

Exploring Dyslexia Risk among Preschoolers: A Prevalence Study in Hulu Langat, Selangor, Malaysia

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ABSTRACT

Objective: The aim of this study is to determine the prevalence of pupils at risk of dyslexia in preschool in the Hulu Langat district, Selangor.

Design: Learning is the process of acquiring new knowledge, skills or attitude. Specific learning disability refers to a disorder in one or more of the fundamental psychological processes. Early identification of pupils at risk for dyslexia is possible as early as preschool in order to prevent delays that may arise in negative consequences and adverse effects of dyslexia at the school level.

Materials and Methods: A cross-sectional study conducted on 127 of six years olds preschoolers who attending preschool using the systematic random sampling. This research employed a 'Dyslexia Screening Test-Junior' instrument, which consists of 12 constructs and categorised based on their scores ranging from very highly at risk, highly at risk, at risk, normal performance, and exceeding normal performance.

Results: The prevalence study revealed 7% of pupils at risk of dyslexia, with most falling in “very highly at-risk” category.

Discussions: This indicates the vital importance of early identification in determining the prevalence of dyslexia risks among preschoolers.

Conclusions: Furthermore, early detection and intervention have a significant impact on students, teachers, and other professionals.

KEY WORDS

dyslexia, prevalence, preschool, identification

INTRODUCTION

Dyslexia is a specific learning disability that is neurobiological in origin. It is characterised by difficulty with accurate and/or fluent word recognition, as well as poor spelling and decoding skills. These difficulties are frequently attributable to a deficiency in the phonological component of language, which is frequently unanticipated in relation to other cognitive skills and the availability of outstanding educational opportunities¹⁾.

Although screening can begin as early as preschool, the diagnostic approach for dyslexia often starts in primary school and has inherent flaws. As a result, children with dyslexia lack receive adequate care and continue to struggle academically. The findings of this prevalence study

highlight the need for a comprehensive diagnostic approach and a formal assessment instrument at the preschool level.

The lack of appropriate instruments for diagnosing dyslexia contributes to low achievement in reading skills²⁾. In this regard, the early detection of pupils at risk of dyslexia can be done as early as preschool, which can be especially beneficial to children as it gives them a chance to receive the same educational opportunities as typical children. At the same time, early detection of dyslexia allows teachers to assess and plan early intervention for at-risk children, which can help improve their academic achievement. This is evident from the prevalence data obtained from different countries, which clearly showed the prevalence of dyslexia in the population of school-going children globally.

Furthermore, according to Hoef³⁾, 5-20% of dyslexic pupils diagnosed at the school level have shown signs and symptoms as early as

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Table 1: Demographic characteristics of the respondents.

Demography	Frequency
Gender	
Male	58 (46%)
Female	69 (54%)
Race	
Malay	125 (98%)
Indian	1 (1%)
Others	1 (1%)
Father's Occupation	
Self-employed	28 (22%)
Government Employee	32 (25%)
Private Employee	66 (52%)
Unemployed	1 (1%)
Mother's Occupation	
Self-employed	14 (11%)
Government Employee	16 (13%)
Private Employee	32 (25%)
Unemployed	65 (51%)
History of Dyslexia	
Have a history of dyslexia in the family	5 (4%)
Have no history of dyslexia in the family	122 (96%)

preschool. Hence, early identification should be carried out to prevent delays that could lead to negative implications and adverse effects of dyslexia at the school level. As dyslexia constitutes difficulties in reading and writing, dyslexic children do not necessarily show symptoms explicitly. Furthermore, past studies stated that the signs and characteristics of dyslexic pupils are only apparent when pupils have difficulty reading despite repeated instructions from teachers⁵. It is also even more difficult to recognise those at risk as dyslexia does not affect intelligence levels, despite having difficulty reading⁹. Thus, early detection is critical, especially for pupils with literacy difficulties.

In Malaysia, Dyslexia diagnosis is often a time-consuming process. This situation is similar to other countries like Brazil, where according to Germano⁷, the official diagnosis of dyslexic pupils can take a long time. The diagnosis of dyslexia in Malaysia only occurs at the primary school level using the Dyslexia Checklist Instrument¹⁵. Pupils with dyslexic characteristics during the screening will be referred to a medical practitioner in a hospital to obtain an official diagnosis of dyslexia. Only those with an official diagnosis are eligible to attend special education classes for dyslexic pupils, while many well-to-do parents enrol their children in self-funded, private dyslexia intervention programmes.

