RESEARCH ARTICLE

Effect of reducing screen time in children with speech delay: A pilot study

Maimuna. Rashid[1], Jawad Jalil[2], Syed Aoun Abbas Mehdi[3], Farah Mahboob[4]

Abstract

Objective: To evaluate the effect of reduced screen time in children presenting with delayed speech.

Method: The quasi-experimental study was conducted at the Department of Paediatrics and the Department of Rehabilitation Medicine, Combined Military Hospital, Pano Aqil, Pakistan, from August 2020 to June 2023, and comprised all children presenting with specific speech delay between ages 18 months and 5 years. They were randomised into two groups using the lottery method. Intervention group A had their screen time reduced to zero or <30 minutes per 24 hours for a period of 3 months, while control group B continued with their regular screen time habits. Number of vocabulary words spoken on a daily basis were assessed and compared at baseline and 3 months after reducing the screen time. Data was analysed using SPSS 23.

Results: Of the 160 subjects, 80(50%) were in group A; 46(57.5%) boys and 34(42.5%) girls with mean age 31.85±7.75 months. There were 80(50%) subjects in group B; 43(53.7%) boys and 37(46.3%) girls with mean age 30.69±6.71 months. Overall, mean screen time at baseline was 8.71±1.56 hours (range: 6-10 hours) daily. Number of vocabulary words increased to 76.05±97.27 words post-intervention in group A compared to 3.38±3.00 words in group B (p<0.001). Gender, age, maternal working status, socioeconomic status and peer interaction had no significant effect on the outcome (p>0.05).

Conclusions: Reducing the screen time resulted in a significant improvement in children with speech delay.

Keywords: Speech disorder, Language problems, Children, Media. (JPMA 75: 717; 2025)

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Introduction

The social and cultural milieu of societies all over the world is in a flux and has already seen a momentous change during the last few decades. Though the process of change has been a permanent feature of human evolution since the beginning of human society, the rate of change has leapfrogged at a dizzying speed in the last few decades. This has revolutionised life patterns all over the world, and child-rearing practices are no exception. The dilution of large joint families, more involvement of mothers in workplace and small family size are few of the factors contributing to this change. The advent of television, internet and mobile phones has made the presence of screens ubiquitous in the day-to-day life of children.[1,2] Although these screens might be useful to children to some extent, like participating in educational programmes,[3] excessive screen viewing is associated with negative outcomes, like obesity,[4] behavioural problem,[5] emotional regulation problems,[6] speech delays[7] and academic problems.[8] It has further been suggested that time spent in viewing screens, displaces the time needed for free and active play in childhood, interferes with social interactions, like with family and peers, and impacts sleep duration and quality.[9,10] In response to the public health concerns resulting from increase in screen time, international researchers, non-governmental organisations (NGOs) and policymakers in 2017 developed the 24-Hour (H) Movement Guidelines for the Early Years to encourage and promote optimal health behaviours in early childhood.[11,12] The guidelines recommend that children aged <5 limit screen time to 1 hour per day.

To our knowledge, there are no studies done in Pakistan about incidence, prevalence and impact of screen time on the children. The current study was planned to fill the gap by evaluating the effect of reduced screen time in children presenting with delayed speech.

Subjects and Methods

The quasi-experimental study was conducted at the Department of Paediatrics and the Department of Rehabilitation Medicine, Combined Military Hospital (CMH), Pano Aqil, Pakistan, from August 2020 to June 2023. After approval from the institutional ethics review committee, the sample size of 150 (75 in each group) was calculated using EpiInfo calculator with two-sided significance level (1-alpha) 95%, power (1-beta, % chance of detecting) 80%, ratio of unexposed/exposed 1, 15%

[1]Department of Rehab Medicine, Combined Military Hospital, Pano Aqil, Pakistan; [2]Department of Paediatrics, Combined Military Hospital, Pano Aqil, Pakistan; [3]Department of Otorhinolaryngology, Combined Military Hospital, Pano Aqil, Pakistan; [4]Department of Rehab Medicine, Combined Military Hospital, Quetta, Pakistan.

