoor play (“We go out and play”, “[go] to the park”) as well as organized activities (“activities through school and rec programs”, “kids play sports”). Although parents understood the importance of active play time for their children, many admitted that they “don’t give it enough importance” and “do not force [their] child to play actively”.

Parents’ perceived barriers to active playtime

Time scarcity was a key barrier to active play. Parents felt that “between [all the] activities [they are involved in] and schoolwork” kids don’t always “have time to be physical and get some sun”. Being involved in many activities means that kids do not get home until late and after completing their homework “they are tired and don’t want to do anything.” Bad weather (“when it is really hot”, “rain and snow”), seasonal changes (“It’s hard during the winter, the days are shorter... you don’t want to go for a walk in the dark”), and unsafe surroundings (“main road is unsafe”) were additional barriers to kids’ active play identified by parents. Some parents found it challenging to find active play opportunities for kids within the home that were quiet (“We live on the second floor. The people living underneath us would be able to hear my son playing indoors”) and required little space (“my house is really small, so she can’t do stuff like hula hoop”). Some parents relied on organized activities to keep kids physically active but found that it “is expensive to keep them enrolled in sports” and cost “limits what we can do”. Changes parents noticed as kids moved from preschool to elementary school were also a concern; parents pointed out that “in school

they are not active at all; in preschool, kids are active all day; in middle school, there is no outside time, no recess...so activity is all afterschool". Parents also noted that, in general, their children "were more motivated to play when they were younger" and now they "want to spend more time on their phone or watching TV" and as a result, parents "need to push them to go out and run and play" more now.

Parents' strategies for overcoming barriers to active playtime

Parents indicated that making active play time a habit by weaving it into their daily schedules would be the most effective method for overcoming barriers to active play time. Parents felt "set[ting] some time aside" for active play and "making it a consistent part of the routine" would be helpful for increasing children's active play time, acknowledging that "even 10 to 15 minutes is good". To help fit active play time into their schedules, parents suggested "preparing meals ahead of time so that [parents] have more time to spend with [their children] instead of preparing meals every day". To overcome the barrier of lack of space for indoor play, parents suggested creating "an area where it is acceptable for [children] to jump around without worrying" by moving furniture to the side to create an open space and removing breakable objects from the area. Other parents suggested finding alternative indoor areas, for example, "take [children] to play place" where they can safely be active indoors.

Some parents suggested enrolling children in organized activities "through school and rec programs" or "summer programs, swim classes, and basketball camps" while others preferred unstructured recreational activities. In some cases, parents reported needing to enroll children in a "variety of activities" until they found something their child enjoyed. Parents found motivation to promote activity to their children by thinking of the benefits and knowing that "You feel better at the end of the day if you've done something [to help kids be active]".

Parents' attitudes towards parent:child co-play

Parents saw active parent: Child co-play as a way for parents to "model being active" and set an example for their children. Parents believed that "kids don't do what you tell them to do, but rather what you do" and therefore felt that parents' physical activity behaviors influenced their children's behaviors and these children are "more active because [parents] are more active". Parents also saw co-play as a bonding opportunity and a chance for parents to "strengthen their relationship with their child". Taking time to be active with children shows kids that parents are "interested in what [the child] is interested in and lets [the child] be aware that [the parent is] here for them." Many of the parents also saw co-play as a "stress reliever" as it provided an opportunity "to focus on children and let other worries go".

Parents' perceived barriers to parent: child co-play

Busy schedules, including parents' work schedules and kids' afterschool activities, limit the amount of time parents have to

engage in co-play with their children. Another major barrier is parent energy levels. Many parents reported feeling tired or lazy after work. Parents also reported that if they had been physically active on their own earlier in the day, they would need to explain to their child that "I have already exercised and I do not have to do that again". In some cases, parents did not make co-play a priority because their child "has been so active in other activities" that he or she already met physical activity recommendations. Parent: child co-play was perceived to be less necessary as children moved from preschool to elementary school because "as they get older [parents] can let them be active on their own" and less supervision is required. Parents also were less likely to engage in co-play with older children because parents "think [children] like to play more together [with other kids] because [parents] can't keep up with them now [that they are older]".

