

Prevalence and Factors Associated with Isolated Language Delay in under Five Pediatrics Patients who have follow up at Neurology Clinic of Saint Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2022: A Cross-Sectional Prospective Study

Fasil Menbere¹, Zenawit Alemayehu¹, Yohannes Godie^{2*}

¹Department of Pediatric and Child Health, Saint Paul's hospital Millennium Medical College, Addis Ababa, Ethiopia

²Department of Pediatric and Child Health, Debre Markos University, Debre Markos, Ethiopia

Abstract

Background: Speech is a combination of sounds produced for expressing language, while language is a measure of comprehension that allows reasoning, conceptualization, and understanding. Speech and language delay are the most common impairments in early childhood with prevalence ranging from 2.3 -19 percent. This study aims to determine the prevalence and associated factors of isolated speech and language delay in patients seen at the pediatric neurology clinic of SPMMHC.

Methods: An institution-based cross-sectional prospective study was conducted in the Department of Pediatrics and Child Health of SPMMHC using a structured and standardized questionnaire. The calculated sample size was 269 subjects, and cases of patients with neurologic disorders who came to the hospital during the study period were included consecutively until the calculated sample size was attained. Data was analyzed using version 26.0.

Results: The prevalence of language and speech delays was found to be 66.5%. Having bilingual family members (COR=4.2,95% CI: 2.22-7.943), male sex(COR=4.13,95% CI:2.15-7.94), history of seizure (COR=4.13,95% CI:1.07-3.78), history of hearing impairment (COR=2.76,95% CI:1.44-5.29), maternal history of preeclampsia(COR=2.03,95% CI:1.04 -3.98), history of postnatal asphyxia(COR=2.81,95% CI:1.35-5.86)andaverage screen time of more than one hour(COR=2.36,95% CI:1.24-4.47) were factors significantly associated with language and speech delay.

Conclusion: The prevalence of isolated speech and language delay was higher in this study. From this study, we concluded that further studies should be done and that health institutions should focus on guidelines that allow screening of every patient visiting the pediatric unit

Keywords: Language • Speech • Delay • Under five pediatrics • Follow up

Abbreviations: AOR: Adjusted Odd Ratio, COR: Crude Odd Ratio, CSA: Central Statistical Authority, IQ: Intelligence Quotient, IRB: Institutional Review Board, OPD: Outpatient Department, PDD: Pervasive Developmental Disorder, SPMMHC: St Paul Hospital Millennium Medical College, SPSS: Statistical Package for the Social Science

Introduction

Language is a means of communication and speech is verbal production of language. Speech and language delay are the most common impairments in early childhood with wide variation in prevalence ranging from 2.3%-19% [1]. This variation is due to differences in the age groups included in the studies, the limited availability of the assessment tools used, and variations in terminologies [2,3]. Speech delay is defined as when the child's conversational

speech sample is either more incoherent than would be expected for age or is marked by speech sound error patterns not appropriate for age [4].

Speech and language delay has a significant negative effect on long term academic, psychological and social development. Slower information processing skill poor literacy skill like reading and spelling, lower IQ and psychosocial deficit persisting to adulthood leading to poor job opportunities, behavioral problem and lack of socialization are some of the identified short term and long term impacts [1,3].

Speech and language delays can be due to primary or secondary underlying causes. Different kinds of environmental and biological factors have been identified. Prematurity, low birth weight, prenatal disorders, visual impairment, hearing impairment, congenital cleft palate, central nervous system impairment, mental disability, low income, low parental education, lack of a stable residence, inadequate health care facilities, living in a crowded house, and being a male are some of the risk factors that have been identified [2,3,5].

