Research Paper

The Influence of Screen Time on the Acquisition of Language Skills: A Preliminary Study

Vrinda R[1*], Abhilasha Wilson[1], Thazlima Nizar[1]

1. Department of Neurodevelopmental Sciences, National Institute of Speech & Hearing (NISH), Trivandrum, India.

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ABSTRACT

Objectives: This study aimed to understand the screen time activities of toddlers and their parents, the relationship between toddlers' screen time and socioeconomic status (SES), the relationship between toddlers' screen time and language skills, and the screen time restrictions set by their families.

Methods: The participants comprised 33 typically developing toddlers aged 12-24 months and their parents. Informed consent was obtained from the parents of all participants who passed the screening. Children's and their parents' screen time activities and other leisure activities, the family's SES, and receptive and expressive language scores were assessed.

Results: A total of 96.9% of children had a mean screen time of 750 minutes per week, equivalent to 1.8 hours per day, which is significantly higher than the recommended guidelines. Children were mostly exposed to smartphones and televisions. Nine children did not meet age-appropriate language scores, and all other children had age-appropriate language scores despite having excess screen time. No significant correlation was found between language scores and screen time in children and parents. A positive correlation was found between parents' screen time and SES, but not between children's screen time and SES.

Discussion: This study highlights the significance of co-viewing and interactive screen time in supporting the development of language skills. It also highlights the need to revise guidelines on screen time restrictions in young children. Guidelines should include recommendations in choosing high-quality, age-appropriate strategies to encourage co-viewing to enhance parent-child interaction. The paper also emphasizes the significance of restricting parents' screen time as it may interfere with qualitative interactions with the child leading to language delay.

*** Corresponding Author:**
Vrinda R
Address: *Department of Neurodevelopmental Sciences, National Institute of Speech & Hearing (NISH), Trivandrum, India.*
Tel: *+91 (97) 44684800*
E-mail: *vrinda@nish.ac.in*

Highlights

- The detrimental effects of screen time on language development are lessened by interactive screen time, which includes co-viewing and engaging in sufficient verbal interactions.

- Passive, non-interactive screen time should be completely restricted, as it provides fewer or no opportunities for the child to initiate or engage in social conversation and learn language.

- This study highlights the need to revise guidelines on screen time restrictions for young children. Guidelines should include recommendations for choosing high-quality, age-appropriate strategies to encourage co-viewing to enhance parent-child interactions.

Plain Language Summary

The most influential component essential for children's language development is parent-child interaction. The quality of parent-child interactions positively influences child responsiveness and contributes to the development of language and literacy. Screen time often interferes with parent-child interactions, leading to one-sided, passive screen time. This hinders a child's language development, as it offers little to no opportunity for social interaction. In the present research, it was found that children had age-adequate language skills, despite having excessive screen time, particularly for those children whose parents spent quality time explaining and interacting with them regarding the programs on TV. This finding suggests the need to increase awareness about the impact of passive screen time on language development. Parents should practice interactive screen time by explaining and engaging in conversations while using screens. This will increase parent-child interaction and facilitate language development. Although interactive screen time supports language development, screens have their limitations; therefore, whenever possible, screen time should be avoided.

Introduction

Screen time refers to the amount of time spent watching or using a screen device, such as a computer, gaming console, DVD player, or television [1]. Due to technological advancements, the use of gadgets in developing children has increased. These gadgets are now a necessary component of their everyday lives, reducing their interaction with others. Researchers have proven that this increased screen time can lead to poor behavioral and cognitive outcomes in children's development. These children are at a high risk of language delays [2]. A child's language development greatly depends on parent-child interaction and relationships. Parents are the primary individuals who consistently engage and interact with infants. To shape a child's reading environment and language development, parents' good interactions with their children and their improved responsiveness are crucial [3].

According to Kirkorian et al. background television interferes with parent-child interactions by diverting parents' attention to the television and preventing social input and parent engagement [4]. Parental interactions with young children have significantly reduced due to the increased use of screens by parents. Parent-child interactions may be less effective if a parent is using a screen since they may be less receptive to their child's verbal and nonverbal cues for attention [5]. Excessive screen use by parents results in a lack of parent-child interaction, thereby affecting language development in young children. Studies have also shown that excessive screen viewing by parents is strongly associated with young children's screen time [6].

