

Determinants of Speech and Language Delay in Paediatric Patients: A Cross-Sectional Study from a Tertiary Care Centre in Bangladesh

Md Sayeedul Haq Sayeed^{1*} Sheikh Mst. Khadija Akter Meeli² Din Islam Masum³ Juwel Das¹
Palash Chandra Sarkar¹ Sadia Alam¹ Sattar Mohammad Sumon⁴

ABSTRACT

Background: Intelligible speech and language indicate a child's overall development and cognitive abilities. Identifying factors linked to speech and language delay is essential for awareness and early intervention. However, data from Bangladesh on this subject is limited. This study aims to identify risk factors for speech and language delay in children aged 2-5 years at a tertiary hospital in Bangladesh. A cross-sectional study was conducted at a teaching hospital's Paediatric outpatient department.

Materials and methods: Ninety children (45 with delayed speech, 45 controls) aged 2-5 years were included. Guardians answered a questionnaire about morbidity, risk factors and developmental milestones. Data were analysed using SPSS v 19, with χ^2 test and descriptive analysis. $p < 0.05$ was significant.

Results: Speech/Language delay occurred in 45 of 1785 children. Risk factors were seizures ($p < 0.001$) perinatal asphyxia ($p = 0.011$) oro-pharyngeal deformity ($P = 0.007$) multiple language environment ($p < 0.001$) family history ($p = 0.013$) low maternal education ($p < 0.001$) consanguinity ($p < 0.001$) screen time > 3 hours daily and inadequate stimulation ($p < 0.001$).

Conclusion: Prevalence was 2.52%. Medical risk factors included male gender, perinatal asphyxia, seizure disorder and oro-pharyngeal deformity. Familial and environmental causes were low maternal education, consanguinity, family history, multiple language exposure, screen time > 3 hours daily and inadequate stimulation.

KEY WORDS

Risk factors; Speech and language delay; Tertiary level hospital.

INTRODUCTION

Speech refers to the sounds produced, while language pertains to comprehension. Speech and language delay in children aged 2 to 5 years is common, with an estimated prevalence ranging from 2% to 12%.¹ The acquisition of intelligible speech and language serves as a valuable indicator of a child's overall development and cognitive abilities.² A speech and language delay is

characterised by the child's development of speech and language in the correct sequence but at a slower pace than expected.¹ A child is diagnosed with a speech or language delay when their conversational speech sample is either more incoherent than expected for their age or is marked by speech sound error patterns inappropriate for their age. The consequences of speech and language delay are numerous, including delayed phonation, childhood stuttering, articulation problems, developmental verbal dyspraxia, and unusual voice quality, among others. Evidence indicates that untreated speech and language delay can persist in 40%–60% of children, increasing the likelihood of social, emotional, behavioural, and cognitive problems in adulthood.³ Therefore, early diagnosis and intervention for children with speech delay are crucial. Several factors are associated with speech delay, including gender, hearing loss, persistent otitis media, perinatal asphyxia, prematurity, low birth weight, low parental education, electronic device screen time, lack of prenatal communication with the child, poor nutrition, positive family history and living in a nuclear family in an urban area, among others.⁴ Awareness of these risk factors in children under 5 years old with changes in speech-language development, as well as the implementation of early intervention, can mitigate the

1. □ Assistant Professor of Paediatrics
□ Brahmanbaria Medical College, Brahmanbaria.

2. □ Assistant professor of Biochemistry
□ Brahmanbaria Medical College, Brahmanbaria.

3. □ Associate Professor of Paediatrics
□ Monowara Sikder Medical College, Shariyatpur.

4. □ Professor of Burn and Plastic Surgery
□ Monowara Sikder Medical College, Shariyatpur.

*Correspondence □ Dr. Md Sayeedul Haq Sayeed
□ Email: dr.sayeedhaq@gmail.com
□ Cell : +88 01711 14 84 61

Date of Submission □ 06.04.2026

Date of Acceptance □ 02.05.2026

impact on various aspects of their lives. This particular study was designed to raise awareness among parents and professionals to provide early intervention by examining potential risk factors. Data on this subject from Bangladesh are limited compared to Western countries. Consequently, a cross-sectional study assessing the prevalence and factors affecting speech and language delay in children aged 1 to 5 years was conducted over one year in a tertiary-level hospital. This study may be beneficial in raising awareness among parents and medical practitioners to provide early intervention by identifying potential risk factors.