Speech and language delays are the most common impairments in early childhood and have a negative effect on long-term academic, psychological, and social development. Early identification of and early intervention for communication delays in infants minimizes the effect of the

***Address for Correspondence:** Yohannes Godie, Department of Pediatric and Child Health, Debre Markos University, Debre Markos, Ethiopia, E-mail: yohannesguadie@gmail.com

Copyright: © 2023 Menbere F, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Received: 10 April 2023, Manuscript No. JPNM-23-95036; **Editor assigned:** 12 April 2023, Pre QC No. P-95036; **Reviewed:** 27 April 2023, QC No. Q-95036; **Revised:** 04 May 2023, Manuscript No. R-95036; **Published:** 11 May 2023, DOI: 10.37421/2472-100X.2023.8.221

delay on educational and social outcomes [3]. In addition to these children with delayed language milestones, there are often poor scholastic performances and learning disabilities. This may persist into adulthood, leading to poor job opportunities, behavioral problems, and a lack of socialization [1]. In children not meeting the expected milestones for speech and language, a comprehensive developmental evaluation is essential, because atypical language development can be a secondary characteristic of other physical and developmental problems that may first manifest as language problems [6]. Prevalence of speech and language delays within countries and internationally varies significantly [3].

Since delay in speech and language has a negative impact on academic, psychological, and social development, understanding the prevalence and associated factors of speech and language delay helps to employ early screening and early detection, which can prevent late complications like lower IQ scores, slower information processing skills, and poorer literacy skills like reading and spelling. There are no studies on the topic done in Ethiopia. Knowing the prevalence and associated factors of isolated speech and language delay will pave the way to the initiation of speech therapy in our unit. The findings of this study will serve as baseline information for those who wish to work further on the topic.

Methods

Study setting, period and design

The study was conducted in the pediatrics department of the neurology clinic at SPHMMC. The study was conducted from February to July 2022 (G.C.). A hospital based cross-sectional prospective study was conducted at the pediatrics neurology clinic by using a validated standard questionnaire and Trivandrum language evaluation scale.

Source population

All children who were evaluated at the pediatric neurology clinic of SPHMMC during the study period

Study population

All children who fulfill the eligible criteria during the study period

Inclusion criteria

Any child who is from one year to 5 years of age attending the pediatrics neurology clinic of SPHMMC

Exclusion criteria

Those children aged one to five years, as well as those with delays in gross or fine motor development

Sample size

The sample size was determined by using a single population proportion formula, considering the following assumptions: a prevalence of language and speech delay of 20%, the margin of error of 5%, and a 95% confidence interval. The sample size was calculated using the following formula:

The calculated sample size was 242, Assuming 10% non-response rate total sample size 269

$$N = Z^2 p (1-p) / W^2, p=20\%, Z=1.96, W=5\% \text{ margin of error}$$

Sampling procedure

All pediatricians who visited the pediatric neurologic clinic at SPHMMC were enrolled in the study. A simple systematic random sampling technique was used, and the first participant was selected by a lottery method, then every fifth participant was chosen till the sample size was achieved.

Dependent variable: Speech and language delay

Independent variable: Age, religion, gender, prematurity, Parental age, Family income, Maternal education, Maternal complications during ANC follow-

up, labor, and delivery, Bilingual family members, number of family members, place of residence, history of environmental pollution, family history and speech and language delays, average screen time, Oropharyngeal deformity, Diagnosis of autism and Hearing impairment

Operational definitions

Urban: Based on the CSA, urban is defined as localities with 2000 or more inhabitants.

Rural: Any population, housing, or territory not in an urban area with low population density.

Noise pollution: Any disturbing or unwanted noise that interferes with or harms humans or wildlife

Hearing impairment: An impairment in hearing, whether permanent or fluctuating, that adversely affects a child's educational performance.

Preeclampsia is the new onset of hypertension and proteinuria, or the new onset of hypertension and significant end-organ dysfunction with or without proteinuria after 20 weeks of gestation or postpartum in a previously normotensive patient.

Asphyxia: Failure to establish breathing at birth.

Isolated language and speech delay: failure to attain language and speech development at a specific age in a child with normal gross and fine motor development

Oropharyngeal deformity: Defect in the formation and growth of the jaw, oral cavity, and pharynx, leading to a variety of malformations

Instruments

Since there was no available language and speech assessing tool developed in Ethiopia, an assessment scale from Trivandrum, which was used in a similar study conducted in India, was used. A pilot study was done using 10% of the study population for the assurance of validity and reliability.