Research has revealed that children who view over two hours of television before 12 months of age have a six-fold increased risk of experiencing a language delay [7]. In a study by Duch et al. the screen media use, content, and language development of 119 Hispanic infants and toddlers were evaluated. It was found that children who watched more than two hours of television a day had low communication scores [8]. Byeon and Hong conducted a similar study in Korea to investigate the link between toddler language delay and television viewing. The results showed that children who watched television for more than three hours were three times as likely to experience language delays [9]. Another study reported that 20% of children had an average of 28 minutes screen use per day by the time they were 18 months old [10]. In a study conducted by Hill et al. 120 36-month-old

children, either with no family history of attention-deficit/hyperactivity disorder or autism spectrum disorder (ASD) or with a family history of both conditions, were examined regarding their language development, behavioral outcomes, and use of video-based media. The results indicated a correlation between lower receptive and expressive language scores and increased screen time [11]. Fitzpatrick et al. conducted a cross-sectional study on Canadian preschoolers to understand digital media use. The study revealed that more than 2 h of digital media were used per day during the COVID-19 pandemic, and 56% of the children were also exposed to media before bedtime [12].

According to a cohort study reduced parent-child play in early life and increased screen time have been associated with later ASD-like symptoms [13]. Preschoolers are more likely to exhibit autistic behaviors when exposed to screens at a young age [14]. TV exposure during family meals and background TV viewing are consistently linked to lower verbal intelligence quotient (IQ) and language scores [15].

According to the Indian Academy of Pediatrics (IAP) guidelines on screen time [16], children under two years old should not be exposed to screens at all. For children aged 24-59 months, exposure should be limited to no more than one hour of supervised screen time per day, and for children aged five to ten, to less than two hours [16]. The American Academy of Pediatrics proposed similar guidelines (AAP, 2020) [17]. Except for video chatting, the AAP recommends that children aged 2-5 have no more than an hour of screen use per day.

In India, the relationship between screen time and child development has been examined in only a small number of prior population-based studies. According to a study reported from Kerala, children who spent their screen time unsupervised were far more likely to have suspected deficiencies in attention, cognitive, language, and social skills [2]. A survey conducted among 200 parents in Kerala indicated that awareness of the impact of screen time on toddlers' communication skills is low, and it is required to raise awareness among the public [18]. A study conducted by Varadarajan et al. examined the correlation between developmental delay and excessive screen time in children under the age of five. The results showed that excessive screen time was highly prevalent and had a substantial impact on children's development [19].

Recent studies have shown that better quality, appropriate, and interactive screen time is associated with stronger language skills [20]. Co-viewing media increased the amount of new words used per utterance when parents spoke to their children about the program [21]. Mothers who co-viewed educational TV shows with their 14-month-old children showed improved language outcomes compared to those who did not [22]. Interactive screen time refers to the parent or caregiver spending quality time on quality content, co-viewing, and engaging in interactions with the child that are beneficial for language acquisition. Interactive screen time increases parent-child interaction, exposing children to a language-rich environment, which in turn fosters the development of strong language skills. One of the major factors that contribute to language delay in children exposed to excessive screen time is a lack of social interactivity [23]. Roseberry et al. have shown that younger children learn new words from videos and screens only when accompanied by live social interaction, whereas older children can learn from videos alone [24].

Compared to families with a higher socioeconomic status (SES), parents with a lower SES tended to watch TV or DVDs with their children more frequently. Children from higher socioeconomic backgrounds utilized technology more frequently and in excess of recommended limits. [25]. Children at the lower end of the SES range typically receive significantly less high-quantity and high-quality language exposure, which impacts their language, grammar, and vocabulary development [26].

Need for the study

With the restrictions imposed by the COVID-19 pandemic, screen time has increased for everyone, including young children. Although studies have proven that excessive screen time leads to language delay, the practice of screen time varies across different cultures. Recent evidence reveals that a lack of interactivity during screen time hinders children's language development. The quality and quantity of interactions during screen time may influence language development. Previous studies on screen time had mostly considered the quantity of screen time, and little is known about the effect of interactive screen time. Therefore, there is a need to examine the quantity and quality of screen time activities among children and parents, and understand how they are related to language development.