Parent strategies for overcoming barriers to active playtime

Parents reported that a key to parent: child co-play is to "find something that you both enjoy". Some parents try playing "whatever [their child] wants to play" and other parents suggested "using [the parent's] favorite game from when [they] were a child". Parents also emphasized that it is "okay to be silly and act like a child with your child when you play with them". As children get older, parents noted that they "have to make a conscious decision to be part of [active play] because [children] are older and don't care [if the parent participates] and don't need [the parent's supervision]". Parents have to make a concerted effort to "participate with them instead of sitting down and hanging out".

Parents' attitudes toward screentime

Parents reported using screentime (e.g., watching TV, movies, or videos, playing computer games) as a way to "wind down and relax after a hard day", to occupy children in the car or while waiting for appointments, and as a "convenient" way to "babysit" and "keep [children] entertained" while parents complete chores ("only way for mom to do something else around the house without them getting bored"). Parents felt it was important to limit their children's screentime because it made them "lazy" or they got so absorbed they were tuned-out "zombies." Some parents also noted that television and movies set the "stimulation bar" high and "really affects what they think their world should be like and what they expect, sometimes it changes them and their behavior and their thoughts about things". Others thought limiting screentime was important, otherwise children spent less time on homework, doing chores around the house, and engaging in other activities such as reading and playing outside. Some noted that watching too much television interfered with children's sleeping ("They don't sleep as well at night") and mood ("My kids are fussy if they watch too much TV"). Although many reported children had little exposure to commercials because of the type of screentime they used (e.g., Netflix, on demand movies/streaming video), some commented that their children are affected by

commercials and want advertised items or premiums offered with the advertised item (e.g., toy with a hamburger).

Parents' perceived barriers to limiting screentime

A few parents indicated that they did not have trouble limiting screentime because "kids get bored with TV", "children are always on the go—no real time to watch TV", and "It has never been an option with watching TV, so they just don't watch it." However, most parents found limiting screentime difficult ("I am struggling with having her stop watching television for long hours"), indicating that when they did try to reduce screentime it was hard to maintain change ("you want to make a change, but the next day you end up just doing the same thing that you always do"). Limiting screentime was especially hard when the weather is bad, when parents are at work ("I'll come home from work and the kids are watching TV"), or parents are tired and "lack the energy to fight" and find they "just walk away and let the kids watch the TV." One parent indicated that even though the TV is off when children go to bed, kids "still watch TV or play games on their phones" and mused that maybe only letting children have their phones at home on the weekend may be a way to limit screentime. A few parents felt powerless over controlling children's screentime: "For me nothing has helped" and "I don't have a TV, but they still have their phones".

Parents' strategies for overcoming barriers to limiting screentime

Parents reported an array of strategies for controlling screentime. A common method was to plan which TV programs would be watched and set time limits before using media devices to minimize "screaming and tantrums" as well as manage time ("Sometimes we'll sit down to watch TV and we end up watching it for 2 hours without even realizing it."). Others used timers on tablets or other media devices that automatically turned them off at a predetermined time. To prevent children from turning media devices on, some parents hid remote controls or used password protection. Screentime limits were particularly common on weekdays during the school year to ensure homework was complete, noting that "teachers send lots of homework".

Other practices for controlling children's screentime included restricting the amount of technology in the household, eliminating TVs in children's bedrooms, having only one TV, and placing televisions in less accessible locations ("Our TV is not in the living room—it's downstairs. So they [my kids] don't just come in and turn it on reflexively; it has to be intentional. TV is not the main location/focal point of house). Another acknowledged that "If I let my kids have unlimited screentime, they would just do that. It's a matter of availability. If you take it away they come up with creative ways to play".