Data collection and procedure

Data collection was undertaken by a general practitioner who was trained on the questionnaire and the Trivandrum speech and language assessment.

Data quality control and management

The questioner was reviewed by the researcher before it was filled out by the study population. The researcher provided supportive supervision to the data collector and made sure that it was performed according to the protocol. Each day, the collected data was checked for accuracy and completeness. The participants' names were not included.

Data analysis plan and procedure

After data was collected each questionnaire was checked for completeness based on the code given during data collection. The data was entered in to Epi-data version 4.2 and then exported and analyzed using SPSS version 26. A confidence limit of 95% and p-value less than 0.05 is considered statistically significant.

Results

The median maternal age was 27 years, with an interquartile range of 25.0 to 35 years. Most of the mothers (66.5%) of the under-five children were between the ages of 19 to 34 years. Nearly half (47.6%) of them were orthodox Christian followers, and 75.5% were urban area residents. Furthermore, 43.5% of respondents attended primary school, and 52.4% of them were categorized as lower-class based on their daily income (Table 1).

Regarding the characteristics of the 269 respondents seen at follow-up, 50.9% were female, and 19.7% were between the ages of 12 and 18 months. Out of the total respondents, 97.4% of children lived with their parents. Besides,

83.3% of children had birth weights between 2.5 and 4 kg, and 89.2% were term during delivery (Table 2).

Concerning complications of the mother during ANC, labor, and delivery, 99.6%, 97.0%, 91.1%, and 91.1% had no history of substance use, intrauterine fetal death, or maternal infection, respectively (Table 3).

Regarding the medical history of the respondent, 98.1% of them were not diagnosed with autism, 95.5% had no history of ear discharge and 93.7% had no history of oropharyngeal deformity. However, 56.5% of them had a history of seizures (Table 4).

Most parents (79.9%) spent more than 12 hours with their kids. In line with this, 50.6% of children had more than 1 hour of average screen time. Furthermore, 63.6 percent of children's parents were bilingual, and only 9.3 percent of parents had a history of speech delay (Table 5).

Table 1. Selected background characteristics of the family of the study participant among under five children seen at pediatric neurology clinic of St. Paul's Hospital, Addis Ababa, Ethiopia, 2022 (N=269).

Characteristic	Frequency (Median ¹)	Percentage (IQR ¹)
Maternal age at birth	29.2 ¹	(25.0, 35.0) ¹
Maternal age at birth category	<19yrs	8 3.00%
	19-34yr	179 66.50%
	+35yr	82 30.50%
Age of father at birth	32	(28.0-37.0)
	<19yrs	0 0
Category of father age at birth	19-34yr	167 62.1%
	+35yr	102 37.2%
	Religion	
Religion	Orthodox	126 47.6%
	Muslim	84 31.2%
	Protestant	52 19.3%
	Catholic	5 1.9%
Residence	Urban	203 75.5%
	Rural	66 24.5%
	Educational status	
Educational status	Illiterate	56 20.8%
	Primary	117 43.5%
	Secondary and above	96 35.7%
Socio economic status	Lower-class	141 52.4%
	Middle-class	82 30.5%
	Upper-class	46 17.1%
Family size	>=5	107(59.8%) 55(61.1%)
	=<4	72(40.2%) 35(38.9%)

Table 2. Selected background characteristics under-five children seen at pediatric neurology clinic of St. Paul's Hospital, Addis Ababa Ethiopia 2022 (N=269).

Characteristic	Frequency	Percentage
Sex	Female	137 50.9%
	Male	132 49.1%
Age category	12-18 month	53 19.7%
	19-24 month	10 3.7%
	25-30 month	38 14.1%
	31-36 month	28 10.4%
	37-42 month	44 16.4%
	43-48 month	26 9.7%
	49-54 month	42 15.6%
Child lives with	55-59 month	28 10.4%
	With parents	262 97.4%
Birth of weight	Caregiver	7 2.6%
	<2.5 Kg	34 12.6%
	2.5_4 Kg	224 83.3%
Gestational Age	>4 Kg	11 4.1%
	Term	240 89.2%
	Preterm	29 10.8%

Table 3. A selected medical history of mothers of under-five children seen at pediatric neurology clinic of St. Paul's Hospital, Addis Ababa Ethiopia 2022 (N=269).