Objectives

To understand the screen time activities of toddlers in the age range 1-2 years: Duration, type of screen, and age of active screen time.

To understand the relationship between screen time and language skills in toddlers. To understand the screen time practices of parents: Their own screen time, interactive screen time, and their relationship with their ward's language skills, as well as the reasons for providing screen time. To understand the relationship between screen time and family SES. To understand the screen time restrictions set by the family.

Material and Methods

The participants were 33 typically developing toddlers aged 12-24 months and their parents. The children's screen time activities and other leisure activities, family SES (using the modified Kuppuswamy scale), and receptive and expressive language scores (using the assessment of language development (ALD) tool) were assessed.

Procedure

The researchers disseminated information about the study's conduct through friends and family. Thirty-seven participants were initially identified. Before enrolling parents and their wards in this study, an informal screening was conducted to determine the inclusion and exclusion criteria. Participants were enrolled based on the following inclusion criteria: Full-term gestation, a native Malayalam-speaking household with no history of developmental delay, and normal vision and hearing sensitivity. The inclusion criteria included parents of families settled in Kerala who spoke Malayalam as their primary language and had no significant concerns related to sensory ability. Informed consent was obtained from all participants. The questionnaire on 'screen time' [23] was sent to participants who had passed the screening via Google Forms. Of the 37 participants, four failed to respond to the questionnaire. Each participant was contacted individually online. Modified Kuppuswamy socioeconomic scale [27] was used to determine the family's SES. Kuppuswamy's SES scale for each family was identified by calculating the total score. The receptive and expressive language scores of 30 children were assessed using the ALD [28] in both online and offline modes. The received responses were tabulated, and appropriate statistical analyses were performed. Categorical and quantitative variables are expressed as frequencies (percentages) and Mean±SD, respectively. Descriptive statistics, such as Mean±SD, median with interquartile range, and minimum and maximum values, were used to describe screen time. The relationship between quantitative parameters was determined using the Karl Pearson correlation coefficient. For all statistical interpretations, $P<0.05$ was considered the threshold for statistical significance. SPSS software, version 20 was used to conduct analyses.

Results

The participants were 33 children, aged 12-24 months (16 girls and 17 boys), with a mean age of 16.7±3.7 months, and their parents. Table 1 presents the participants' demographic details. For most participants, mothers (63.3%) were the primary caregivers. Of the 33 participants, 3% (n=1) had been attending daycare for approximately 1 year, 9.1% (n=3) for less than 6 months, and 6% (n=2) reported having screen-based activities in daycare for two hours.

Screen time activities of children

Table 2 presents the screen time activities of children. Many parents (54 %, n=18) reported that their toddlers began actively watching screens from one to two years of age, and 36.4% (n=12) started before the age of 1. Televisions and smartphones were the most commonly used gadgets. The background screen was not present for 39.4% (n=13) of participants and 45.5% (n=15) reported that the television was occasionally turned on in the background.

Analysis of the screen time revealed that one child did not have any screen time while 32(96.9%) had a mean screen time of 750±751.8 minutes in a week, that is 1.8 hours per day, with an average television screen time of 620 minutes a week, laptop or desktop computer screen time of 504 minutes a week and 385.5 minutes per week of the smartphone screen (Table 3).

A few parents (30.3%, n=10) reported spending some qualitative time explaining or educating their child about the characters in the program while watching the screen, and 42.4% (n=14) encouraged conversation with their children while using the screen.

