

PRESCHOOL TEACHERS' KNOWLEDGE ON EARLY DETECTION OF DYSLEXIA FOR PRESCHOOL STUDENTS: A SYSTEMATIC LITERATURE REVIEW 2015-2020

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ABSTRACT

Preschool teachers' knowledge on early detection of dyslexia for students in preschool is essential to ensure students' success into adulthood. Therefore, this study conducts a methodology based on a Systematic Literature Review (SLR) to determine preschool teachers' knowledge on the early detection of dyslexia for students in preschool. This study showed an investigation from October to December 2020 in three academic search systems, namely Scopus, Google Scholar and Mycite. The search yielded 29 articles and has identified 6 articles in the screening and evaluation process. Search terms are knowledge, preschool teachers, early detection, dyslexia and preschool students. This study shows that preschool teachers' knowledge of the early detection of dyslexia for preschool students is still at an unsatisfactory level. Furthermore, this study is also still poorly implemented either locally or abroad. Worryingly, the study also found that there are still no early detection instruments of dyslexia for preschool students in Malaysia. No early detection causes many students to be late in obtaining interventions. The implications of this study indicate that there is a need to establish an instrument for the early detection of dyslexia for preschool students in Malaysia.

Keywords: Knowledge, Preschool, Early Detection, Dyslexia, SLR

1.0 Introduction

According to the International Dyslexia Association, IDA (2017), ¹almost 15% to 20% of the population are affected by several dyslexia symptoms including impairment in reading and writing. Thus, Dyslexia is a term used in the field of special education especially in the category of specific learning disability (SLD). In order that, Malaysian therapists, researchers and dyslexia organizations are still being pursued in depth of knowledge and understanding of dyslexia. On the other side, dyslexia becomes the focus and study material in abroad compared to Malaysia. Based on The Salamanca Statement and Framework For An Action

¹ International Dyslexia Association. (2017). *Dyslexia In The Classroom: What Every Teacher Needs To Know*. Retrieved from <https://dyslexiaida.org/dyslexia-in-the-classroom/>

on Special Needs Education (1994)² has been practiced in nationwide by ensuring that every child whether with learning disabilities, disabilities remains given equal education at an early stage. With this, the aspect of early detection plays an important role in identifying students with specific learning disabilities such as dyslexia since preschool age. Thus, the role of preschool teachers in early detection of children becomes a major dominant for addressing preschool children classified as dyslexic pupils.

1.1 Objective

Identify issues and status of early detection dyslexia among preschool children based on the level of knowledge of preschool teachers.

1.2 Problem Statement

Figure 1.4 Number of Dyslexia by School and Special Education Program

BIL	JENIS KURANG UPAYA	SPK			PPKI			PPI AP			JUMLAH KESELURUHAN
		PRA	REN	MEN	PRA	REN	MEN	PRA	REN	MEN	
1	ADHD	5	36	27	56	3,440	1,682	4	330	227	5,807
2	Autisme	36	93	23	444	7,726	2,477	27	483	237	11,546
3	Kurang Upaya Intelektual	3	96	232	35	9,563	8,027	2	1,097	903	19,958
4	Lembam	1	24	224	17	5,062	6,957	1	562	675	13,523
5	Sindrom Down	7	34		142	2,339	1,300	9	37	1	3,000
6	Diseksi	4	33	142	10	3,341	3,034	3	1,743	1,233	12,413
7	Lain - Lain	3	29	20	131	2,008	940	59	302	177	3,669
JUMLAH		59	347	668	841	36,290	25,685	107	4,554	3,459	72,010
		1,074			62,816			8,120			

(Source: Special Education Data, 2019³)

Based on the number of dyslexic children by school, it has been proven that the number of dyslexics at the primary and secondary school level is high compared to the preschool level.

² The Salamanca Statement and Framework For Action On Special Needs Education. (1994, 7-10 Jun). *World Conference on Special Needs Education : Access and Quality*. Retrieved from <https://www.european-agency.org/sites/default/files/salamanca-statement-and-framework.pdf>

³ Special Education Data. (2019). Retrieved from <https://www.moe.gov.my/en/muat-turun/pendidikan-khas/buku-data-pendidikan-khas/3156-buku-data-pendidikan-khas-tahun-2019/file>