Parents also used distractions to divert children away from media devices. For instance, one parent emphasized that it was important to her that she had time to talk with her child, so "I lure him away from it [the television] to engage in a conversation with me." Several parents indicated that they provided alternate activities their children enjoy (e.g., toys,

puzzles, afterschool activities, sports, home garden, bike riding, meal preparation responsibilities, family play time) and assigned chores to engage children because "kids get 'twitchy' without a tablet, but are fine when engaged in another activity". Another suggestion was for parents to "organize the schedule so there is time to spend with children. The priority should be quality time with kids".

One parent reported having a system that allowed children to "save up" screentime by earning it in other activities (e.g., chores, reading, solving math problems). For example, one hour of reading yielded 30 minutes of screentime. "If they [my kids] want a bedtime show or video game, they know how much [screentime] they have to save".

Parents also realized that modeling appropriate screentime behaviors could help overcome barriers to controlling children's screentime. Kids "will follow what you do or teach them". "I have a cousin and her children are always watching TV and she is always on her cell phone. She will tell them to turn off the TV, but she is still playing on her phone.... you have to be a model for your children." "I don't really watch it [TV] either, so they [children] can't say I'm doing it".

To limit children's screentime, a few parents felt "it's a matter of doing it." Parents "just have to deal with the screaming and tantrums and let them [kids] know who's in charge." They also pointed out that "...in some situations, the kids are in charge and not the parents" and that "reminding the parents that they have control over the family" is important. Additionally, if parents decide to exert control over children's screentime, they need to realize the trade-offs. For instance, if media devices are not used to occupy children while parents complete chores, "you have to be OK with a messy house".

For those wanting to change screentime behaviors, parents recommended "setting realistic goals," "cutting [screentime] down little by little," "finding new ways to relax" ("Instead of giving them [children] a phone to calm them down, give them a toy"), and enticing children to interact with parents ("If I entertain myself with arts and crafts, then he will become interested in doing what I am doing". "If I am in the kitchen, she will come over to me and wonder what I am doing."). Parents also recommended providing children with alternate, enjoyable activities ("Cutting down on television watching would not work unless she [my daughter] wants to do something that she is interested in, such as baking") that "eat up time in a positive way". Parents recognized that making changes required "stick-to-it-iveness" and that "If you really want it, you have to be the parent and not the friend for a little while".

Parents cautioned that "kids are not going to like it [screentime reductions] at first, but you [parents] have to push through the uproar" "to create the [new] habit". One parent testified that they "put the work in ... [to] break the bad habit". "Our kids do not really get upset now if we say no more TV. They are used to it now". Parents also recommended having "consistent limits and boundaries, so even if you are having a crazy days, then kids know this is the amount they can watch". Other suggestions were to avoid programs showing "aggressive things with killing or violence" and "try to find educational

shows, something less mindless if you are going to have screentime. If you aren't going to win the battle of screentime, maybe win the battle of what they are watching," play "a dance video...and dance together," and make screentime a family event, "do more movie family night activities".

Children's Focus Groups

Survey results indicate children played hard enough to sweat or breathe hard an average 4.33 ± 2.67 SD days per week. Children reported watching TV, movies, or videos for more than 2 hours an average of 3.42 ± 2.91 SD days per week and spent 2 hours or more playing computer games on 1.21 ± 2.12 SD days weekly. Most (82%) reported that, during the past week, they had not asked parents to buy a food or drink they had seen advertised on TV. A review of the children's surveys indicated the number of days/week they watched screens or played computer games were similar across grades, ages, and geographic locations. In contrast, the 17 children from West Virginia engaged in significantly ($p=0.031$) more active play, nearly twice as many days weekly as the 13 children from New Jersey (5.27 ± 1.98 SD vs 2.77 ± 2.89 SD). Focus group findings were similar across children's age groups.