Characteristic	Frequency	Percentage
History of maternal infection	Yes	24 8.9%
	No	245 91.1%
History of prolonged labor of more than >24	Yes	30 11.2%
	No	239 88.8%
History rupture of members for more than 18	Yes	14 5.2%
	No	239 88.8%
History of preeclampsia	Yes	101 37.5%
	No	168 62.5%
History of chronic diseases	Yes	32 11.9%
	No	237 88.1%
History of substance	Yes	1 0.4%
	No	268 99.6%
History of intrauterine fetal death	Yes	8 3.0%
	No	261 97.0%
History of asphyxia	Yes	52 28.6%
	No	192 71.4%

Table 4. A selected medical history of the under-five children seen at pediatric neurology clinic of St. Paul's Hospital, Addis Ababa Ethiopia 2022 (N=269).

Characteristic	Frequency	Percentage
Diagnosis with autism	Yes	5 1.9%
	No	264 98.1%
History of seizure	Yes	152 56.5%
	No	117 43.5%
History of oropharyngeal deformity	Yes	17 6.3%
	No	252 93.7%
History of ear discharge	Yes	12 4.5%
	No	257 95.5%
History of hearing impairment	Yes	104 38.7%
	No	165 61.3%

Table 5. Social and environmental exposure related to language and speech delay among under five children seen at pediatric neurology clinic of St. Paul's Hospital, Addis Ababa Ethiopia 2022 (N=269).

Characteristic	Frequency	Percentage
Parents spending hours with their kids	=<6hr	40 14.9%
	6-12hr	14 5.2%
	=>12hr	215 79.9%
Exposure to environmental noise	Yes	44 16.4%
	No	225 83.6%
Average screen hour	>1hrs	136 50.6%
	<=1hrs	133 49.4%
Family history of speech delay	Yes	25 9.3%
	No	244 90.7%
Family with bilingual ability	Yes	171 63.6%
	No	98 36.4%

Incidence of isolated speech and language delay

Per the assessment criteria, the overall incidence of isolated speech and language delay was 66.5% with a range of 95%CI (55.1%-74.2%) (Figure 1).

Associated factors of isolated speech and language delay

In Bi variable analysis, urban residence, male gender, preeclampsia,

■ With speech delay ■ without speech delay

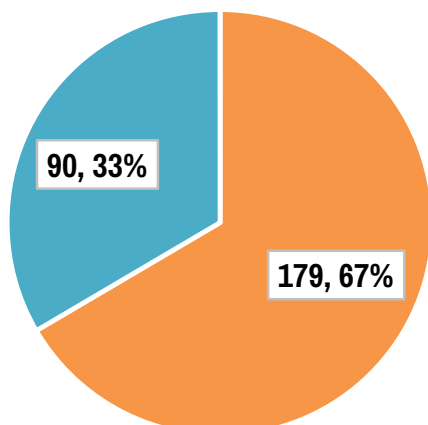


Figure 1. Incidence of isolated language and speech delay by a specific age group, among under five children seen at pediatric neurology clinic of St. Paul's Hospital, Addis Ababa Ethiopia 2022.

history of seizure, birth asphyxia, screen time, family history of hearing impairment and bilingual family member were associated with language and speech delay (Table 6).

In multivariate analysis, the following variables showed statistically significant associations: The study participants who have a bilingual family member were 4.2 times (AOR=4.2, 95% CI (2.22–7.943) more likely to develop an isolated language and speech delay compared to those with a monolingual family member. Also, being male makes you 4.13 times (AOR=4.13, 95% CI (2.17–7.94) more likely to have a speech and language delay compared to being female.