So, this issue has prompted researchers to look for the factors that contribute to the increase in dyslexia at the primary and secondary levels. Thus, previous studies on aspects of early detection of Dyslexia at the Preschool level have provided knowledge to researchers about the scope of this issue. For example, Germano et al. (2017)⁴ in their study 'Screening Protocol for Early Identification of Brazilian Children at Risk for Dyslexia' was conducted for two main purposes namely to develop a screening tool protocol for identifying early detection of Brazilian children at risk for dyslexia. The second purpose is to identify protocol prediction variables in using 'Principal Component Analysis'. Thus, based on the reading of previous studies, proving the aspect of early detection is very important for a child especially since preschool so that language skills and academic achievement could be optimized. In short, based on previous studies on the early detection of dyslexia that carry out in abroad, it was found that they are concern on early awareness of dyslexia compared to Asian countries including Malaysia. The implication is that the awareness and reluctance of teachers towards dyslexics has not been addressed since preschool, resulting in the number of dyslexics at primary and secondary levels compared to preschool.

2.0 Body Of Paper

2.1 Introduction

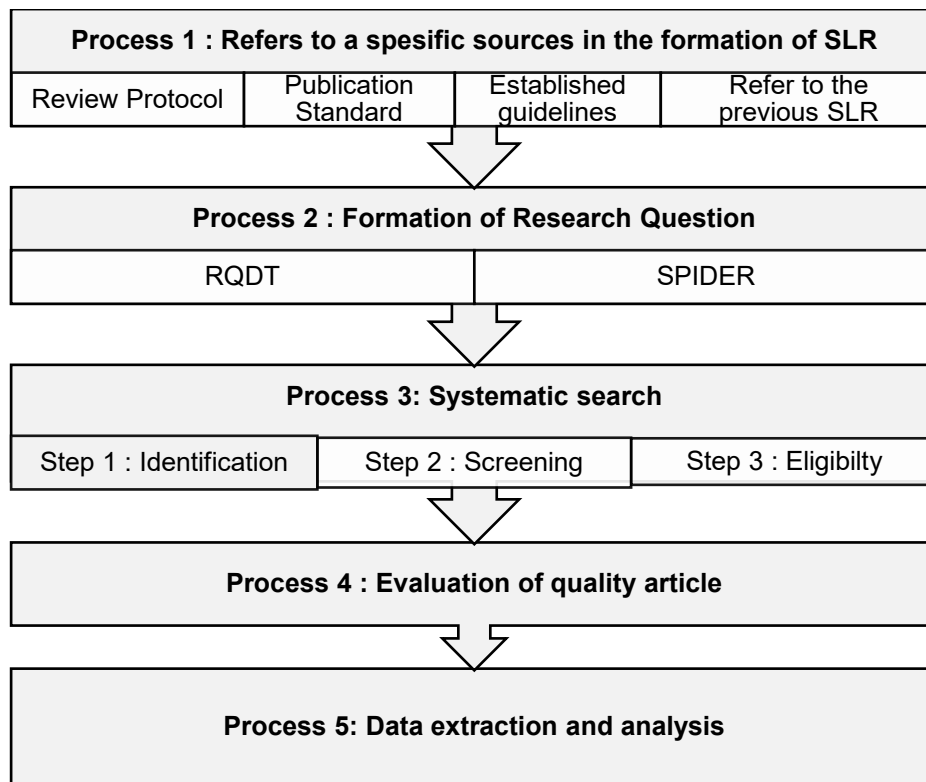
The approach used to conduct this study is Systematic Literature Review (SLR). Basically, SLR methodology refers to five main processes according to Hayrol Azril (2020)⁵. Basically, the first process is to refer to specific sources in the formation of SLR, the second process is the formation of research questions, then systematic search, the fourth process is article quality evaluation and finally extraction and analysis data.

⁴ Germano, G.D., Cesar, A.B., & Capellini, S.A. (2017). Screening Protocol For Early Identification of Brazilian Children At Risk For Dyslexia. *Educational Psychology*. <https://doi.org/10.3389/fpsyg.2017.01763>

⁵ Hayrol Azril. (2020). Metodologi asas Systematic Literature Review.

2.2 Methods

Figure 2.2 shows flow chart of SLR Process



Firstly, researchers refer to specific sources in the formation of SLR. For an example, review protocols, publication standards, established guidelines and refer to previous SLR that have been published. In detail, PRISMA is one of the review protocols used in the field of educational management (McKenzie JE et al, 2020)⁶. With this, PRISMA enable researchers to provide accurate information based on research question. Based on the review protocol, the researchers initiated the SLR with the formation of the study questions. Thus, this process called as second process that uses the Research Questions Development Tool (RQDT) in formulating research questions. Based on RQDT namely SPIDER; (Sample, Phenomenon of Interest, Design, Evaluation, Research Type) framework used to create research question.

