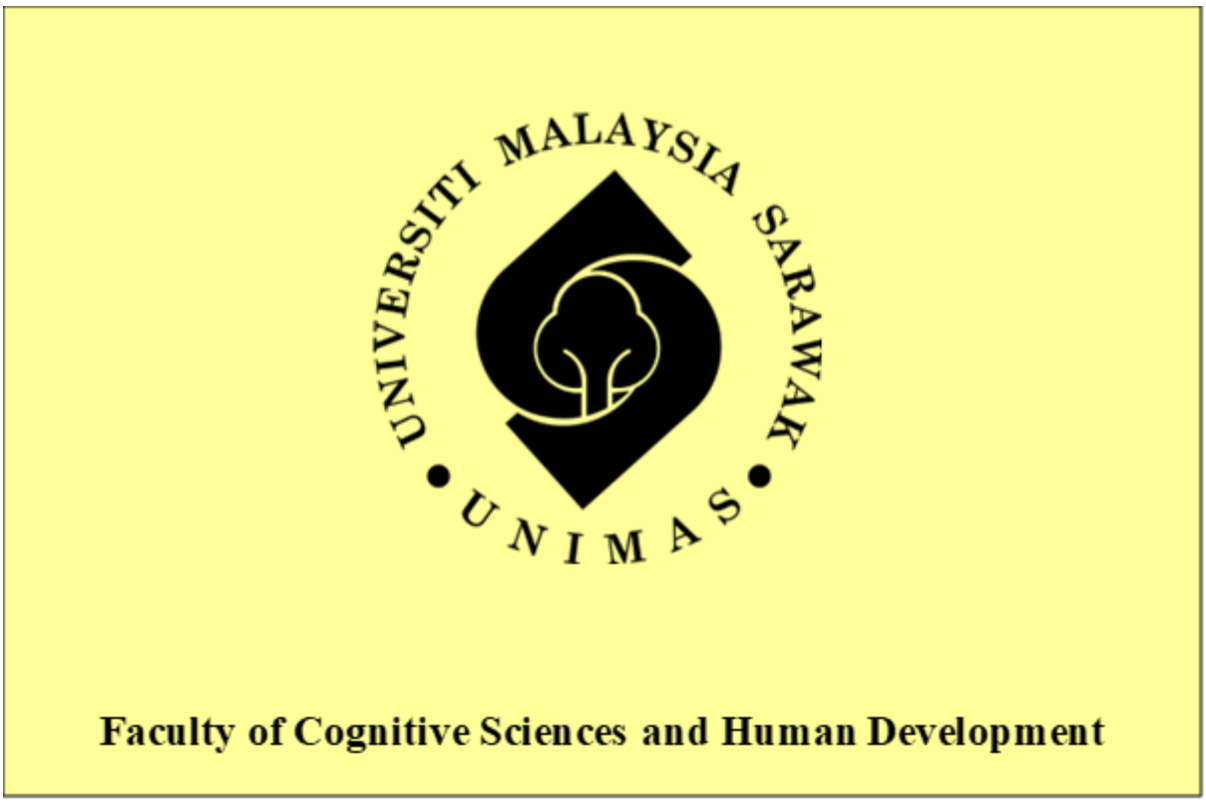

PREVALENCE AND RISK FACTORS OF LANGUAGE DELAY IN CHILDREN: A COMPREHENSIVE REVIEW

Fiorencia Culla Anak Sengeleng

Bachelor of Science with Honours (Cognitive Science)
2022

UNIVERSITI MALAYSIA SARAWAK

Grade: A-

Please tick one

Final Year Project Report ☒

Masters ☐

PhD ☐

DECLARATION OF ORIGINAL WORK

This declaration is made on the 5 day of JULY year 2022.