Children's active play attitudes and behaviors

Children reported engaging in both organized (e.g., team sports like basketball, soccer, track) and recreational activities (i.e., tag, bike riding, swimming, made-up games). Many of the children indicated that they "like to play with friends", cousins, siblings, and parents. Outdoor active play was identified as an enjoyable activity much more frequently than active play indoors. Kids felt that "it's fun to be active" and "it's important to play actively because your body needs some activities." The kids also recognized the health benefits of physical activity stating that "it improves your health" and it's "important because you lose weight and you don't have to worry about people bullying you." Additionally, the children noted that active play was beneficial because it "gives you a break from school work." Some children pointed out that being active "helps your body energize" and helps "get all the energy I have out".

Children's perceptions of their parents' attitudes towards active play

Nearly all of the children believed that it was important to their parents that children play actively with their friends and family every day. Children indicated that they knew their parents valued active play for their child because their parents "encourage active play" by telling them to "go outside and play" and that parents "do not want us to just play on electronics". Kids reported that their parents want them to be active so that they "get our heart pumping and blood flowing", "grow up healthy and strong" and because the child "needs to lose weight". Kids felt their parents placed importance on their children being active with others because "Parents like to see children getting along with their family and friends" and because parents want their children "to make friends" by playing with other kids.

Children's perceived barriers to active play

Barriers to active play included homework and chores, which used up many afterschool hours leaving little time for active play. Children also indicated that bedtime schedules set by parents ("My mom says I have to go to bed") limited the time they had to play actively every day. More sedentary, afterschool activities including participating in clubs, playing video games, watching TV, and playing on the phone interfered with active play. One child stated "I get distracted by my phone because I play on it too much." Kids reported they were less likely to play actively if they had "no friends to play with." Indoor active play was hampered by the presence of "fragile things in the house" that could be broken, and there being "not too much space to run around." Kids reported their parents discouraged indoor active play to be courteous to downstairs neighbors and because they "don't want me to make a mess". Bad weather (e.g., rain, extreme heat and cold) was cited most often by children as a hindrance to active outdoor play. Other factors that limited outdoor play included being called inside for a meal, "having to stay in an area where parents can see [me]", and being grounded.

Children's strategies for overcoming barriers to active play

Kids felt that "scheduling a time" to engage in active play would help them be sure that they are playing actively every day. They also mentioned that it would be helpful to "limit television time and go outside for about 2 hours" each day. Having toys that promote active play was another suggestion made by the kids. Frequently mentioned toys to promote active play include bicycles, trampolines, and basketball hoops. Kids also indicated that using YouTube to find videos of active play activities and "making up your own games" helped them stay active. Although children mentioned rain as a barrier to active play, some children stated that they "have to ask [their] parents, but sometimes they let them play in the rain." Children frequently mentioned hide-and-seek as an active activity that they could play indoors. Kids reported that having friends, siblings, or parents available at play time improved the likelihood they would play actively.

Kids thought that they could do their part in increasing active play by asking siblings and parents to play with them, asking parents to set up play dates for them, and asking parents to take them to friends' homes. Kids commented that special attention was needed to promote parent: child co-play because parents are often too busy to play. Kids suggested that parents "let kids help them do chores" to reduce their parent time doing housework and set aside "special time" to spend with their children. In addition to engaging in active play with their children, kids felt that parents could encourage their children to be active by "reminding us to play outside", "taking away kids' electronics", and "giving kids incentives for playing" actively.

Children's attitudes toward screentime limits

Children tended to think it was important to limit screentime (watching TV and movies and playing computer games) because

it “kills brain cells” and “it is bad for your eyes and vision.” The kids also felt that engaging in screentime resulted in “less time with your family” and participation in “fewer activities” (“I think we should have limited time for screentime because we need to have room for other activities in the day, like exercise and sleep”). While some children felt that watching TV could help them “learn words and stuff, so it is important”, others reasoned they could “learn more by going to school [than watching TV]”. Other kids mentioned limits set by parents as an indicator of the importance of minimizing screentime (e.g., “because I have a time limit”). Some kids were unfazed by restrictions placed on TV by parents as they preferred other activities (“I like to go outside a lot and play, so I don’t want to watch TV”). Although kids were aware of recommendations to limit screentime, some reported not adhering to screentime guidelines. “Not me. I don’t care-even though it is not recommended to watch it a lot” and “it’s ok to watch a lot of TV because it entertains you”.