Third process in SLR is systematic search. There are three dominant steps involved. First step is known as identification. In this process, efforts to diversify or multiply keywords are made. Thus, the synonym method was applied when searching for data. For example, researchers perform an identification process by looking for the synonyms by using websites, keywords that been previously used in past studies, and also keywords suggested in databases such as SCOPUS, Web of Science and collaborating among experts. Based on study of Kraus et al. (2020) ⁷emphasize the

⁶ McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD. (2020). *The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71.* doi: 10.1136/bmj.n71

⁷ Kraus, S., Breier, M., & Dasi-Rodriguez, S. (2020). The art of crafting a systematic literature review in entrepreneurship research. *International Entrepreneurship and Management Journal*, <https://doi.org/10.1007/s11365-020-00635-4>

importance of the concept of 'exhaustive and precision' in the identification process. This means that although the keywords can be varied however, the researcher must ensure that the keywords are accurate and appropriate to the scope of the study. In short, the relevance and accuracy of keywords in finding data is very important. Next is the second step, which is the screening process. Screening is a process of selecting articles that are appropriate and relevant to SLRs based on set criteria. Thus, the researchers considered three criteria: the year of publication (2015 to date), the types of documents such as journal articles by Johnson and Hennessy (2019)⁸, the type of language (Linares-Espinós et al, 2018)⁹ in which only the Malay language and English are used to facilitate the researcher's understanding. The third step is known as eligibility. The third step in this systematic search is considered the second screening process. In this process, the researcher will examine all the selected articles from the first screening process to ensure that all the selected articles meet the set criteria and are relevant to the study. Upon completion of the systematic search process, not all selected articles can continue to be reviewed; their quality should be evaluated based on two methods. The first method is the quantitative method of 'Cohen Kappa Analysis' where the value should be more than 0.40. On the other hand, experts to determine the level of quality of an article also use qualitative methods. The final process in SLRs is data extraction and analysis. The process of extracting data or retrieving relevant data from previous studies should be based on the research question to be studied.

⁸ Johnson, B.T., & Hennessy, E.A. (2019) Systematic reviews and meta-analyses in the health sciences: Best practice methods for research syntheses. *Social Science and Medicine*, 233, 237-251

⁹ Linares-Espinós, E., Hernández, V., Domínguez-Escrig, J.L., Fernández-Pello, S., Hevia, V., Mayor, J., Padilla-Fernández, B., & Ribal, M.J. (2018). Methodology of systematic review, *Actasurologicas españolas*, 42(8), 499-506.

2.3 Results

The following is the latest PRISMA flow chart by McKenzie JE et al (2020) and adapted according to the SLR of this study.