Student's Declaration:

I, FIORENCIA CULLA ANAK SENGELENG, 73034, FACULTY OF COGNITIVE SCIENCES AND HUMAN DEVELOPMENT, hereby declare that the work entitled, PREVALENCE AND RISK FACTORS OF LANGUAGE DELAY IN CHILDREN: A COMPREHENSIVE REVIEW is my original work. I have not copied from any other students' work or from any other sources with the exception where due reference or acknowledgement is made explicitly in the text, nor has any part of the work been written for me by another person.

5 JULY 2022

FIORENCIA CULLA (73034)

Supervisor's Declaration:

I, DR. JULIA LEE AI CHENG , hereby certify that the work entitled, PREVALENCE AND RISK FACTORS OF LANGUAGE DELAY IN CHILDREN: A COMPREHENSIVE REVIEW was prepared by the aforementioned or above mentioned student, and was submitted to the "FACULTY" as a *partial/full fulfilment for the conferment of BACHELOR OF SCIENCE WITH HONOURS (COGNITIVE SCIENCE), and the aforementioned work, to the best of my knowledge, is the said student's work

Received for examination by: Jlee (DR. JULIA LEE AI CHENG) Date: 10-7-2022

I declare this Project/Thesis is classified as (Please tick (√)):

☐ **CONFIDENTIAL** (Contains confidential information under the Official Secret Act 1972) *****

☐ **RESTRICTED** (Contains restricted information as specified by the organisation where research was done) *****

☒ **OPEN ACCESS**

I declare this Project/Thesis is to be submitted to the Centre for Academic Information Services (CAIS) and uploaded into UNIMAS Institutional Repository (UNIMAS IR) (Please tick (√)):

☒ **YES**
☐ **NO**

Validation of Project/Thesis

I hereby duly affirmed with free consent and willingness declared that this said Project/Thesis shall be placed officially in the Centre for Academic Information Services with the abide interest and rights as follows:

- This Project/Thesis is the sole legal property of Universiti Malaysia Sarawak (UNIMAS).
- The Centre for Academic Information Services has the lawful right to make copies of the Project/Thesis for academic and research purposes only and not for other purposes.
- The Centre for Academic Information Services has the lawful right to digitize the content to be uploaded into Local Content Database.
- The Centre for Academic Information Services has the lawful right to make copies of the Project/Thesis if required for use by other parties for academic purposes or by other Higher Learning Institutes.
- No dispute or any claim shall arise from the student himself / herself neither a third party on this Project/Thesis once it becomes the sole property of UNIMAS.
- This Project/Thesis or any material, data and information related to it shall not be distributed, published, or disclosed to any party by the student himself/herself without first obtaining approval from UNIMAS.

Student's signature: _____ Supervisor's signature: _____

Date: 5 JULY 2022 Date: 10-7-2022

Current Address:
RUMAH ANYAI SUNGAI SAEH PUTIH,
98200 NIAH SARAWAK

Notes: ***** If the Project/Thesis is **CONFIDENTIAL** or **RESTRICTED**, please attach together as annexure a letter from the organisation with the date of restriction indicated, and the reasons for the confidentiality and restriction.

PREVALENCE AND RISK FACTORS OF LANGUAGE DELAY IN CHILDREN: A COMPREHENSIVE REVIEW

FIORENCIA CULLA ANAK SENGELENG

This project is submitted
in partial fulfilment of the requirements for a
Bachelor of Science with Honours
(Cognitive Science)

Faculty of Cognitive Sciences and Human Development
UNIVERSITI MALAYSIA SARAWAK
(2022)

The project entitled 'Prevalence and risk factors of language delay in children: a comprehensive review' was prepared by Fiorencia Culla Anak Sengeleng and submitted to the Faculty of Cognitive Sciences and Human Development in partial fulfillment of the requirements for a Bachelor of Science with Honours (Cognitive Science).

Received for examination by

Jlee

(ASSOCIATE PROFESSOR DR JULIA LEE AI CHENG)

Date:

10-7-2022

Grade
A-

ACKNOWLEDGMENTS

First and foremost, praise and thank the Almighty, for His showers of blessings throughout my work to be completed successfully.