A study by Carmen⁹ mentioned that early identification of children at risk of dyslexia should be done as early as at the preschool level. This is supported by evidence from other studies indicating that early interventions in preschool could increase the effectiveness of intervention programmes⁹. In this regard, Identifying pupils at risk of dyslexia at the preschool level could help professionals such as physicians and clinical psychologists diagnose dyslexia. According Tymm¹⁰ explained that identification needs to start in preschool to provide pupils with the necessary intervention. Kathryn¹¹ stated that early identification at the preschool level could benefit other professionals such as teachers, conversational therapy individuals, medical practitioners and clinical psychologists to plan pupils' needs, especially the appropriateness of the intervention. Another study by Singh¹² asserted that early identification of pupils at risk of dyslexia facilitates the collaboration between counselors, paediatricians, clinical psychologists, psychiatrists and special education teachers in providing early intervention in academic and social contexts. These arguments highlighted the benefits of early identification to prevent delays that could lead to long-term implications and more adverse effects of dyslexia.

Early identification of at-risk pupils at the preschool level can prevent more serious implications of dyslexia, which could affect pupils' academic performance in primary school. A delay in identifying dyslexic characteristics could affect pupils academic achievement. Pupils with a late diagnosis of dyslexia often experience low academic achievement and lack of motivation in learning, eventually leading to low self-confidence⁶. Therefore, this study aims to determine the prevalence of pupils at risk of dyslexia in preschool in the Hulu Langat district, Selangor.

Table 2: Prevalence of Pupils Risk of Dyslexia in Preschool, Hulu Langat District, Selangor

Category	Male	Female	Total
At-risk of dyslexia	7 (12%)	2 (3%)	9 (7%)
Not at risk of dyslexia	51 (88%)	67 (97%)	118 (93%)

Table 3: Categorization of pupils at at Different Dyslexia Risk Levels (n = 9)

Category	Male	Female	Total
Very highly at-risk	4 (45%)	1 (11%)	5 (56%)
Highly at-risk	2 (22%)	1 (11%)	3 (33%)
At-risk	1 (11%)	-	1 (11%)
	7 (78%)	2 (22%)	9 (100%)

METHODOLOGY

This cross-sectional study was conducted among six-year-old preschoolers attending preschool in the Hulu Langat district, Selangor, Malaysia. The total population of six-year-old preschoolers is 1889. According to the OpenEpi software formula, a total of 127 students were selected as the sample size for this study¹³. The respondents were chosen using the systematic random sampling method. Trained facilitators administered tests to preschoolers who met three specific criteria which they had to be six years old within the current year, Malaysian citizenship, and obtaining consent from their parents or guardians to participate in the study.

To determine the prevalence at risk of dyslexia based on their writing, reading, and speaking abilities, the Dyslexia Screening Test-Junior Instrument¹⁴ was utilized. This instrument is specifically designed for assessing dyslexic students according to their age. The screening process involved evaluating the preschooler in twelve constructs, including rapid naming, bead threading, one-minute reading, phonemic segmentation, two-minute spelling, backward digit span, nonsense passage reading, one-minute writing, verbal fluency, rhyme, vocabulary, and postural stability.

The respondents were classified into different categories based on their test scores. There were five score categories established: "very highly at risk" (scores ranging from 1 to 4), "highly at risk" (scores ranging from 5 to 11), "at risk" (scores ranging from 12 to 22), "normal performance" (scores ranging from 23 to 77), and "exceeding normal performance" (scores ranging from 78 to 100). The instrument used in this study underwent validation, with permission obtained from the authors. Additionally, the instrument was translated into Malay language and adapted to align with the Malaysia National Preschool Standard Curriculum, as the original instrument was designed for a foreign preschool curriculum (United Kingdom). The adaptation process in Malaysia took into consideration sentence and syllable usage, as well as the selection of appropriate pictures. Content validation was conducted by engaging seven experts from diverse fields to ensure the suitability and applicability of this instrument for preschool students in Malaysia. The researcher also assessed the face and content validity of the instrument to evaluate the respondents' understanding of its structure. Furthermore, the instrument demonstrated good reliability, as indicated by a Cronbach's Alpha coefficient of 0.84.