Children’s perceptions of their parents’ attitudes toward screentime

When asked whether children thought it was important to their parents that kids limit time watching TV, movies, or playing video games, most children felt it was important to parents whereas a few disagreed. Those who thought parents placed importance on limiting screentime indicated that “it’s important to my parents because they care about my health”, and “they want us to be healthy”. Children also believed it was important to their parents that kids limit screentime so it is possible to “spend more time with people and not a screen” and because “they want us [family members] together more instead of sitting in front of a TV”. Children also indicated that their parents wanted them “to read more than watch TV” and have “more time to be outside”. “Every time I’m watching TV too much, she [mom] says to get up and go outside and play”.

Children also addressed their parents’ concerns about the negative effects of screentime on children’s health, particularly their eyesight and brain health. Children said that their parents warned them that too much screentime will “melt or rot your brain”, “kill brain cells”, and “shrink your brain”. Children felt limiting screentime is “very important because parents don’t want anything to happen to your eyesight if you watch too much TV”.

Children who believed their parents were not concerned about limiting felt this because they did not receive negative feedback from parents when they engaged in screentime. For example, “my parents never ask me to turn it off and go outside”, “my parents don’t care how much TV I watch-they don’t say anything when I am watching TV, they are just on their phone.” Another felt parents were too busy and tried to be concerned with children’s screentime and mentioned that parents “want to relax...TV helps them relax.” Some kids thought their parents allowed screentime because it kept children entertained, explaining that “mom lets me play video games because I am not annoying her [when I play]”.

When asked what advice they would give parents to help them be sure kids don’t spend too much time watching TV and

movies or playing computer games, children had an array of ideas. Some kids mentioned that parents should “distract” kids from screentime by “persuading them to play other games”, buy them toys or “give them money to buy stuff to entertain themselves”, “make it a fake day of Christmas or a fake birthday”, or “have a party.” Other kids mentioned setting limits or making rules related to the ratio of active play to screentime; for example, “if I was my dad, I would say 2 hours of TV; then it would be time for me to play for 2 hours.” Other kids would tell parents to “turn off the TV and stop it from working”, “not pay the TV bill”, “take the remote away and hide it”, or “take away their [children’s] toys to punish them if they watch too much TV”.

Children’s perceived barriers to limiting screentime

When children were asked what stopped them from limiting the amount of time they spent engaged in screentime, they stated “the show or series is addicting” and they “want to keep watching every day.” Kids also indicated the “suspense of the next episode” or excitement about a “new TV Show” prevented them from limiting their screentime. A few kids also mentioned using TV as a break from another activity (“When you are playing with Legos and your fingers are tired, you go to watch TV, but then you watch too much TV”). Coping with boredom was another common theme shared by the children as a barrier to limiting screentime. For instance, “watching long movies on long drives” or using screentime due to lack of other entertainment (e.g., “I don’t have that many new nice toys”, “I live in the woods. It is not fun; there is not much to do. It is boring”). Intrapersonal factors preventing kids from limiting screentime included the influence of siblings “my brothers make me watch a lot of TV” and family dynamics “I like to have a movie night with my family on Friday”. The kids also mentioned that the environment could influence their screen use, and simply having a screen in the room compelled them to engage in screentime (“TV is too tempting to not touch it” and “In my room there is a TV, so it is hard to not watch TV”).

Strategies for overcoming barriers to limiting screentime

When asked what helps them limit screentime, children named both active and inactive activities. Active pastimes included “go[ing] outside more”, “play[ing] on my bike”, “play[ing] in the park”, “training for soccer”, “throwing paper airplanes,” and “climb[ing] trees.” Passive activities included reading, playing with dolls, board games, and toys. In addition to these recreational activities, children also reported completing “chores”, “tasks I want to accomplish,” babysitting, outings (e.g., shopping), and doing things with parents as alternatives to screentime. Engaging with others was a common theme in the focus groups. The kids describe “doing something with mom”, “hang[ing] out with my friends”, “playing with my cousins down the street”, and “play[ing] with the dogs” as ways to limit their screentime. One admitted that limiting screentime occurred “when the battery dies”.