I would like to express my deep and sincere gratitude to my supervisor, AP Dr. Julia Lee Ai Cheng, for providing invaluable guidance throughout this project. Her dynamism, vision, sincerity, and motivation have deeply inspired me. She has taught me the methodology to carry out the project and to present the works as clearly as possible. It was a great privilege and honor to work and study under her guidance. I am extremely grateful for what she has offered me. I would also like to thank her for her friendship, empathy, and great sense of humor. I am extending my heartfelt thanks to her family for their acceptance and patience during the discussion I had with her on project work and the preparation.

I am extremely grateful to my parents for their love, prayers, care, and sacrifices in conducting and preparing me for my future. I am very much thankful to my family for their love, understanding, prayers, and continuing support to complete this project work.

Finally, my thanks go to all the people who have supported me to complete the project work directly or indirectly.

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

Language delays are relatively common. Children experience language delay when they do not meet the language developmental stages for their age. Their linguistic skills maybe develop at a slightly slower pace than those of other youngsters. They may struggle to express themselves or socialize with other people. Hearing, speech, and cognitive issues might all contribute to their delay. Language delays differ from speech delays, which occur when the mechanical and motor parts of speech production take longer to mature. Many people mix up language delay with speech delay or just late talker. There are distinct tell-tale indications and deciding variables for each of these. Language is a medium of communication, and speech is the verbal motor production of language. Because language and speech are separate, they may be delayed separately. For example, a child's speech may be delayed (i.e., they are unable to generate comprehensible speech sounds), but their language is not delayed since they utilize Sign Language. Furthermore, language delay refers to the slower advancement of all areas of language development, not simply speaking. The following is a comprehensive review of over 50 articles investigating the prevalence and risk factors of language delay in children. Articles published between 2000 and 2022 were found using the keywords “early intervention”, “late bloomers”, “language delay”, “risk factors of language delay”, “the late talker”, and “prevalence of language delay among children” and “language development in children”. This review provides an overview of the literature on prevalence and risk factors of language delay in children and suggestions treatments or ways to avoid or at least minimize the factors of language delay in children.

Keywords: early intervention, late bloomers, language delay, risk factors of language delay, the late talker, prevalence of language delay among children, and language development in children.

CHAPTER ONE: INTRODUCTION

The development of a child's language is essential. The social connections, attitude, and intellectual capacity of a kid are all influenced by the language development of that child. Language development helps many other aspects of growth, including cognitive, social, and language development. Language is created by sounds and movements, which are subsequently followed by words and phrases. By conversing with their kids frequently and responding to what they say, parents may aid in their language development.

Parents commonly mistakenly believe that their young child's lack of communication is due to shyness, which is not always the case. However, owing to a more serious issue, some children's language development is delayed. If the youngsters do not fulfill the language developmental targets for their age, they may have a language delay. Their verbal talents may develop at a slower rate than other children's. They may have trouble communicating with and understanding people. According to reports, these youngsters do not talk as well as other children their age (Leung & Kao, 2000). On reflection, there is fear that these youngsters may have learning challenges, which might have a negative influence on their future. In a study done in Malaysia by Tan and Yadav (2008), 68 children with disabilities out of 900 were found to have language delays. A language delay occurs when a kid has difficulties understanding and/or using spoken language. These are uncommon problems for a youngster of this age. Communication breakdowns are common. 5 to 10% of preschool-aged children have delayed language development, according to the University of Michigan Health System (2017).

Seefeldt and Wasik (2006) found that children between the ages of 3 and 5 showed rapid language development in terms of word competency. At the age of three, children may master 900-1000 words, and by the age of four, they can master 4000-6000 words. Children's vocabulary can grow by as much as 5000-8000 words by the age of five. A child is characterized by developmental delay if he or she does not meet average developmental stages by the expected age. Speech is the sound produced, but language reflects thought. The capacity to communicate well is a good measure of a child's intelligence and general development. A speech or developmental language deficit is not the same as a language delay. The term "language delay" refers to a child's difficulty understanding and/or using spoken language.