Figure 2.3. Adapted PRISMA flow chart

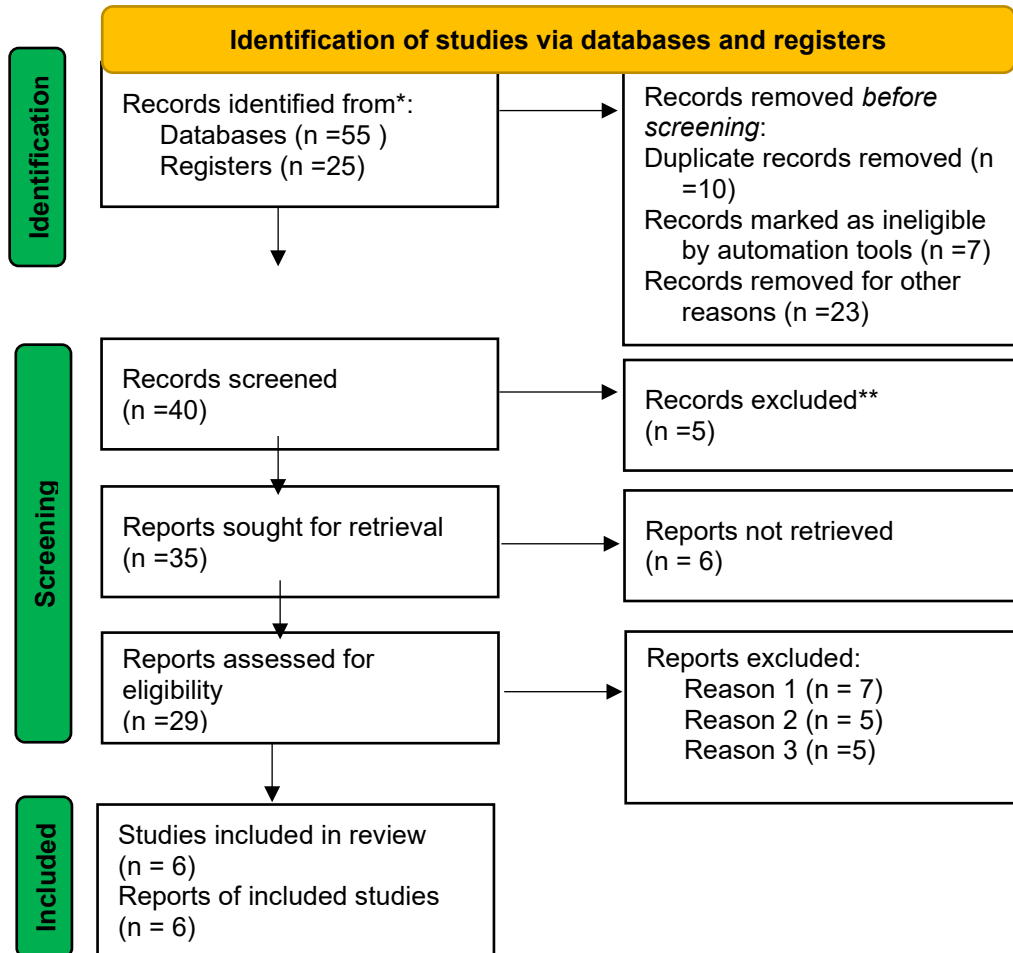


Table 2.4 shows Analysis of Systematic Literature Review

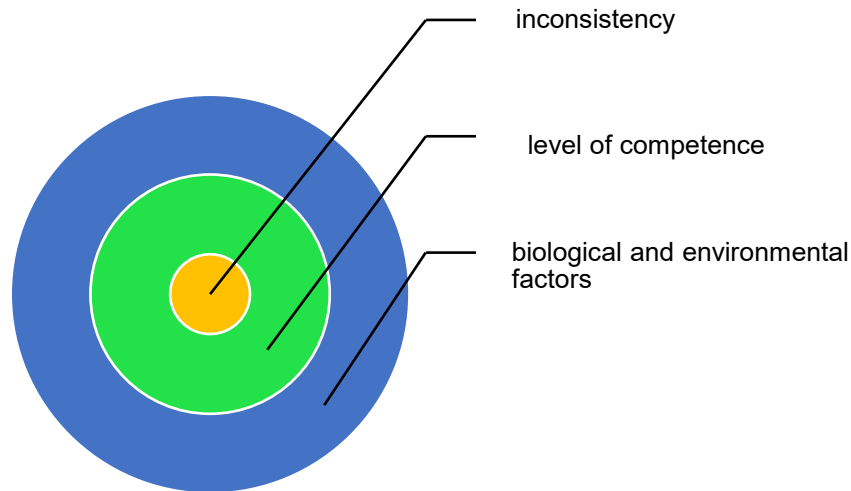
No	Author & Year	Research Objective	Samples	Methods	Issues and Status of Early Detection of Dyslexia in terms of knowledge of Preschool teachers	SUB- THEME
1.	Shu Sze et al (2018)	Determining the relationship between phonological awareness skills and visual-spatial abilities global among Malay children with SLD and compares them with typical children	Experimental group -18 SLD children (7-12 years) Control group-18 typical children (7-12 years)	4 Types of Tests -Dyslexia Screening Test Bahasa Malaysia (DSTBM) -Wechsler Intelligence Test for Children (WISC-IV). - The Vineland Adaptive Behavior Scale Second edition (VABS-II) -The Child Behavior Checklist 4-18 (CBCL)	<ul style="list-style-type: none"> Malay children with SLD have difficulties in phonological awareness skills and visual-spatial abilities compare to typical students. Lack of appropriate assessment tools to measure global spatial visual capabilities 	<ul style="list-style-type: none"> phonological awareness skills visual-spatial abilities assessment tools
2	Anis et al. (2018)	to study various methods or treatments used to manage literacy and cognitive abilities for children with dyslexia, especially in Malaysia	NONE	-SLR Online databases such as PubMed, Ebscohost and Medline over a six - year period from 2000 to 2016. An initial total of 300 articles were produced but only 13 articles met the criteria	<ul style="list-style-type: none"> There is no standard module for Dyslexia classes in Government schools Prioritize reading and writing skills over cognitive skills Application of traditional teaching and learning techniques to all categories of children 	<ul style="list-style-type: none"> Special modules Ancillary skills Traditional Teaching Techniques
3	Clerk et al (2019)	adapt and develop a dyslexia screening tool in the mother tongue for children in isiXhosa.	15 children from Grades 1-4, 13 teachers and parents for children	-The Bellavista Dyslexia Screening Tool (BVDST) -Checklist for Teachers (adapted from Kelly & Philips, 2016) -Interviews for parents	<ul style="list-style-type: none"> Early detection can increase self - confidence, failure in school and can prevent low incomes in the future. The low level of Teachers' expertise in identify children's risk I in terms of speaking, spelling, reading and writing through observation 	<ul style="list-style-type: none"> Values and Attitudes Screening tool Materials Teacher expertise Observation