Time spent on outdoor games by children revealed that 39.4% (n=13) of children spent more than two hours, 24.2% (n=8) for one to two hours, 21.2% (n=7) for half to one hour, and 15.2% (n=5) responded that their children spent less than a half-hour on outdoor games per

Table 1. Demographic characteristics of the participants

Variables		No. (%)	Mean
Age of child (m) (n=33)	12-18	17(51.5)	16.7
	18-24	16(48.4)	
Gender	Male	17(51.5)	-
	Female	16(48.4)	
Father's age (y)	21-30	9(28)	34.2
	31-40	22(68.7)	
	41-50	1(3.1)	
Mothers age (y)	21-30	21(63.6)	29.5
	31-40	12(36.3)	
SES	Upper class	5(15.2)	-
	Upper middle class	15(45.5)	
	Lower middle class	13(39.4)	
Primary caregivers	Mother	21(63.6)	-
	Father	0	
	Both parents	7(21.2)	
	Grandparents	5(15.2)	

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day. Parents reported that most children (97%; n=32) enjoyed playing with other children, and most of them had the opportunity to play with their siblings (54.5%; n=18) or with their neighborhood friends (21.2%; n=7) daily. A few children (18%; n=6) did not have any neighborhood friends.

Screen time practices of parents

Table 4 presents the screen time practices of parents. Smartphones were the most commonly used gadgets by parents. An average total screen time of 372.9 minutes (approximately 6.215 hours per day) was observed in parents, with a standard deviation of 280.3 minutes (approximately 4.7 hours per day). Table 5 presents the parents' daily interaction time with their children in minutes. An average of 436 minutes (approximately 7 hours) was spent on parent-child interaction with a standard deviation of 248 minutes (approximately 4.1 hours) per day.

Screen time and language skills

Of the 33 participants, 9 children did not meet the age-appropriate score criteria of ALD, indicating a delay in both receptive and expressive language skills. All other children met the age-appropriate score criteria. Qualitative analysis showed that these children had excess screen time, except for one child reported zero screen time. Also, parent-child interaction was relatively poor for children who did not meet the ALD criteria compared to those with age-appropriate language skills. Upon further investigation of the child with zero screen time, it was found that the child had been exposed to active screen time from the age of 6 months. Recently, the parents became aware of the impact of screen time and restricted it.

Table 6 indicates the correlations between screen time, SES, and language scores. The Karl Pearson correlation coefficient was used to determine the correlation between screen time, SES, and language scores. A positive correlation was found between parents' screen time and

Table 2. Screen time activities of toddlers

Variables		No. (%)
Type of devices used by the children	Television	21(63.6)
	Laptop/desktop computer	5(15.2)
	Smartphone	21(63.6)
	Others	2(6.1)
Age of initiation of active screen time	0-6 months	1(3)
	6-12 months	12(36.4)
	1-2 years	18(54.5)
Presence of background screen	Always	0
	Most of the time	0
	Sometimes	15(45.5)
	Hardly ever	5(15.2)
	Never	13(39.4)

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SES. However, no statistically significant correlation was found between the receptive language score, the expressive language score, the screen time of children, and the screen time of parents. Also, no significant correlation was found between the screen time of toddlers and the family's SES.

Awareness of guidelines and impact of screen time

Many parents (n=20; (60.6%) reported that they were aware of the guidelines on screen time for children. Table 7 presents the reasons for screen time use. The most prevalent justification for allowing screen time was that the child enjoyed it (57.6%). Some parents believed that screen time would help their children develop language and literacy skills (36.4%).

Most parents (75.8%; n=25) were aware of the impact of increased screen time on their children. Table 8 presents the impact of screen time on children, as pointed out by the parents. Vision problems (48%) and socialization issues (44%) were the most commonly mentioned impacts. Only a small percentage (20%) of parents mentioned delays in speech and language development as an impact of increased screen time. The least reported problems were behavioral issues and reduced play skills. Table 9 presents the screen time restrictions set by parents to restrict their children's screen time. Of the participants, 63.6% (n=21) reported having set restrictions on their children's screen time, while 39.4% (n=13) had not set any restrictions.

Table 3. Descriptive analysis of total screen time per week of children in minutes

Variables	Mean±SD	Median	Min	Max
Total TV time	620.2±473.8	420	70	1680
Total lap time	504±435.5	420	210	1260
Total smartphone time	385.5±449.1	240	0	2100
Other gadgets time	375±233.3	375	210	540
Total screen time	750.7±751.8	420	0	3360

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Table 4. Type of devices used by parents and descriptive analysis of total screen time per day of parents in minutes