According to the Centres for Disease Control and Prevention (CDC), language deficiencies are unusual for kids this age (2021). Language difficulties have been connected to Down syndrome, deafness, hearing loss, and autism spectrum disorder (ASD).

Many of these occur naturally. Children's language development happens at varied rates. It may not be possible to tell whether a child has a language delay by comparing them to other kids their same age (Positive Parenting Malaysia, 2018). Children who struggle with language need guidance as soon as possible. Most of the time, it is challenging to pinpoint and anticipate the causes of language delay. The prevalence and risk factors for language delay in children still need to be explained, despite the extensive study on the subject.

RESEARCH OBJECTIVE

This comprehensive review is done to explore:

I. To review the risk factors for language delay in children.

II. To review the prevalence of children with language delay.

RESEARCH QUESTIONS

The following research questions arise from the preceding discussion:

I. What are the risk factors of language delay in children?

II. What is the prevalence of children with language delay?

CHAPTER TWO: METHOD

The most dependable research search engines, PubMed, Scopus, Google Scholar, ScienceDirect, ResearchGate, Psychnet, and APA PsycINFO, were used to find articles utilising the keywords, “early intervention”, “late bloomers”, “language delay”, “risk factors of language delay”, “the late talker”, “prevalence language delay among children” and “language development in children”. Those that investigated the prevalence and risk factors for language delay in children published from the years 2000 to 2022 were selected for review. In total, 30 articles met the search criteria. The following is a comprehensive review of over 50 articles investigating the prevalence and risk factors of language delay in children. Out of 30 articles selected, a total of fifteen articles identified the risk factors for language delay in children and were included in Table 1. Meanwhile, another fifteen articles identified the prevalence of children with language delay were included in Table 2. The other article identified common information about language delay in children.

TABLE 1. LITERATURE SEARCH FOR RISK FACTORS FOR LANGUAGE DELAY IN CHILDREN

Type	Article	Age Group	Learning Disability	Issue
Descriptive cross-sectional study	Nivedita et al. (2016)	Children (Less than three years of age)	Speech and Language Delay	Childhood speech and language delay prevalence and risk factors.
A prospective cohort study: secondary data retrieving	Suzanne et al. (2009)	Children aged 2 years	Language delay	Early language delay and children's risk factors.
Aggregation study	Naseem, C. (2003)	Children	None (Language development)	The influence of family history and another risk factors on language development
Cross-sectional descriptive study	Premkumar et al. (2017)	Children up to 6 years of age	Language delay	There are biological and environmental risk factors linked to the incidence of language delay in young children.
Population-based study	Pirjo, K. et al. (2016)	Children (up to 36 months years old)	Language delay	Identification of biological and environmental risk factors for language delay
Review/Statistical analysis	Philip, W. et al. (2013)	Children	Language delay	Children health
Experimental	Karen et al. (2003)	Children (Twins)	Mild language delay	the causes of mild language delay
Prospective population study	Wren et al. (2012)	Children	Speech disorder	Distinguishing groups of children with persistent speech disorder

Experimental	Smith et al. (2012)	Children (preschool)	None (Language and motor abilities)	Behavioural and kinematic indices of nonword repetition performance
Experimental	Messer et al. (2016)	Children	Language impairments	The relation between executive functioning, reaction time, naming speed, and single word reading in children with typical development and language impairments
A pilot study	Sheeran et al. (2021)	Children	None (Developmental delay)	Enablers and barriers to identifying children at risk of developmental delay
Literature search	Camp et al. (2010)	Adolescence	None (Developmental)	Relationship between the cognitive environment and vocabulary development during the second year of life
A pilot study	Simpson (2000)	Children	Dyslexia	A developmental language disorders
A longitudinal study	Dahlgren (2006)	Children (6-12 years old)	Speech impairments	Reading and spelling abilities in children with severe speech impairments and cerebral palsy at 6, 9, and 12 years of age in relation to cognitive development
Review/Statistical analysis	Kavé (2006)	Children (8-17 months)	None (Child development)	The development of naming and word fluency