RESULTS

Table 1 provides an overview of the demographic characteristics of the respondents in this study. Gender distribution shows that 46% (58) of the respondents are male, while 54 (69%) are female. In terms of race, the majority 98% (125) are Malay, with a small representation of Indian 1% (1) and other 1% (1) races. Father's occupation reveals that 22% (28) are self-employed, 25% (32) are government employees, 52% (66) work in the private sector, and 1% (1) are unemployed. Similarly, mother's occupation distribution shows 11%(14) self-employed, 13%(16) government employees, 25% (32) in the private sector, and 51% (65) unemployed. Regarding the history of dyslexia, 4% (5) of

respondents have a family history of dyslexia, while the majority 96% (122) have no history of dyslexia in their families. These demographic insights provide a comprehensive of the respondents and their backgrounds, laying the groundwork for further analysis and interpretation.

Table 2 provides insight into the prevalence of preschoolers at risk of dyslexia within the preschool population of the Hulu Langat district in Selangor. The "At-risk of dyslexia" category encompasses 7 (12%) of males and 2 (3%) of females, contributing to an overall prevalence of 9 (7%) among the entire sample. In contrast, the "Not at risk of dyslexia" category comprises 51 (88%) of males and 67 (97%) of females, accounting for 118 (93%) of the total sample.

Table 3 categorizes pupils at risk of dyslexia in three different risk levels. Among those at the "Very highly at-risk" level, 4 (45%) are male and 1 (11%) are female, totaling 5 (56%). In the "Highly at-risk" category, 2 (22%) are male and 1 (11%) are female, amounting to 3 (33%). For the "At-risk" group, 1 (11%) are male, contributing to an overall 1 (11%) prevalence. Combining all risk levels, 7 (78%) of at-risk pupils are male, while 2 (22%) are female, making up 100% of the total at-risk population. This table simplifies the distribution of dyslexia risk levels among pupils and addresses the study's aim to identify different risk levels within the preschoolers of Hulu Langat District.

DISCUSSION

The findings from this study underscore a notable prevalence of dyslexia risk among preschoolers, encompassing both boys and girls. Among the pupils categorized as being at risk of dyslexia, a significant majority fall into the "very highly at-risk" category, followed by those classified as "highly at-risk" and "at-risk." This observation underscores the critical importance of early detection in assessing the extent of dyslexia risk prevalence among preschoolers.

Early detection assumes particular significance for children with dyslexia, as it opens doors to equitable educational opportunities comparable to their typically developing peers. Furthermore, such early identification empowers educators to proactively evaluate and design timely interventions tailored to the needs of at-risk children, thereby fostering improvements in their academic accomplishments.

By identifying at-risk pupils at the preschool level, a collaborative effort involving educators, speech therapists, medical practitioners, and clinical psychologists can formulate targeted intervention strategies¹¹⁾. According to Hulme⁶⁾ highlights that delayed diagnosis of dyslexia often correlates with diminished academic performance and waning learning motivation, ultimately eroding self-confidence.

Beyond the instrumental aspects of identification, the results offer valuable insights for formulating timely and effective interventions. Early intervention aligns with the rapid pace of a child's brain development during these formative years. This proactive approach bolsters cognitive and neural growth, thereby readying pupils for successful learning journeys.

This study strongly advocates for early identification of dyslexia risk among preschoolers using tailored assessment tools. These proactive endeavors hold the potential to preempt future learning challenges and pave the way for seamless academic progression. Moreover, integrating such assessment tools into practice can yield substantial benefits for students, teachers, and parents alike, cultivating a conducive environment for sustaining academic excellence.

Additionally, this approach to identification can mitigate delays in recognizing dyslexic pupils, potentially curbing early school dropouts and ensuring a smoother transition to primary education. Consequently, the implementation of these instruments carries substantial transformative potential, fostering a culture of academic achievement while mitigating educational disparities.

CONCLUSION

The prevalence data presented in this study serves as a robust foundation for establishing precise and pertinent assessment tools. These tools play a pivotal role in effectively identifying preschool pupils at risk of dyslexia. In essence, this study highlights the critical interplay between accurate prevalence data, informed identification methods, and timely interventions. By leveraging these insights, we not only enhance the educational experience of individual pupils but also contribute to the

overall effectiveness and inclusivity of our education system. Through proactive measures, we pave the way for a brighter future for all learners, regardless of their learning challenges. In conclusion, the prevalence data in this study can be used as a solid basis for determining accurate and relevant instruments to enable the implementation of identification to identify pupils at risk of dyslexia at the preschool level. Early detection and intervention are highly impactful for students, teachers, and other professionals.

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INFORMED CONSENT

Written informed consent was obtained from each participant parent's, and they were assured of their right to withdraw from the study at any point without consequences.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest related to this work.

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