Variables	Screen Time Practices of Parents		Median	Min	Max
	No. (%)	Mean±SD*			
Television	19(57.6)	89.1±65.1	60	2	240
Laptop	15(45.5)	292.5±206.5	210	60	660
Smartphone	31(93.9)	179.8±103.8	180	10	540
Other	3(9.1)	120±60	120	60	180
Total screen time	-	372.9±280.3	360	0	1110

*Mean screen time (minutes)

Table 5. Parent's interaction time with children during a day in minutes

Variables	Mean±SD	Median	Min	Max
Talking while engaging in daily routines	188.7±141.6	145.7	0	531.4
Narrating stories and describing things	120.6±85.2	120	15	360
Playing with the child	121.2±93.6	94.3	0	420
Others	47.1±17.7	55.7	17	60
Total time	436.7±248.5	360	60	1088.5

Discussion

This study examined both the quantity and quality of screen time activities of both children and parents and their relationship with language and SES. The average screen time for children in this study was substantially greater than the suggested standards issued by several agencies, such as the AAP [17] and the IAP [16], which recommend that no screen time be allowed until children are two years old. The concept that watching television would replace necessary and significant parent-child interaction was the primary basis for the recommendation. A 2011 report from Canada revealed a mean screen time of 104 minutes per day [29], and the use of digital media surged to more than 2 hours during the COVID-19 pandemic [12]. Reports from Chennai, before COVID-19 pandemic, revealed a mean screen time of 2.39 hours per day [19]. The constraints imposed by the COVID-19 pandemic outbreak increased screen time for young children [23]. Compared to previous reports, the mean screen time was lower for children in the present study. However, the standard deviation was very high. Removing the outliers resulted in a higher mean screen time for children. Also, the sample size in the present study was small. Increasing the sample size would provide a more comprehensive understanding of the screen time practices of children and parents. Smartphones and TVs were the main media through which children were exposed. Research from countries, such as Saudi Arabia [30], Korea [31], and India [19] has revealed similar results.

Table 6. Correlation between screen time, SES, and language skills

Variables	r (P)		
	Receptive Language	Expressive Language	SES
Screen time of children	0.113 (0.531)	0.12 (0.506)	-0.187 (0.298)
Screen time of parents	0.162 (0.368)	0.085 (0.636)	0.418* (0.0154)

*Significant at 0.05 level.

Table 7. Reasons for providing screen time

Reasons for Providing Screens	No. (%)
Because the child finds it very enjoyable	19(57.6)
To help them develop language and literacy skills	12(36.4)
It is easy to feed the child while watching the screen	9(27.3)
To keep the child engaged during work	9(27.3)
Easy to manage the child and make parenting easy	5(15.2)

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Table 8. The impacts of screen time, listed out by the respondents, and the percentage of responses

Impact	No. (%)
Vision problems	12(48)
Socialization issues	11(44)
Speech and language delay	5(20)
Attention issues	5(20)
Medical issues	5(20)
Brain damage	4(16)
Developmental problems	2(6)
Reduced play skills	1(4)
Behavioral issue	1(4)

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In this digital era, many daycare programs incorporate various activities that involve screen time. In the present study, an average of 2 hours of screen time per day was observed in the daycare, which is higher than the average screen time of 76 minutes per day reported in the literature [32]. This indicates the need to raise awareness among authorities regarding the impact of passive screen time on children. In the present study, the type of screen-based activities in daycare was not considered. An in-depth examination of the type of screen activity in daycare centers is needed, as technological advances in the digital era are being integrated into the preschool education system.

Active screen time was initiated before the age of two years for the majority of the participants and 36.4% started even before 12 months. Another report from India [19] also reported that 69.3% of children were ex-

Table 9. Restrictions set by the parents to restrict screen time

Restrictions	No. (%)
Limit total screen time each day	12(36.4)
Set days when no screen time is allowed	7(21.2)
Have screen-free times for the whole family	5(15.3)
No restrictions	13(39.4)

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posed to screens before 12 months of age. Studies from other countries, such as Korea [31] and the US [33], have also shown that many children are exposed to screens before the age of two. Language delays were six times more common in children who watched more than two hours of TV before their first birthday [7]. These results indicate that the age of initiation of screen use is very early in young children, and the chances of a delay in development are high. This emphasizes the need to spread awareness among parents through primary healthcare workers, nurses, doctors, and other professionals as early ages are the critical years for brain development. A direct relationship was observed between the screen time duration and age. As children grow older, their screen time increases [34]. Hence, there is a potential for the screen time of the participants to increase as they grow older. Immediate action is needed to restrict screen time, as all participants had excessive screen time. Future studies with the same participants will help us understand the pattern of screen time practices and their influence on various domains of child development as the children grow older.