TABLE 2. LITERATURE SEARCH FOR THE PREVALENCE OF CHILDREN WITH LANGUAGE DELAY

Issue	Article	Type	Aim	Findings
Developmental characteristics of children with language delay in Zhejiang province, China	Dan, Y. et al. (2020)	Experimental	There were 1,113 children between the ages of one and four who complained about S-S was used to measure inadequate language abilities in language competency. These youngsters. The patients identified with language deficits were separated into six groups, each with its own set of challenges. a six-month age gaps Each group's developmental features were examined analyzed and described.	Language problems were most prevalent in children from 18 to 36 months, with males in each age group being more susceptible than girls. The proportion of children with a poor communication attitude did not differ significantly between the groups. The older the cohort, the larger the proportion of fundamental learning ability anomalies. The cut-off age for a qualitative boost in the proportion of essential learning capacities was two years old. The proportion of persons with reduced language comprehension increased as people became older in each category. For qualitative leaps in the proportion of language knowledge, the cut-off ages were 1.5 and 2 years old, respectively.
Speech and language delay in children	Maura, R.M. (2011)	Literature search	The study focuses on speech and language delays in children, which are linked to difficulties in reading, writing,	Language delay is claimed to affect between 2.3 and 19 percent of children aged two to seven years. Severe

			attention, and sociability. There is inadequate data to indicate whether formal screening tools should be used routinely in primary care to detect speech and language deficits.	speech and language problems in young children may have a major influence on later scholastic success, even with extensive care. According to various research, children with speech and language deficits between the ages of two and a half and five had more difficulty reading in primary school. Attention and social issues are more common in children with speech and language deficits who are older than five and a half years.
High prevalence/low severity language delay in preschool children born very preterm	Susan, H. et al. (2010)	Experimental	To examine the language growth of a geographically representative group of kids who were born extremely prematurely at the appropriate age of four (VPT). It was particularly interesting to identify biological, socioenvironmental, and developmental risk and protective factors that affect the early language development of VPT children.	By the age of four, VPT kids had less receptive and expressive language development than full-term kids. The discrepancies were maintained after accounting for the effects of social risk and excluding children with neurosensory impairment. The primary predictors of overall language development in the VPT group were the degree of white matter abnormalities on new-born magnetic resonance imaging (p =.49), observed parent-child

				synchrony (p =.001), and contemporaneous child cognitive ability (p =.001). When these factors were combined, they explained 45 percent of the difference in the children's overall Clinical Evaluation of Language Fundamentals-Preschool scores.
Speech and language delay in children: Prevalence and risk factors	Sunderajan, T. & Kanhere, S.V. (2019)	Cross-sectional study	To research the prevalence and risk factors of speech-language delay among children aged 1-12 years.	During the research period, 1658 children aged 1 to 12 years visited the paediatric outpatient clinic. There were 42 children (2.53%) with speech and language delays in total. One of the children was autistic, another had cerebral palsy, and yet another had hearing loss as a co-morbidity.
Prevalence and natural history of primary speech and language delay: findings from a systematic review of the literature	James, L. et al. (2000)	Systematic review	The findings are explored in terms of the necessity to create a prevalence model based on the likelihood of future challenges.	The group most usually identified in the papers evaluated is language delay without speech delay. Children with expressive or receptive delays have been grouped in certain studies. There is a significant range of variability here, with a range of 2.02–19%. According to the research, it does not appear to make a significant difference in