MATERIALS AND METHODS

A cross-sectional study was conducted in the Outpatient Department (OPD) of Brahmanbaria Medical College & Hospital from January 2024 to December 2024. Informed consent was obtained from all parents responsible for the participating children. The study included every consecutive child aged 1–5 years who was brought by caregivers for suspected delayed speech, referred specifically for speech delay, identified with delayed speech through DQ/IQ testing, or undergoing speech therapy. Children whose caregivers did not consent to participation were excluded. The study group comprised 42 children, while an additional 42 children without speech-language delay were enrolled as the control group, following consent from their guardians. The guardians of all participating children were requested to complete a predesigned questionnaire, which included questions related to birth history, the child's morbidity pattern, and high-risk factors for speech delay. The child's growth was assessed using anthropometric measurements, and developmental milestones were examined and recorded on a data collection sheet.

Data entry was done using Microsoft Office 2025 and analysed using Statistical software for social science 26 (SPSS). Descriptive analysis was presented as mean, standard deviation, and frequency. Statistical tests of significance used were the unpaired t-test, Chi-square test and Fisher's exact test. A p-value of 0.05 is considered significant.

RESULTS

A total of 1,785 children aged 2–5 years attended the Pediatric Outpatient Department (OPD) during the study period [Figure 1]. Among these, 45 children (2.52%) were identified as having speech and language delays.

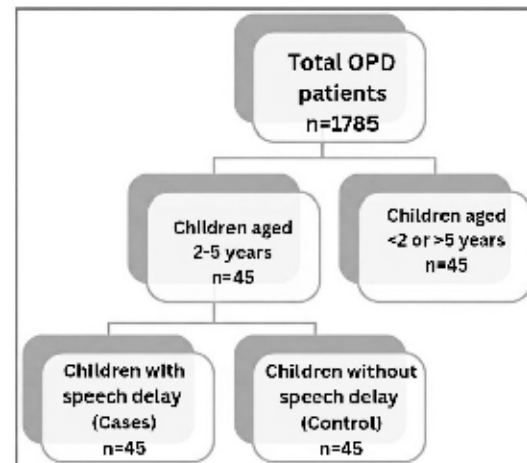


Figure 1 Flow chart showing children with speech delay attended the paediatric OPD

The baseline characteristics of the study group and control group were compared, with gender distribution detailed in Table I. A higher incidence of speech and language delay was observed in males (n=45, 69%). The association between gender and speech delay was statistically significant (p-value=0.01) indicating that male gender is a risk factor for speech and language delay.

Table I Gender distribution of children with speech and language delay

Gender	Frequency	Percentage (%)	p-value
Male	31	69%	0.01
Female	14	31%	
Total	45	100%	

Table II Age distribution of children with speech and language delay

Child age	Frequency	Percentage (%)
2-4 years	29	64.5%
4-5 years	16	35.5%
Total	45	100%

Eight medical risk factors for speech–language delay were analysed in both groups [Table III]. A statistically significant difference was observed between the two groups for three factors: seizure disorder, perinatal asphyxia, and oropharyngeal deformity, indicating an association between these risk factors and speech–language delay.

Additionally, eight family-based and environmental risk factors were examined between the two groups [Table IV]. Factors such as screen time (mobile/TV) exceeding three hours per day, lack of stimulation, multilingual environments, a positive family history of speech-language delay, consanguinity, and low maternal education were found to be associated with speech-language delay. A statistically significant difference was noted between the two groups for these factors.