Kids believed that “parents affect how much time kids spend watching TV”. Kids rely on their parents to help them regulate

the amount of time they spend in screentime by setting “program time limits on the Kindle” and other devices, “tak[ing] away the remote and hid[ing] it”, “only letting kids watch TV on certain days”, “turning off” the screens, and “taking away” their devices. Children reported that their parents encouraged them to limit screentime by “finding what other activities kids are interested in and telling them to do that instead”. One child said, “Dad brings bikes home and balls to play with so we can do that instead of watching TV”. Kids felt that parents helped them balance screentime with other activities by “asking me to finish the episode and go outside” and establishing guidelines, such as “for every hour you watch TV you have to play an hour of sports or read”.

Some children reported limiting their own screentime without assistance from their parents by “set[ting] a timer”, “before you start watching, pick out 2 shows and something to do after”, and “saving TV watching for bedtime”. The kids, especially those with younger siblings, took some responsibility for helping their siblings limit their screentime by “telling younger siblings not to watch any more TV”, “play with them outside”, and “go do something else”. The kids also reported that siblings could have a negative effect on each other’s screentime behaviors particularly when one sibling “watches TV a lot and this makes me want to watch.” Similar interactions between siblings were reported for computer and tablet use as well, with siblings becoming “jealous” and “copying” each other.

Children also had suggestions for other strategies, perhaps less practical, that parents might consider using to help kids limit screentime. For instance, they suggested parents help kids limit screentime by telling them that “[when you have screentime] your brain is going to melt.” Another suggested parents charge children cash for “every hour they watch TV” or “not pay the TV bill”.

Children’s cognitions of television commercials

Most of the children who participated in the focus groups understood that the purpose of commercials is to “persuade you to buy something”, and that advertisers “want to sell more”, and “want to get people to go to there [store being advertised].” Other children felt that advertisements are deceptive and “are just trying to trick you” and “say the food items are a low price when they really are not.” Some thought commercials helped them “find out stuff and go to the places to buy stuff”, but others countered “commercials aren’t really important to me... nahhh.” A few children thought commercials were to give viewers a break to “do what you need to do”, like “change the channel to watch another TV show” or to “take some time from an episode”. Still others noted that the media they watched (e.g., Netflix) was commercial free.

The kids reported seeing “a lot of commercials for food” including fast food restaurants, candy, sports drinks and soda. Many kids indicated that “when you see the commercial, it makes you want that certain food or beverage”. One child remarked, “When I see the food on TV it makes my tummy rumble” and another commented, “that sound in the Coke commercial makes me thirsty and makes me want the Coke”. The kids reported that they “like to buy stuff that was shown on

TV commercials” and when “I see the kids in commercials, I want what they have”. This carries over to purchasing behaviors and “if I see it at the store I will want to try it.” However, kids realized their parents make purchasing decisions and can regulate the items they chose to buy for their children. For instance, although children “notice the commercials, I never ask because I know they won’t buy it”. Although one child indicated “So like if it is something that I want, I will sometimes ask, but my mom never pays attention to me because my mom is always on the phone on Facebook and stuff. I tell her about a cool toy, but not about food.” Another commented, “My dad usually buys it for me when I see it on TV.” The kids also understood that commercials do not always portray products accurately “and some things look great, but then you get them and it sucks”.