Children who has history of seizure was found 2.01 times (AOR=4.13, 95%CI.1.07-3.78) and history of hearing impairment has 2.76 times more (AOR=2.76, 95%CI.1.44-5.29) likely to developed isolated language and speech delay than those who doesn't have.

Those respondents with a maternal history of preeclampsia during ANC follow-up, labor, and delivery are 2.03 times (AOR= 2.03, 95% CI: 1.04-3.98) more likely to have language and speech delays than those with no maternal history of preeclampsia. Furthermore those with history of postnatal asphyxia was 2.81 more (AOR=2.81, 95% CI: 1.35-5.86) likely of having language and speech delay.

The other variable that has identified with strong correlation is screen time those respondents with average screen time of more than one hour was found twice (AOR=2.36, 95% CI: 1.24-4.47) more likely to have isolated language and speech delay than those with screen time less than or equal to one hour (Table 7).

Discussion

There have been extensive studies on speech and language delay in Africa, Asia, and Western literature. However, there is no similar data from our country. We found the prevalence of speech delay to be 66.5% in children attending pediatric neurology clinics. This appears to be high as compared to the prevalence described by other authors, which is 5–12% [1-4]. The highest prevalence in our setting may be due to the following two reasons: Firstly, the prevalence of speech and language delays depends to a large extent on the tool used. Our study used the language scale Trivaderum, which is easy to administer, can be completed quickly in a busy clinic, and has a high sensitivity of 96%. The second reason is that since our study was conducted in a neurology clinic, there are multiple risks present in the target population that may influence their language and speech development as compared to other studies that are done in the outpatient department [1-4].

Table 6. Predictor-isolated speech and language delay using bi-variable analysis among under five children seen at pediatric neurology clinic of St. Paul's Hospital, Addis Ababa Ethiopia 2022.

Variables	Category	With Speech Delay (%) (n=179)	Without Speech Delay (%) (n=90)	Crude Odd Ratio(95%CI)	P value
Age group	12-18 month	37(20.7%)	16(17.8%)	1.08(0.39-2.96)	0.88
	19-24 month	8(4.5%)	2(2.2%)	0.63(0.11-3.61)	0.60
	25-30 month	22(12.3%)	16(17.8%)	1.82(0.64-5.16)	0.26
	31-36 month	20(11.2%)	8(8.9%)	1.00(0.31-3.19)	1.00
	37-42 month	31(17.3%)	13(14.4%)	1.05(0.37-2.98)	0.93
	43-48 month	16(8.9%)	10(11.1%)	1.56(0.50-4.88)	0.44
	49-54 month	25(14.0%)	17(18.9%)	1.70(0.61-4.74)	0.31
	55-59 month	20(11.2%)	8(8.9%)	1.08(0.39-2.96)	0.88
Religion	Christian	124(69.3%)	61(67.8)	1.07(0.62-1.85)	0.80
	Muslim	55(30.7%)	29(32.2%)	1	-
Residence	Urban	129(72.1%)	74(82.2%)	0.56(0.30-1.05)	0.07
	Rural	50(27.9%)	16(17.8%)	1	-
Sex of the children	Male	106(59.2%)	31(34.4%)	2.76(1.63-4.68)	<0.0001
	Female	73(40.8%)	59(65.6%)	1	-
Gestational age	Term	157(87.7%)	83(92.2%)	0.60(0.25-1.47)	0.264
	Preterm	22(12.3%)	7(7.8%)	1	-
Family Income	Lower class	97(54.2%)	44(48.9%)	0.65(0.32-1.28)	0.210
	Middle class	55(30.7%)	27(30.0%)	0.70(0.33-1.47)	0.344
	Upper class	27(15.1%)	19(21.1%)	1	-
History of preeclampsia	Yes	77(43.0%)	24(26.7%)	2.08(1.19-3.61)	0.01
	No	102(57.0%)	66(73.3%)	1	-
Family size	≥5	107(59.8%)	55(61.1%)	0.95(0.56-1.59)	0.833
	≤4	72(40.2%)	35(38.9%)	1	-
History of seizure	Yes	114(63.7%)	38(42.2%)	2.40(1.43-4.03)	0.001
	No	65(36.3%)	52(57.8%)	1	-
History of asphyxia	Yes	61(34.1%)	16(17.8%)	2.39(1.28-4.46)	<0.0001
	No	118(65.9%)	74(82.2%)	1	-
Average screen time	>1hrs	104(58.1%)	32(35.6%)	2.51(1.49-4.24)	0.001
	≤1 hrs	75(41.9%)	58(64.4%)	1	-
Family history of speech delay	Yes	17(9.5%)	8(8.9%)	1.08(0.45-2.60)	0.871
	No	162(90.5%)	82(91.1%)	1	-
Family with bilingual	Yes	130(72.6%)	41(45.6%)	3.17(1.87-5.38)	<0.0001
	No	49(27.4%)	49(54.4%)	1	-
Hearing impairment	Yes	78(43.6%)	26(28.9%)	1.90(1.10-3.27)	0.02
	No	101(56.4%)	64(72.1%)	1	-