				which strategy is taken. It's also possible that at the 5-year mark, expectations shift and a closer approximation to the adult norm is expected, increasing the number of potential causes.
Toddlers with delayed expressive language: An overview of the characteristics, risk factors, and language outcomes	Hawa, V. V. & Spanoudis, G. (2014)	Review	Examining the elements that appear to contribute to late talkers' delayed onset and advancement. Examining the features of late talkers' families and parents, as well as their linguistic qualities. The relationship between expressive language delay and late talkers' social-emotional development is discussed. Clinical practice recommendations and linguistic outcomes of late talkers at a later stage of development.	The parental and individual features of this group of children, as well as the risk factors for late speech. It also covers how late talkers' behaviour and socioemotional development are affected by their delayed expressive language, as well as the language outcomes of late talkers as they become older. This review concludes with clinician-friendly suggestions and intervention strategies.
Learning words' sounds before learning how words sound: 9-Month-olds use distinct objects	Yeung, H. H., & Werker, J. F. (2009)	Experimental	Phoneme, Phonetic learning, Categorization, Discrimination, Perception, Language acquisition	In a perceptual discrimination test, 9-month-old English-learning infants performed below-averagely, failing to distinguish between two

as cues to categorize speech information				non-native phonetic categories. In Experiment 2, these babies were successful at discriminating after viewing opposing visual signals (i.e., films of two novel items matched consistently with one another) - but not with one another. The findings show that new-borns learn native-language phonetic systems through cross-modal connections formed in social environments.
Twins as a natural experiment to study the causes of mild language delay	Rutter, M., Thorpe, K., & Greenwood, R. (2003)	Experimental study	Parents and children who were twins were compared to singletons who were no more than 30 months apart in age. At 20 months and 36 months, parental traits and family interaction were measured using standardized questionnaires and interviews, as well as organized and unstructured observations in the home. Five criteria were used to analyze the potential involvement of postnatal family effects on language and other postnatal characteristics.	These five criteria were satisfied by patterns of parent-child contact and communication. All the maternal variables addressed parts of engagement that were broadly connected with communication: encouraging the kid to speak, making elaborative remarks, reading to the child, and discussing the narrative and its images. The outcomes of the HOME inventory were comparable in terms of responsiveness, participation, and degree of experience. Parental depression, breastfeeding, family size, and sibling

				interaction style were all factors that may have been important but were not.
Children with developmental language delay at 24 months of age results in a diagnostic work-up	Buschmann, A., et al. (2008)	Experimental study	The goal of this research was to see if a diagnostic work-up for 2-year-old children with developmental language delay (LD) should be indicated.	The language ability and nonverbal cognitive development of 100 children with LD (65 males, 35 females; mean age 24.7month and a control group of 53 children with normal language development were assessed using a standardized A variety of neurological and audiometric tests were also carried out. Sixty-one percent of those with LD had expressive LD, whereas seventeen percent had distinct receptive-expressive LD.
Sex differences in childhood language and brain development.	Etchell, A., et al. (2018)	Systematic literature review	It is hoped that this study will provide normative data that may be applied to studies into neurodevelopmental disorders that mostly affect males rather than girls and have an impact on language development.	The disparities between boys and girls are not as pronounced or as substantial as previously believed. Differences in brain structure and function between boys and girls do not necessarily translate into behavioural differences. Sex differences are frequently intertwined with a variety of other

				variables, including age and brain area.
Sex differences in white matter pathways related to language ability	Jung, M., et al. (2015)	Functional imaging studies	to compare the white matter (WM) pathways of male and female adult volunteers with similar IQs about their language abilities	Male children have a higher rate of language delay than female children, which might be attributed to the central nervous system's sluggish development and testosterone's effect.
Sex hormones in early infancy seem to predict aspects of later language development	Schaadt, G., Hesse, V., & Friederici, A. D. (2015)	Systematic review	to correlate sex hormones (e.g., testosterone/oestradiol) to language performance and brain differences	Research on the impact of early postnatal sex hormone concentration on a child's subsequent language development is scarce. This study investigates the neurophysiological phonemic discrimination and language development of boys and girls at 5 months of age in relation to testosterone and oestradiol. Researchers discover a significant positive impact of oestradiol and a detrimental impact of testosterone on language development beyond the age of four.
Sex differences in early communication development: behavioral and neurobiological	Adani, S., & Cepanec, M. (2019)	Review	To demonstrate the differences in language and normal communication development between males and girls as well	Male and females, as a group, tend to demonstrate systematic disparities in communication and language talents, despite