Most kids reported that their parents “don’t say anything about the advertisements or commercials.” Those children whose parents did talk with them about commercials stated that parents explained that many advertised foods are “bad for your health” and that “advertising doesn’t show the complete truth”. When kids asked for things they saw in advertisements, they indicated that their parents said, “You can’t get everything you want” and explained that the advertisers “just want your money”. Kids suggested that parents could help kids understand that many foods and beverages advertised on TV were not always healthy choices by telling kids these foods are “not healthy” and “a bunch of junk that you shouldn’t eat” and that kids should “eat a salad” instead.

Discussion

The study aimed to qualitatively explore the cognitions of parents and school-age children vis-à-vis active play and screentime. Recommendations for obesity intervention programs based on Social Cognitive Theory derived from this study’s data are shown in **Table 1** and discussed below. Focus group findings showed that parents considered physical activity to be beneficial both for weight management and overall well-being. Nonetheless, parents’ admission that they did not prioritize physical activity is similar to other studies reporting that many parents do not understand recommended physical activity levels [26], may overestimate their children’s physical activity level [37], or believe that physical inactivity is a concern for other families, but not their own [38]. Others have reported that parents estimate children’s physical activity level using visual cues, such as “having a lot of energy”, yet this type of estimation may be inaccurate if it is based on comparisons to an otherwise sedentary culture [26]. Inactive children also tend to overestimate their physical activity level by as much as 40 percent [37]. Education programs that emphasize recommended targets for daily physical activity and how to distinguish between various levels of activity intensity (e.g., moderate, vigorous) may help build parent awareness of children’s physical activity needs and increase their accuracy in assessing children’s physical activity levels.

As in other research [39], parents in this study cited lack of time as a key reason their families failed to engage in regular physical activity. However, an investigation of 291 parent-child dyads reported that of the 233.6 ± 80.0 SD minutes per day

spent together, only 2.4 ± 40.1 SD minutes daily were spent in moderate-to-vigorous physical activity whereas 92.9 ± 40.1 SD minutes per day were spent in leisure sedentary pursuits [40], suggesting that how families allocate their time together may play a greater role than lack of time. Providing parents with strategies for prioritizing time for physical activity, along with teaching them advantages it offers to family physical and mental health and bonding [41,42], could better facilitate achievement of an hour of physical activity daily [43].

Among elementary school children, time spent watching television increased with age while daily physical activity declined, indicating that screentime may displace physical activity especially as kids get older [44-46]. Further complicating control of screentime is that parents feel children's exposure to electronic devices is important to prepare them for the workforce, help them fit in with peers, and for homework assignments [47]. This dichotomous view of sedentary media (i.e., it supports learning but displaces physical activity when used for leisure) makes it difficult to send clear messages about appropriately allocating time to media and has prompted discussions about updated recommendations for best practices for balancing educational media use with guidelines for leisure screentime and physical activity [48,49]. Acknowledging the usefulness of sedentary media for work and educational purposes while demonstrating how leisure screentime competes with physically active pursuits, perhaps through use of a journal or activity tracking device, may help parents balance and reap the benefits of both sedentary media and physical activity.

Like other research [39,50-52], parents in the present study reported difficulty limiting children's screentime for numerous reasons, including lack of energy for arguing with children, children watching TV in their bedrooms after bedtime, and bad

weather inhibiting outdoor activities. A greater number of parental perceived barriers to limiting children's screentime are associated with increased risk of childhood overweight and obesity [50]. Helping parents develop a repertoire of strategies for limiting screentime as well as build the self-efficacy to regularly implement these strategies is of particular importance given the possible associations between the likelihood of children being overweight and parental perceived barriers to limiting screentime and promoting physical activity [51,53].

Parents in this study believed that modelling of physical activity and co-play would positively influence children's physical activity. However, the perceived importance of co-play declined as children reached elementary school. Although qualitative research exploring associations between parent-child physical activity patterns has yielded mixed results [54], quantitative results of the CANPLAY study in Canada showed clear relationships between daily step counts of parents and their children [23]. Beyond providing an example for their children to model, parents also give encouragement, facilitate transportation and equipment purchases and devote time to their children's activities; thus, their effect on child physical activity is likely multi-faceted [55,56]. The availability and accessibility of space and supports for physical activity both inside and outside the home positively correlate with children's physical activity levels [9,56,57]. Likewise, parents realized that modeling screentime behaviors also impacted their children, an important realization given that among families in Germany, increased parental television viewing (>60 minutes/day) raised the odds of higher amounts of television viewing among their children [58,59]. Efforts to remind parents of the effects of their role modeling and desires for positive health outcomes for their families may facilitate greater family activity over inactivity.