The present study could not be established a statistically significant correlation between children's screen time and language skills. Although high screen time was present for all children, only nine children had inadequate scores in both receptive and expressive language. This could be due to the small sample size of the study. Previous studies have clearly stated that excessive screen time can lead to delayed language development [2, 7, 9, 15, 19]. Passive non-interactive screen time is always one-sided and does not elicit a response from children [23]. Also, there is a strong likelihood that parent-child interactions will decline as screen usage increases [35]. A relatively reduced parent-child interaction was observed in the present study in children with language delays. This highlights the critical role of parent-child interaction in helping young children develop their language skills. According to studies, children who are exposed to screens before the age of 3 years might have an increased risk of autistic-like behaviors. These children improved significantly when their parents reduced their screen exposure for a few months, which was related to daily periods of dyadic interactions [14]. These reports highlight the importance of restricting screen time and the necessity of engaging in qualitative parent-child interactions. Hence, parents in the present study should be informed about the need to restrict screen time and spend quality time with their children. They should be closely monitored for their children's communication skills. It has been found that 12- and 24-month-old children's sustained toy play is disrupted by background television viewing. Compared to the interactions between parents and children when the television is turned off, background television reduces the quality and quantity of parent-child interactions [4]. Background television was consistently associated with lower verbal IQ and language scores [15]. However, in the present study, the presence of background screens was not remarkable.

Twenty-four participants in the present study had age-appropriate language skills despite having excess screen time. This could be due to several factors. The foremost reason is that parent-child interactions are relatively more common among these participants. Parents spent quality time explaining and educating their children about the characters in the program they were watching, and encouraging conversation with them while watching screens. This result is consistent with previous studies, which state that co-viewing media increases the number of novel words used per utterance when parents speak to their children about the programs [21, 22]. According to recent research, children's language development is hampered by a lack of interaction during screen time, rather than by observing the screen [23]. Appropriate interactive screen time increases parent-child interaction, and the child is exposed to a language-rich environment, leading to good language skills. In addition, these participants had opportunities to interact and play with their siblings, neighbors, and friends. This finding is consistent with the previous reports which states that children engaging in peer interaction were positively associated with children's development of receptive and expressive language skills [36] because language learning takes place within the framework of social interaction [37].

Only language skills were considered in the present study. But increased screen time has many detrimental impacts, including reduced social skills [20] and attention issues [38, 39]. Further studies incorporating all these domains will provide a holistic understanding of how screen time influences a child's overall development.

Restricting parents' screen time can serve as an excellent model for their children, as research has indicated a substantial correlation between parents' screen time and that of young children [6]. Excessive screen use by parents results in reduced parent-child interaction, thereby leading to the language development in young children. By restricting their own TV viewing and computer use, adults, including parents, grandparents, and other caregivers, can influence children's screen time [40].

No correlation was found between screen time of children and SES in the present study. This result is inconsistent with the previous literature stating a positive relationship between screen time activities in children and SES [25, 41], indicating similar screen time practices in children from all SES. All participants in the present study belonged to the lower-middle, upper-middle, or upper class. Future studies, including participants across all SES, may provide a better understanding of the influence of SES on screen time practices. Also, a positive correlation was found between parents' screen time and SES. As the chances of reduced parent-child interaction increase when parents' screen time increases, this finding should be noted with caution.

In this study, screens are provided to children primarily because they find them enjoyable. This suggests that screen time may not always be educational. The other reasons mentioned were that it was easy to feed, kept the child engaged, and was easy to manage, making parenting easier. Similar reasons have been cited in previous studies [42, 18]. It has been proven that among healthy-weight youth, increased screen time leads to increased energy intake [43]. By providing a screen while feeding, parents divert their children's attention from food while they eat. This could result in increased energy intake, leading to obesity. Therefore, feeding children in front of screens is not recommended.