indicators of more vulnerable communication system development in boys			as the prevalence of communication-related neurodevelopmental problems The data from the field of neuroscience that may provide light on the neurological processes that could contribute to the explanation of this phenomena is given particular attention.	substantial interindividual variances that persist independent of the individual's sex. The natural development of communication skills in girls is faster and more advanced than in boys. It takes years to learn a language or develop communication skills, and the environment plays a profound role in the development of these skills.
Screening for Speech and Language Delay in Children 5 Years Old and Younger	Wallace, I. F., et al. (2015)	Systematic review	Seeks to revise the information on diagnosing and treating speech and language impairments in children since the US Preventive Services Task Force's comprehensive assessment in 2006.	Sensitivity ranged from 50% to 94 percent in 23 studies testing the accuracy of screening instruments, whereas specificity varied from 45 percent to 96 percent. Twelve treatment trials improved language, articulation, and stuttering results; however, there was no evidence that treatments benefited other outcomes or that therapy had negative side effects. Male gender, family history, and poor parental education were found to be risk factors for speech and language delays. One of the drawbacks of the analysis is the lack of well-designed, well-conducted studies looking

				at whether screening for speech and language delays or abnormalities improves outcomes.
Distúrbios da aquisição da linguagem e da aprendizagem [Language and learning disorders]	Schirmer, C. R., Fontoura, D. R., & Nunes, M. L. (2004)	Review	To help health professionals, particularly pediatricians, diagnose and prevent language and learning issues.	The genesis of language and learning difficulties might be linked to several factors, including neurological conditions. The language delay category has been determined.

CHAPTER 3: FINDINGS - RISK FACTORS FOR LANGUAGE DELAY IN CHILDREN

BIOLOGICAL FACTOR

Children delivered prematurely and via cesarean section showed a substantial link among the biological risk variables evaluated. Foster-Cohen et al. (2007) found a similar result in preterm infants in their study. Children born by assisted delivery had a greater risk of language delay, according to Tresa's 2009 study. Children with a significant birth history showed a large correlation with language delay when compared to those whose postnatal time was unremarkable. Tresa's studies supported this conclusion (2009). At any moment in a child's life, biological factors can affect that child's development, but crucial times like pregnancy and the first few months of life are particularly vulnerable. It is impossible to exaggerate the value of nutrition to a child's overall development. Prior to giving birth, a mother's diet and health are crucial. For instance, taking 400 micrograms (mcg) of folic acid daily for many months before to implantation and during pregnancy lowers the likelihood that a child may be born with certain brain and spine birth defects (spina bifida) (Centers for Disease Control and Prevention, 2018).

Events that take place during pregnancy or childbirth influence a child's brain and, as a result, their ability to properly communicate. For instance, a child is more likely to experience language difficulties later in life if they are born preterm, on time but with a low birth weight, or with insufficient oxygen to the brain. It's also important to keep in mind that some of these problems may have a genetic component. Development language delay (DLD) often runs in families. Thousands of genetic variations exist in each person, all of which can interact to influence how the brain develops (Frota et al., 2016). A kid with DLD may have enough of these DNA alterations impacting areas of the brain that are critical for language. This is referred to as polygenic risk by scientists since it is the result of the interaction of several genes. A child with DLD is less likely to be born to families who do not have this genetic risk for language. In these circumstances, the youngster probably has a serious DNA mutation in a gene involved in brain and language development (Dahlgren, 2006). There is a wealth of phenotypic research on the connection between oral language and literacy, and it is generally agreed that oral language, particularly phonological skills, provide as the basis for reading and other literacy-related abilities. The tight connection between phonology and reading is confirmed by behavioural genetic research, which demonstrates that these two skills are both highly heritable and share significant genetic influences (Hayiou-Thomas, 2008).