Correspondence: Maimuna Rashid. e-mail: miona.rashid@gmail.com
ORCID ID: 0009-0000-3002-3885

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unexposed with outcome, 35% exposed with outcome, and odds ratio (OR) of 3.0.[13] The sample was raised using non-probability consecutive sampling technique. Those included were children aged between 18 months and 5 years presenting with specific speech delay. Speech delay was defined as the inability to reach the speech proficiency appropriate for the chronological and developmental age of the child. Children with birth asphyxia, dysmorphism, head and neck deformities, gross developmental delay, chromosomal disorders, traumatic head injury, in-born errors of metabolism, and history of meningoencephalitis were excluded. All those unable to complete 3-month follow-up were also excluded, and children unable to reduce the screen time to the prescribed limit of <30 minutes per 24 hours were also excluded.

After taking informed consent from the parents, the children were randomised into intervention group A and control group B using the lottery method. Group A subjects had their screen time reduced to zero or <30 minutes per 24 hours for 3 months, while group B subjects were allowed to continue with their regular screen time habits.

Baseline assessments of speech delay severity were conducted for all participants with the help of thorough history from the parents and caregivers. Pre-intervention characteristics included total screen time, number of words being spoken, and peer interaction. Demographic characteristics, like age, gender, number of siblings and socioeconomic status (SES), were recorded. The status of mother whether working or housewife was also recorded. Follow-up assessments were done at the end of the 3-month intervention period to evaluate changes in speech performance, which was assessed on the basis of the number of vocabulary words spoken on a daily basis compared the baseline. Peer interaction was evaluated subjectively on the basis of information given by the parents and caregivers.

Data was analysed using SPSS 23. Data was reported as either mean±standard deviation, or as frequencies and percentages, as appropriate. The outcome variable was compared between the groups using the independent samples t test. P<0.05 was considered significant.

Results

Of the 209 subjects screened, 22(10.5%) were unable to reduce the screen time to the prescribed limit. Of the remaining 187(89.5%) participants with mean age 31.27±7.25 months, 94(50.3%) were randomised to group A and 93(49.7%) to group B. Further, 14(14.9%) patients in group A and 13(14%) in group B did not complete the 3-month period. The final sample, as such, stood at 160(85.6%). Of them, 80(50%) were in group A; 46(57.5%)

Table-1: Baseline characteristics of the participants (n=160).

Characteristics	No. of participants in intervention group (n=80)	No. of participants in control group (n=80)
Mean Age (months)	31.85±7.75	30.69±6.71
Gender		
Male	46 (57.5%)	43 (53.7%)
Female	34 (42.5%)	37 (46.3%)
Mean screen time (hours)	8.75±1.66	8.68±1.45
Socioeconomic status		
Low	6 (7.5%)	6 (7.5%)
Middle	19 (23.8%)	20 (25.0%)
Upper	55 (68.8%)	54 (67.5%)
Working mother		
Yes	27(33.7%)	30 (37.5%)
No	53 (66.3%)	50 (62.5%)
No. of siblings		
None	39 (48.8%)	38 (47.5%)
1	23 (28.8%)	32 (40.0%)
2 or more	18 (22.5%)	10 (12.6%)

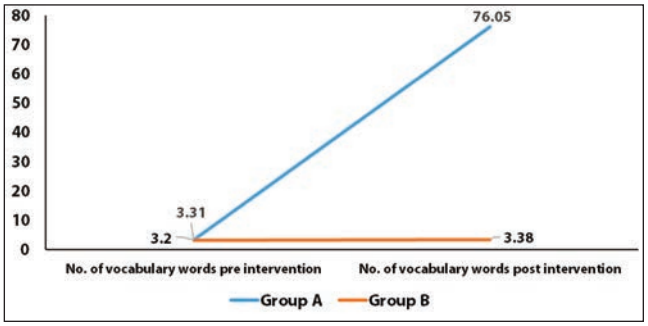

Figure: Intergroup comparison of the mean number of vocabulary words at baseline and post-intervention.

Table-2: Intergroup comparison of the number of vocabulary words picked up post-intervention in relation to baseline characteristics.