Parents seem to be more aware of the vision problems associated with increased screen time, as it was the most frequently reported impact by participants in the present and previous studies [18]. Children who use screens for a prolonged time may develop myopia [44]. Most parents did not well understand the effect of screen time on speech-language and communication skills. This finding is consistent with a previous study by Reji and Sanjeevan [18]. In a prior study, the participants who were aware of the effects of increased screen time on toddlers were primarily medical professionals or speech-language pathologists. The same trend was observed in the present study. While most parents are aware that excessive screen time affects their children's overall development, only a few are aware its effects on language development. Many parents believe that watching educational videos or cartoons on screens will help their children learn to talk. Earlier research has shown that very young children, particularly those under 30 months old, do not acquire language through screen time [8]. Older children may pick up new words by simply watching the screen, but younger children can learn new words only when supported by social interaction with adults [24]. Vrinda et al. offered suggestions on how to engage in screen time in a productive way [23]. The detrimental impacts of screen time on language development may be lessened with interactive screen time, which includes co-viewing and sufficient language interaction. Therefore, parental awareness of the effects of passive screen time on language development must be raised.

Awareness of screen time guidelines needs to be increased. Compared to the reports by Reji and Sanjeevan [18], a slight improvement in the percentage of parents aware of the guidelines on screen time for children was observed in the present study. Guidelines for limiting screen time were developed by the AAP and the IAP. Due to a lack of awareness, effective screen time restrictions are not implemented, and some parents have not imposed any restrictions. Current screen time standards primarily focus on the quantity of screen time. There is no discussion of qualitative interactive screen time. As the study's results show, interactive screen time balanced with qualitative parent-child interactions can diminish the impact of screen time on language development. Therefore, policymakers should revisit the guidelines and make appropriate modifications, considering the benefits of co-viewing and interactive screen time. Since the world becomes increasingly digitally connected, it is essential to teach children how to use technology to their advantage. Straker et al. [45] emphasized the need for clear and balanced information about appropriate digital technology practices for professionals working with young children so that they can benefit from digital technology use while minimizing the potential for harm. Vrinda et al. [23] also recommended revising the screen time guidelines to include suggestions for parents of young children to choose high-quality, age-appropriate content, as well as strategies to encourage co-viewing and enhance parent-child interaction.

Conclusion

This study highlights the importance of co-viewing and interactive screen time in supporting the development of language skills. It also highlights the need to revise guidelines on screen time restrictions in young children. Guidelines should include recommendations for choosing high-quality, age-appropriate content and strategies to encourage co-viewing to enhance parent-child interactions. This study also emphasizes the significance of restricting parents' screen time, as it may invade qualitative interactions with the child, leading to language delay. A lack of awareness of the negative consequences of screen time on language development may exacerbate this problem. Therefore, it is time to raise awareness among parents about the impact of passive screen time

on language development. While interactive screen time is beneficial for language development, it is essential to note that screens have their restrictions, and excessive screen time can have numerous negative impacts. Therefore, screen time should be avoided whenever possible.

Limitations and future directions

The participants were restricted to a small geographic area; further studies, incorporating a large sample size and covering a wide range of geographic areas, may lead to more opportunities for generalizing the results. Future studies with the same participants may help provide a clearer understanding of the patterns of screen usage as age progresses and its association with language skills. Screen time and related activities were measured using parent-reported questionnaires, which subjective and biased parental responses may influence. A different method, such as maintaining a diary to record the screen time practices over a particular period, may reduce recall bias. The effect of screen time on language skills was only investigated. Future studies considering other developmental domains will provide a holistic understanding of the effect of screen time on a child's development. Circumstances, when the screen is given and barriers to restricting screen time are not considered. Identifying the reasons for and barriers to interactive screen time has strong implications to encourage and support interactive screen time and parent-child interaction.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Review Authority for Research Committee at National Institute of Speech and Hearing (NISH) (RAR ID: NISH187536), Kerala, India.

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Authors' contributions

All authors contributed equally to the conception and design of the study, data collection and analysis, interpretation of the results, and drafting of the manuscript. Each author approved the final version of the manuscript for submission.

Conflict of interest

The authors declared no conflict of interest.

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