Table III Comparative analysis of clinical risk factors associated with speech-language impairment

Factor	Study group (n=45)	Control group (n=45)	p
Deafness	1 (2.2%)	0	1.000***
Chronic otitis media	2 (4.4%)	0	0.247***
Seizure disorder	12 (26.6%)	0	<0.001*
Perinatal asphyxia	12 (26.6%)	3 (7.1%)	0.011*
Low birth weight	10 (22.2%)	5 (11.9%)	0.157*
Prematurity	6 (13.3%)	2 (4.8%)	0.19***
Oro-pharyngeal deformity	7 (15.5%)	0	0.007***
Congenital hypothyroidism	1 (2.2%)	0	1.000***

*Chi square test, **Unpaired t test, ***Fisher's exact test. Bold: p value <0.05 is statistically significant.

Table IV Comparative analysis of family based and environmental risk factors for speech language delay between study and control groups

Factor	Study group (n=45)	Control group (n=45)	p
Multiple language	31 (68.8%)	3 (6.6%)	<0.001*
Positive family history of speech disorder	10 (22.2%)	2 (4.4%)	0.013*
Large family	19 (42.2%)	23 (51.1%)	0.4
Family disharmony	9 (20%)	6 (13.3%)	0.396
Low maternal education (<10th std)	34 (75.5%)	12 (26.6%)	<0.001*
Consanguinity	25 (59.5%)	8 (19%)	<0.001*
Screen time (Mobile/TV) over 3 hours per day	32 (71.1%)	19 (42.2%)	0.006*
Inadequate stimulation	27 (60%)	0	<0.001*

*Chi square test, **Unpaired t test, ***Fisher's exact test. Bold: p value <0.05 is statistically significant.

DISCUSSION

In this study, 2.52% of children attending the paediatric outpatient department exhibited speech-language delay, aligning with prevalence estimates from previous

research that range from 2% to 8%. Prior research has indicated a greater prevalence in males, ascribed to the delayed maturation of the central nervous system in boys and testosterone's function in inhibiting cell death while impairing optimal neural connectivity. Our results similarly exhibited a significant gender disparity.⁵ We assessed various medical risk factors for language delay, encompassing deafness, chronic otitis media, seizure disorders, perinatal asphyxia, low birth weight, prematurity, and oropharyngeal deformities.⁶ Perinatal asphyxia, seizure disorders, and oropharyngeal deformities were identified as statistically significant predictors. The association between perinatal asphyxia and language impairment is well-documented in the Literature. Seizure-related hypoxic brain injury can hinder various developmental domains, presenting as speech-language delays.⁷ Structural anomalies in the oral and pharyngeal regions have been linked to speech and language impairments. While other studies associate deafness with delayed language development, this correlation was not significant in this case, as only one participant exhibited hearing loss. Non-medical risk factors included familial and environmental influences. Among familial factors—such as multilingual home environments, consanguinity, family history of speech-language disorders, large family size, family discord and low maternal education multilingual settings, consanguinity, favourable family history and low maternal education were significantly correlated with speech-language delay.⁸ Multilingual households, common in urban Bangladesh, may confuse young children as they learn a new language.

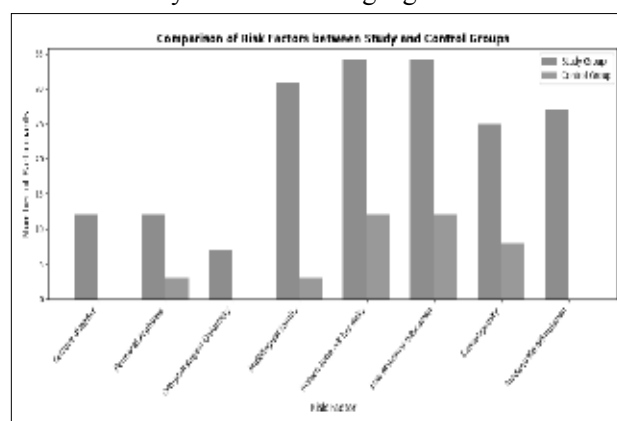


Figure 2 Significant risk factors associated with speech-language impairment⁵⁹

Consanguinity was a significant risk factor in our cohort, even without concomitant hearing impairment; other studies have connected it primarily to deafness-induced speech delays.⁹ A family history of speech-language disorders, particularly involving first-degree

relatives, is a recognised risk. Higher parental education fosters greater child engagement and exposure to sophisticated vocabulary, thereby boosting language abilities. Although large family size has been implicated in speech delays elsewhere, it was comparable across groups in our study and thus non-significant.¹⁰