Our study found a higher incidence of speech-language delay in males. There are other studies with similar findings that attribute it to the slower maturation of the central nervous system among boys and also to the influence of testosterone, which stops cell death and makes proper connections difficult for language and speech delay [2,4].

A study done one year back, at University of Virginia School of Medicine stated that children growing up in a bilingual environment will typically have some degree of mixing of the two languages, which decreases with a growth in language and speech development [6]. Similarly, our study showed that those with bilingual family members have an increased risk of developing speech and language delays. Other studies done in India and Turkey also showed that a multilingual home environment, commonly seen in these countries, is a common cause of confusion for a child during the early stages of learning a language [4,7].

The recent study showed more than half the respondents has history of seizure with significant correlation with isolated language and speech delays. The hypoxic insult to the brain during a seizure could prove detrimental in various areas of development and can manifest as speech and language delay. This effect of relation were seen in different other studied too [4]

Table 7. Predictor-isolated speech and language delay using multivariable analysis among under five children seen at pediatric neurology clinic of St. Paul's Hospital, Addis Ababa, Ethiopia, 2022.

Variables	Category	With Speech Delay (%) (n=179)	Without Speech Delay (%) (n=90)	Adjusted Odd Ratio(95%CI)	P value
Sex of the children	Male	106(59.2%)	31(34.4%)	4.13(2.15-7.93)	<0.0001
	Female	73(40.8%)	59(65.6%)	1	
History of preeclampsia	Yes	77(43.0%)	24(26.7%)	2.03(1.04-3.98)	0.04
	No	102(57.0%)	66(73.3%)	1	-
History of seizure	Yes	114(63.7%)	38(42.2%)	2.01(1.07-3.78)	0.03
	No	65(36.3%)	52(57.8%)	1	-
History of asphyxia	Yes	61(34.1%)	16(17.8%)	2.81(1.35-5.86)	0.006
	No	118(65.9%)	74(82.2%)	1	-
Average screen time	>1hrs	104(58.1%)	32(35.6%)	2.36(1.24-4.47)	0.009
	≤1 hrs.	75(41.9%)	58(64.4%)	1	-
Family with bilingual	Yes	130(72.6%)	41(45.6%)	4.20(2.22-7.94)	<0.0001
	No	49(27.4%)	49(54.4%)	1	-
Hearing impairment	Yes	78(43.6%)	26(28.9%)	2.76(1.44-5.29)	0.002
	No	101(56.4%)	64(72.1%)	1	

This study showed that isolated language and speech delays were more common in children with a maternal history of preeclampsia and postnatal asphyxia, which is similar to the finding of a study conducted in India [4]. This might be due to two factors. The first one is preeclampsia is one of a risk factor for a prematurity deliver. However there is no significant correlation in prematurity and isolated language and speech delay in our study, a study done in University of Santiago reported a significant relation between healthy premature children and language and speech delay [8]. The second factor is preeclampsia, which is one of the risk factors for the development of asphyxia, which is a significant risk factor for isolated speech and language delay or global developmental delay attributable to many factors, one of which being increased risk of epilepsy.