Table 1: Recommendations for Future Interventions Aiming to Improve Physical Activity and Screentime Behaviors in Families with School-Age Children

Activity and Screentime Behaviors in Families with School-Age Children	
Construct	Social Cognitive Theory Recommendations for Future Interventions Aiming to improve Aiming to Improve Physical Activity and Screentime Behaviors in Families with School-Age Children
Outcome Expectations	Expand PA outcome expectations to include improved mental health and family bonding
Outcome Expectations	Improve parent understanding of the benefits of PA supports (i.e., toys and games) inside and outside of the home
Outcome Expectations	Acknowledge the usefulness of sedentary media for work and educational purposes while demonstrating how leisure ST competes with physically active pursuits
Facilitation	Teach parents strategies for prioritizing time for PA
Facilitation	Promote parent: child planning to substitute sedentary, solitary activities with physical activities that are fun and build interaction (e.g., gardening together, taking pets for a walk together, home improvement painting project outside)
Facilitation	Help parents develop a repertoire of strategies for limiting ST
Facilitation	Provide strategies for restructuring the home environments to support the reduction of ST
Facilitation	Improve parent skill set for accurately estimating children's PA level
Self-Efficacy	Promote parental self-efficacy for regularly limiting children's ST
Observational Learning	Reinforce the importance of parent role modeling on child PA and ST behaviors

A variety of strategies helped parents to successfully regulate screentime for their families, and many acknowledged that

making television less accessible by removing it from children's bedrooms or moving it out of the main area of the house was

helpful. Similar findings have been reported by Maitland and colleagues [60]. Their review of literature on the influence of the home environment vis-à-vis media use noted positive associations between bedroom media equipment and sedentary activity such as television viewing [60]. Strategies for restructuring home environments could support natural, “default” behaviors that result in reduced screentime.

In the current study, focus groups with children found that kids enjoyed playing with parents, despite parent perceptions that co-play was less relevant for older children. Like their parents, children identified lack of time due to competing activities such as homework, indoor space constraints, and bad weather as barriers to active playtime. Children, as well as parents, also believed that having active play equipment would be helpful. Indeed, 10-year-olds from multiple countries reported higher levels of moderate-to-vigorous physical activity when they owned more play equipment [9]. These findings suggest possible targets for interventions that promote family physical activity, provide ideas for active indoor games, and encourage parents and children to collaboratively make plans and set goals for physical activity. In addition, gaining an awareness of physical activity supports children believed were effective could help parents facilitate children’s access to these supports.

The variety of barriers to limiting screentime reported by children in this study mirror those reported by Canadian parents [61]. Children also described limiting their own screentime and acknowledged they could play a role in limiting it. This finding indicates that younger children also may benefit from programming similar to that which enabled 12 to 14 year old boys to improve their personal motivation and/or desire to limit screentime [62]. Most children agreed with parents that limiting screentime was important and correctly identified its ability to crowd out exercise and sleep.

Conclusion

The qualitative data generated in this study are rich, instructive, and reached the data saturation point. This is among the first studies to qualitatively analyze both parent and children’s physical activity and screentime cognitions. School-aged children are starting to make many independent decisions about their health and well-being yet remain dependent on parents. Hence, gaining insight into the attitudes, perceived barriers, and facilitators of both groups is critical to informing the development of interventions targeting improved physical and screentime behaviors as a means for preventing childhood obesity. Future investigations should examine the effectiveness of incorporating the findings of this study and recommendations in **Table 1** in improving physical activity and screentime behaviors in families with school-age children.

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