Environmental factors assessed included screen exposure exceeding 3 hours daily, low socioeconomic status and insufficient stimulation. Excessive screen time (>3 hours/day) and inadequate stimulation were statistically significant, aligning with existing evidence of speech delay.⁵¹

STRENGTHS OF THE STUDY

The strengths of the study are that we have studied a large number of risk factors not routinely examined by Bangladeshi authors. The results of this study can help family physicians and primary care clinicians identify risk factors to facilitate timely detection and provide early intervention for speech and language delay.

LIMITATIONS

The limitations of this study are that our study population was small and strictly hospital based, which could cause some amount of sample bias. Second, only a cross-sectional assessment was made to diagnose speech-language delay in children.

CONCLUSION

Speech and language development serves as a valuable indicator of a child's overall development. In this study, speech-language delay affected 2.52% of children, linked to both medical (Biological) and non-medical (Environmental and familial) risk factors. Key medical risk factors included perinatal asphyxia, seizure disorders and oropharyngeal deformities. Significant familial and environmental factors were low maternal education, consanguinity, positive family history, multilingual home environments, screen exposure exceeding 3 hours daily and inadequate stimulation.

ACKNOWLEDGEMENTS

The authors are grateful to the entire staff of Department of Paediatrics at Brahmanbaria Medical College Hospital during the study period.

DISCLOSURE

All of the authors declared no competing interests.

REFERENCES

1. Al Hosani S S, Darwish E A, Ayanikalath S, Almazroei R S, Almaashari R S & Wedyan A T. Screen time and speech and language delay in children aged 12–48 months in UAE: A case-control study. *Middle East Current Psychiatry*. 2023;30(1). <https://doi.org/10.1186/s43045-023-00318-0>

2. Sunderajan T, Kanhere SV. Speech and language delay in children. Prevalence and Risk factors. *J Family Med Prim Care*. 2019;8(5):1642-1646.

3. Wallace I F, Berkman N D, Watson L R, Coyne-Beasley T, Wood C T, Cullen K & Lohr K N. Screening for Speech and Language Delay in Children 5 Years Old and Younger: A Systematic Review. *Pediatrics*. 2015;136(2):e448–e462. <https://doi.org/10.1542/peds.2014-3889>.

4. Shriberg L D, Friel-Patti S, Flipsen P & Brown R L. Otitis media, fluctuant hearing loss and speech-language outcomes: A preliminary structural equation model. *Journal of Speech, Language and Hearing Research*. 2000;43(1):100–120. <https://doi.org/10.1044/jslhr.4301.100>.

5. Pinares-Garcia P et al. Sex: A Significant Risk Factor for Neurodevelopmental and Neurodegenerative Disorders. *Brain Sciences*. 2018;8(8):154. doi:10.3390/brainsci8080154.

6. Campbell T F et al. Risk Factors for Speech Delay of Unknown Origin in 3 Year Old Children. *Child Development*. 2003;74(2):346. doi:10.1111/1467-8624.7402002.

7. Taylor C L et al. Prenatal and perinatal risks for late language emergence in a population-level sample of twins at age 2. *BMC Pediatrics*. 2018;18(1). doi:10.1186/s12887-018-1035-9.

8. Hoque F, Akhter S and Mannan M. Risk factors identification of speech and language delay in children in a tertiary level hospital: A pilot study. *World Journal of Advanced Research and Reviews*. 2021;11(1):103. doi:10.30574/wjarr.2021.11.1.0323.

9. Ahmed M E.-R et al. Documentation of delayed language development in Upper Egypt. *Egyptian Journal of Ear Nose Throat and Allied Sciences*. 2019;20(3):122. doi:10.21608/ejentas.2019.11294.1091.

10. McLaughlin, MR. Speech and language Delay in children. *American Family Physician*. 2011;83:1183-1188.