	No. of participants in intervention group (n=80)	No. of participants in control group (n=80)	*p*-value
Gender			
Male	78.65±97.9	3.95±2.9	<0.001
Female	72.53±97.7	2.70±3.10	<0.001
Mean Age			
18-33 months	42.68±66.9	1.94±2.06	<0.001
34-50 months	131.67±114.35	6.19±2.57	<0.001
Working mother			
Yes	92.22±114.5	3.50±3.30	<0.001
No	67.81±87.3	3.30±2.80	<0.001
Socioeconomic status			
Low	44.0±25.9	5.33±2.42	0.005
Middle	45.63±63.81	2.80±1.73	0.005
High	90.05±108.54	3.37±3.36	<0.001
Peer Interaction			
Nil	78.67±109.2	2.00±2.9	0.383
Poor	81.65±101.40	3.40±3.06	<0.001
Satisfactory	60.15±84.62	3.43±2.98	0.007

boys and 34(42.5%) girls with mean age 31.85±7.75 months. There were 80(50%) subjects in group B; 43(53.7%) boys and 37(46.3%) girls with mean age 30.69±6.71 months. Overall mean screen time was 8.71±1.56 hours (range: 6-10 hours) daily. Baseline characteristics of the groups were comparable (Table 1).

At baseline, the speech level in terms of number of vocabulary words spoken daily was 3.31±3.21 words in group A and 3.20±3.04 in group B (p=0.821). Post-intervention, the difference was significant, with group A value being 76.05±97.27 words compared to 3.38±3.00 words in group B (p<0.001) (Figure).

Gender, age, maternal working status, SES and peer interaction had no significant effect on the outcome (Table 2).

Discussion

The study was conducted At CMH Pano Aqil, which is a large tertiary care 450-bed hospital in the heart of rural Sindh. A large number of patients from the province as well as adjacent areas of Balochistan and southern Punjab access the hospital for their healthcare needs. This allowed the current study to collect a large cohort of speech delay patients. Besides, the three-year duration of the study makes it a robust study.

A total of 209 patients were recruited for the study, and 22(10.52%) were unable to reduce the screen time of 30 minutes or less. This shows that, despite counselling and explaining the disastrous effects of excessive screen time, more than 1 in 10 parents failed to reduce it, underlining the addictive nature of the digital screens. Of the remaining 187 patients, 27 were lost to follow-up. The most important reason for the high dropout rate was posting and transfers of army personnel, while some civilian patients also failed to return for the follow-up.

The pre-intervention screen time (8.71±1.56 hours) in the cohort was very high compared to most international studies.[14] In our society, digital screens with internet connectivity is still a relatively new phenomenon and people are not aware of the detrimental effects of this new medium. That is why they allow indiscriminate use of these devices by the young children due to their convenience and affordability.

The current study showed that problem of excessive screen time in children was significantly more in higher socioeconomic groups. Studies from developed countries showed that the problem was much more common in families of lower socioeconomic status.[15,16] This can be explained by the fact that poor families in Pakistan cannot afford the digital screens, while in developed countries these are cheaper than other activities, like sports clubs. Also the working parents might find it very difficult to take out time for their children.

The ratio of working mothers in both the current groups was almost identical, but the average was much higher than the average working women in society at large. This indicates that working mothers find it convenient to engage their children in digital screens so that they may manage their manifold responsibilities of job and home management.[17]

The current data also showed that single children were more vulnerable to problems associated with excessive screen time as they did not have the luxury of peer interaction with their siblings, spending more time on digital screens.

After a single and specific intervention, significant improvement was noted in the current study. A secondary effect of reducing the screen time was improvement in peer interaction. Although there was no objective method of assessing this, most of the caregivers of the children in intervention group confirmed a reasonable improvement in peer interaction with reduction in screen time, which was in line with literature.[18]

The present study's findings emphasised the importance of incorporating screen time reduction strategies as part of the management plan for children with speech delay. Clinicians and parents should be educated about the potential adverse effects of excessive screen time on speech development. Healthcare professionals working with children with speech delay should consider assessing and addressing screen time habits as part of their intervention strategies.[19]

The current study has limitations. The study duration of 3 months may limit the understanding of the long-term effects of reducing screen time on speech development. Further research with extended follow-up periods is warranted to evaluate the sustainability of the observed improvements. Additionally, the study did not differentiate between different types of screen content, such as educational versus non-educational, which may influence speech development differently. Future investigations could explore the specific impact of various types of screen content on speech improvement in children with speech delay.

Conclusion

Reduction in screen time resulted in a significant improvement in speech among children with speech delay.

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Conflict of Interest: None.

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Author Contribution:
MR: Concept, design, data acquisition, analysis, drafting and review.
JJ & FM: Drafting, revision and final approval.
SAAM: Data acquisition, analysis and drafting.