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Original Article

Correlation Between Intensity of Screen Time To Aspect Receptive Language Development on Toddlers At Dinoyo Public Health Center

***[1]Annisa Hasanah, [2]Nadika Zahrany, [3]Rahayu, [4]Bragastio Sidharta**

[1]Pediatric Department, Faculty of Medicine, University of Muhammadiyah Malang
[2]Medical Department, Faculty of Medicine, University of Muhammadiyah Malang
[2]Pediatric Department, Faculty of Medicine, University of Muhammadiyah Malang
[3]Neurologist Department, Faculty of Medicine, University of Muhammadiyah Malang
[4]Ophthalmologist Department, Faculty of Medicine, University of Muhammadiyah Malang

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Corresponding Author:
dr. Annisa Hasanah, Sp. A, M. Si.
Mailing address: Jl. Bendungan Sutami No.118A, Malang 65145, Indonesia. Department of Pediatric, Faculty of Medicine, Muhammadiyah Malang University. **Email:** nisa.dr28@gmail.com

Abstract

Background: Screen time exposure have an impact to children's speech delay. Children's speech delays occur when they do not reach age-appropriate communication levels or have inappropriate speech patterns. One of factors causing this delay is related to exposure to electronic media screens (screen time) that is too long or excessive. Excessive exposure can have an impact, one of which is on the development of receptive language in toddlers.
Aim: To determine the suitability of the relationship between the intensity of exposure to electronic media screens and aspects of receptive language development in toddlers at the Dinoyo Community Health Center, Malang City.
Method: There were a questionnaire regarding the intensity of exposure to electronic media screens and CLAMS (Clinical Linguistic Auditory Milestone Scale) that would be answered by parents or the guardians of these toddlers with aged 1-36 month. Data was analyzed using SPSS software.
Results: Toddlers exposured to electronic screen media (screen time) on receptive language development in toddlers aged 1-36 months at the Dinoyo Community Health Center in Malang City were not have a relation or very low correlation (r = 0.061).
Conclusion: Our study suggests there is no corellation between screen time and language delays, as other factors play a role. Adhering to AAP screen time guidelines may help reduce delays in children's language and speech development.

INTRODUCTION

Several countries in the world are facing health issues related to speech and language development disorders in children. The prevalence of these issues ranges from 8-12% in preschool-aged children and 12% in school-aged children in the United States and Canada, with a previous incidence of 8.04% in Canada in 2017[1]. In Spain, 50-70% of children experience late bloomers[2]. A hospital-based study in Lahore, Pakistan, found that 46.5% of children experienced speech delays[3]. According to the Basic Health Research (Riskesdas) data reported to the Ministry of Health of the Republic of Indonesia, 16% of toddlers in Indonesia are detected with developmental disorders, hearing impairments, intellectual deficiencies, speech delays, and among them, children aged 60 to 72 months are in the preschool age category and are suspected to have developmental delays [4].

In 2010, the Indonesian Ministry of Health (KEMENKES RI) stated that 11.5% of toddlers experience growth and language development disorders[5]. A report on health service practices in 2014 recorded cases of speech and

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language delays in Indonesia ranging from 2.3-24.6% across all age categories, with around 5-10% in the preschool category[6]. Parents of children with speech delays experience increased anxiety, with 69 parents expressing concern, including 10 experiencing high levels of anxiety[7]. Children with language developmental delays at age 19 or adulthood may experience social anxiety or anxiety related to social activities, impacting them until the age of 31[8].

One factor contributing to speech delays in children is excessive and prolonged use of electronic devices, known as screen time. Screen time refers to the time spent in front of electronic media screens[9]. Intensive exposure to electronic screens in children leads to an increase in screen time duration. The American Academy of Pediatrics (AAP) recommends no screen time for children under 2 years old and no more than 1 hour per day for children aged 2-5 years[10]. The Indonesian Pediatric Society (IDAI) has also adopted similar guidelines for screen time duration for preschool-aged children. For example, children under 1 year old should not have screen time, and children aged 1-2 years can have video chatting with parental supervision, while children aged 3-4 years should not exceed 1 hour of screen time with parental supervision[11].

Exceeding 3 times a day with a duration of 30-75 minutes is categorizes as addiction to screen time and can influence the language development of children, placing them in the moderate range, meaning that children with gadget addiction have language development at a moderate level or limited development[12]. The highest risk factor for speech delay in children aged 24-36 months. According to research conducted in Malang, is parental supervision during gadget and multimedia play the odds ratio of 12.158 compared to those without this supervision. The results showed that 20 children with a Developmental Quotient (DQ) score of <80% experienced speech delays[13].