The American Academy of Pediatrics does not recommend television watching for children younger than two years of age. Language and speech delays are more frequently encountered in children who have grown up passing time with electronic media such as watching television, chatting on the phone, surfing on a tablet, and using the internet because of the limited time they have for interactive communication with their peers and families. A study done in Turkey showed a strong association between average screen time and the development of language and speech delays. It states that uncontrolled periods of TV watching in small children result in a risk for TV dependency when they reach school age. In addition, passing the stage of play, this is one of the most important developmental stages of childhood, in front of the TV or using electronic instruments for longer periods of time increases the risk of encountering developmental delays in the years to come. These exposures increase the rate of observing adversities in personal and social communication and language skills [7]. Similarly our study showed a significant correlation in those children who has average screen time exposure of more than one hour.

A study done in USA showed that a strong relation between hearing loss and language and speech delay similar to our study. The study reveals that hearing loss affects a child's ability to establish the correct allophones for some stop and fricative consonants [9].

Conclusion

Isolated speech and language delays were found in more than two thirds of children in the neurology clinic, which is very high as compared to other studies. The environmental and medical conditions that have been identified as associated factors are: bilingual family members, average screen time, male sex, and a history of seizure and hearing impairment. History of asphyxia and preeclampsia were antenatal and postnatal associated factors identified with the development of isolated language delay. Since the prevalence of isolated speech and language delays is high, a speech therapist should be included in

the care of these children, and further studies should be done at units other than the neurology clinic.

Declaration

Ethical consideration

Before the actual data collection started, permission and ethical clearance was obtained from the SPHMMC review board (IRB) and department of pediatrics child health. All the study participants' family and caregivers were informed about the purpose of the study and verbal informed consent was taken from all of them.

Data Availability Statement

The data and tool used in this manuscript is available with email contact of the corresponding authors.

Acknowledgement

First of all I would like to thank the almighty God for making everything possible would like to offer. I would also like to thank the pediatric department, the research office, and SPHMMC. Our heartfelt thanks also go to all the data collectors for their valuable contribution to the realization of this study.

References

- Raju, Arunkumar. "A study of prevalence and factors associated with language delay among 0-3 year old children in a tertiary teaching hospital." (2020).
- Mondal, Nivedita, B. Vishnu Bhat, Nishad Plakkal and Mahalakshmy Thulasigam, et al. "Prevalence and risk factors of speech and language delay in children less than three years of age." *J Compr Ped* 7 (2016).
- Van der Linde, Jeannie, De Wet Swanepoel and Jaqui Sommerville, et al. "Prevalence and nature of communication delays in a South African primary healthcare context." *S Afr J Child Health* 10 (2016): 87-91.
- Sunderajan, Trisha and Sujata V. Kanhere. "Speech and language delay in children: Prevalence and risk factors." *Fam Med Prim* 8 (2019): 1642.
- Fan, Shengfu, Ying Zhang, Jiangbo Qin and Xuan Song, et al. "Family environmental risk factors for developmental speech delay in children in Northern China." *Sci Rep* 11 (2021): 1-7.
- McLaughlin, Maura R. "Speech and language delay in children." *Am Fam Physician* 83 (2011): 1183-1188.

7. Jullien, Sophie. "Screening for language and speech delay in children under five years." *BMC Pediatr* 21 (2021): 1-7.
8. Yasin, Ahmet, Hatice Aksu, Erdoğan Özgür and Börte Gürbüz Özgür. "Speech and language delay in childhood: A retrospective chart review." *ENT Updates* 7 (2017).
9. Syamsuardi, Syamsuardi. "Speech delay and its affecting factors (Case study in a child with initial aq)." *J Ed* 6 (2015): 68-71.

How to cite this article: Menbere, Fasil, Zenawit Alemayehu and Yohannes Godie. "Prevalence and Factors Associated with Isolated Language Delay in under Five Pediatrics Patients who have follow up at Neurology Clinic of Saint Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2022: A Cross-Sectional Prospective Study." *J Pediatr Neurol Med* 8 (2023): 221.