The association with electronic media screen exposure has a significant impact on language and speech development in children, particularly on receptive language. Receptive language is the understanding aspect of communication, and individuals struggling with this language may have difficulty comprehending the goals and intentions in their communication. Based on the issues and data mentioned above, the researcher aims to investigate the developmental delay, particularly in receptive language, in children[14]. The assessment will use screening methods with the Clinical Linguistic & Auditory Milestone Scale (CLAMS). This research will be conducted at Dinoyo Health Center, based on data released by the Malang City Health Office in 2020, where there were 1173 preschool-aged children, and 1166 of them received health services at the Dinoyo Health Center. The data shows that almost the entire number of children have received health services from Dinoyo Health Center.

METHOD

This research is quantitative in nature with a cross-sectional approach, utilizing purposive sampling to determine the sample size. The final calculation resulted in 37 respondents who will be provided with research questionnaire sheets that meet inclusion standards. The inclusion criteria for this study are children aged 1-36 months within the coverage area of Dinoyo Health Center in Malang City, children who understand the Indonesian language, and children willing to participate in the study after receiving an explanation or informed consent. Respondents will fill out a research questionnaire consisting of an electronic media screen exposure intensity questionnaire and the Clinical Linguistic & Auditory Milestone Scale (CLAMS) questionnaire, with the researcher's assistance.

The Capute scales consist of two examination components. To detect speech disorders, the CLAMS is used, and to assess the child's cognitive ability (visual-motor), the CAT instrument is employed. In filling out the CLAMS instrument, it is further divided into two components with a total of 43 questions related to language assessment. The first language component is expressive language, comprising 26 expressive language task groups (based solely on parental reports). The second component is receptive language, with 17 questions[15].

Data that meet the criteria will be collected, and a Spearman test will be conducted to determine the correlation between screen time intensity and language development in toddlers. Additionally, for language types and

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language development, a chi-square test will be used if criteria are met, and if not, a Fisher Exact test will be employed.

RESULTS

The research results from the data of toddlers at Dinoyo Health Center in Malang City revealed a total of 40 toddlers meeting the inclusion criteria. Regarding the screen time duration intensity in toddlers, the study indicated that the majority, 65.0% of toddlers, had electronic media screen exposure for less than 1 hour per day. Meanwhile, 42.5% of toddlers had screen exposure for 1-2 hours per day, and only 5% of toddlers experienced screen exposure for more than 2 hours per day. In terms of frequency intensity, 52.5% of children fell into the category of rare electronic media screen exposure (less than 6 hours per week). On the other hand, 42.5% of toddlers had screen exposure within normal limits (6-14 hours), and only 5% of toddlers experienced frequent screen exposure (more than 14 hours).

Regarding language development in toddlers at Dinoyo Health Center, Malang City, the research results indicated that 50% of toddlers exhibited normal language development, while 42.5% of toddlers showed suspicious language development, and 7.5% of toddlers experienced language and speech delay in their language development. The Spearman correlation test results between the intensity of electronic media screen exposure and toddlers' language development showed no significant relationship between them, with a very low correlation value (0.061) and a high p-value (0.708). Thus, there is no strong evidence supporting a relationship between the intensity of electronic media screen exposure and toddlers' language development.

Based on the relationship between language types in toddlers and language development in children, the most frequent occurrence was normal language development with no language concerns. The Fisher exact test yielded a value of 46.062 with a p-value of 0.000, where $p < 0.05$. It can be concluded that there is a relationship between language development and language types in children.

DISCUSSION

The Relationship of Intensity to Language Development

Based on the intensity of the duration of screen time in toddlers, the highest is the use of electronic media with a duration of <1 hour/day. According to recommendations from the American Academy of Pediatrics, it recommends no screen time at all for children up to 18 to 24 months, except for video chats, and says children ages 2 to 5 should get 1 hour or < 1 hour of screen time. in 1 day[16]. This is in line with research by Yustanta and Fitrian (2022) in preschool children, the duration of electronic media use was 66.1% with an average duration of <1 hour/day, and this research stated that screen time usage in one day was > 1 hour. / day, it can have a negative impact, one of which is that children can become addicted to electronic devices and become lazy about moving or spend little time doing physical activities[17]. This was also explained in other research regarding the impact of using gadgets during the Covid-19 pandemic, the results of which had a negative influence on language development in children. Because the use of gadgets has a positive impact in that it can be a stimulus for children to develop language and speaking skills, however, these gadgets still have a negative impact in the form of changes in behavior in children so they need to be used wisely both in terms of use and duration of use[18].

In addition, the frequency of use of electronic media screens or screen time among toddlers at the Dinoyo Community Health Center in Malang City is at a rare intensity level, namely <6 hours in a period of 1 week, whereas there is research that examines the relationship between screen media exposure. electronics and children's vocabulary skills in the UK. The result is that there is no relationship between 49% of children under 3 years of age who use mobile devices every day with a usage time of <6 hours in less than 1 week or an average daily usage of 20 minutes/day. on children's

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language development[19]. The exposure time in this study was said to be insufficient or insufficient to have an impact on language development, because it is necessary to consider the role of educational applications on electronic devices on children's language development. The use of electronic devices as a function of stimulating children's growth and development is discussed in research regarding the influence of Cocomelon YouTube content on the education of children in the golden age period in the Jabodetabek area. The result is that there is an influence on the education of golden age children of 74.5% of the Cocomelon YouTube content shown to children and the rest comes from factors not studied amounting to 25.5%[20]. There is also a discussion regarding the role of screen time and gadgets on language skills in early childhood, which states that time spent in front of screens (screen time) and electronic devices can have a positive impact on the development of children's language skills. For example, watching interactive videos can improve word understanding and facilitate language learning in children. Some children can even gain English language and literacy skills through electronic devices. However, parents' role in controlling and supervising screen use is very important, where they must be actively involved when their children use screens[21].

When calculated, the duration and frequency used in this study have adhered to the recommendations suggested by AAP. The duration of electronic media screen time usage is regulated by the American Academy of Pediatrics (AAP) (2020), which advises that there is no recommended limit for screen time exposure or screen time usage for children under 2 years old, and for children aged 2-5 years, the ideal usage is limited to 1 hour per day.

The Relationship between Receptive Language Types and Language and Speech Development

Table 1. Fisher Exact Analysis of the relationship between receptive language types in toddlers and the language development of children.

Age of First Introduction to Electronic Media	Language Development			Total
	Normal	Suspect	Language and speech delays	
None	20	0	0	20
Expressive	0	11	2	13
Receptive	0	6	1	7
Total	20	17	3	40
		Fisher Exact		46.062
		P-value		0.000

As for the analysis of toddler language types on language and speech development, the results are that there is a relationship between language development and language type in toddlers with a p-value from the Fisher Exact test results of 0.000, which can be said to be related because the value is <0.05 shown in the **table. 1.** These results show that the majority of children under five experience language development according to standards, namely normal, but there is a small group who face difficulties in expressive and receptive aspects. This is similar to research conducted in China by Bi Ying Hu, Gregory Krik Johnson, Timothy Teo, and Zhongling Wu (2020) regarding the relationship between screen time and the cognitive and social development of children in China. being active has a positive relationship with children's receptive language comprehension abilities and their science knowledge (Hu et al., 2020)[22]. And

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Table 2. Cross-tabulation based on types of language and speech developmental delays and age groups in toddlers.

Types of developmental delays language and speech \ Age group	1-12 month	13-24 month	24-36 month	Frequency	Percentage
None	9	8	3	20	50
Expressive	3	3	7	13	32.5
Receptive	3	2	2	7	17.5
Total	15	13	12	40	100

As stated in the table. 2 of the age group results regarding the type of language and speech delays in children where the highest group of language and speech delays is in the expressive language type in the 24-36 month age category. Delays in expressive language tend to be more common compared to receptive language, where many children obtain receptive language honing through educational content watched via electronic media. However, if you do screen time without assistance, it tends to make the interaction not two-way so that the child's expressive abilities are less honed. Research shows that there is no correlation between screen time and language development due to passive exposure or indirect exposure given to children so that language development disorders do not occur. What has a greater influence on children's language development is direct interaction or communication with parents or family members[23].

The development of receptive language in children in this study is more easily stimulated by providing screen time, so that more two-way communication encouragement is needed from parents or caregivers to children outside of screen time so that children's expressive language skills can be honed. This is in line with research conducted by Meta van den Heuvel (2019) regarding the use of mobile media devices related to expressive language delays in toddlers aged 18 months, with the research results that there is a significant relationship between the use of electronic media devices on children's expressive language delays and the causes. The occurrence is the result of low interaction provided by caregivers (van den Heuvel et al., 2019)[24]. Meanwhile, other research conducted by Rossano (2020) regarding screen time in early childhood revealed that WHO and other policy makers have issued many guidelines to limit the use of electronic media devices, but this use can actually provide opportunities to connect digitally and socially as well as for education so it is important for everyone around the child to be firm in complying with screen time rules[25].

CONCLUSION

Our research results indicate that there is no correlation between exposure to electronic media screens or screen time and language and speech delays, as there are other factors that can influence these occurrences. This finding is further supported using screen time intensity that adheres to the guidelines provided by the American Academy of Pediatrics (AAP) to prevent language and speech delays in children.

Ethical Clearance

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Ethical approval No. E.5a/288/KEPKUMM/IX/2023

Declaration of Conflicting Interest

The authors declare that they have no conflict of interest.

ORCHID IDs

All authors contributed equally to this research.

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