No	Author & Year	Research Objective	Samples	Methods	Issues and Status of Early Detection of Dyslexia in terms of knowledge of Preschool teachers	SUB- THEME
4	Germano et al. (2017)	developing a screening tool protocol to identify the early detection of Brazilian children at risk for dyslexia Identify protocol prediction variables in using 'Principal Component Analysis'	149 six-year-old children of both sexes enrolled in the Primary School Year One class	The Screening Protocol for Early Identification of Reading Problems contains seven cognitive-linguistic test items (for 50 minutes)	<ul style="list-style-type: none"> The level of academic competence of teachers in early detection has also played a role on phonics and literacy awareness for children. Teachers need to have knowledge and take action on children who experience language delays at an early stage before Year one by conducting initial screening. 	<ul style="list-style-type: none"> Competence Early detection Awareness General knowledge Preliminary action
5	Ramli et al. (2019)	identify the level of knowledge of teachers about dyslexia which includes general knowledge, diagnosis, symptoms and treatment.	138 KEMAS preschool teachers in Hulu Langat district, Selangor.	'Knowledge and Beliefs about Developmental Dyslexia' questionnaire based on three likert scales.	<ul style="list-style-type: none"> The level of general knowledge of teachers about dyslexia is at an optimal level The level of detailed knowledge in terms of symptoms, diagnosis, prevention and early treatment is still at a very minimal rate. Teachers fail to detect the characteristics of dyslexic children resulting in the teaching methods used do not affect the children Although teachers have the level of education up to a master's degree in teaching and a long period of service, but preschool teachers still lack the knowledge and skills to detect dyslexia for preschool children. Teachers 'negative attitudes towards dyslexic children such as labeling' lazy 'and' sluggish 'due to limited knowledge 	<ul style="list-style-type: none"> Knowledge Symptoms Diagnosis Prevention Early treatment Features Teaching methods Level of teacher education Period of service Skills Attitude Likes to label

No	Author & Year	Research Objective	Samples	Methods	Issues and Status of Early Detection of Dyslexia in terms of knowledge of Preschool teachers	SUB- THEME
6	Gonzalez & Brown (2019)	Exploring perceptions of dyslexia and investigating how early childhood teachers at Head Start understand the perception of dyslexia risk and how to identify solutions	Two teachers in each school (n = 4) and a total of 19 preschool children.	semi -structured interviews observations, teacher assessment scales and the Preschool Early Literacy Indicator (PELI) instrument.	<p>Having the skills to identify the characteristics of dyslexia when found that children have difficulty in learning 'rhymes', children are unable to recognize letters for their own names, utter more to baby sounds and fail to remember letter names.</p> <p>Teachers used the studied early detection instrument (PELI) for preschool children in a New Jersey, USA school.</p> <p>There are a handful of teachers who say the issue of letter reversal is one of the main factors that can be identified in the early detection of dyslexia.</p> <p>Some teachers say that spelling and coding problems during reading are also identifiable factors in early detection.</p> <p>Preschool teachers' perceptions of dyslexia are categorized as a disorder in visual processing while some say dyslexia as a disorder in phonological processing.</p> <p>Teachers also argue that dyslexia stems from genetic, environmental and neurobiological factors.</p>	<ul style="list-style-type: none"> ➤ Skills ➤ Difficulties in 'rhymes ➤ Recognize and recite letters ➤ Detection instruments ➤ Letter reversal issues ➤ Spelling and coding issues ➤ Disturbances in visual processing ➤ Phonological Processing Disorders ➤ Genetic issues ➤ Environment ➤ Neurobiological

2.4 Discussion

Figure 2.4 shows main theme of issues



There are several issues of early detection of dyslexia from the perspective of preschool teachers in terms of knowledge were highlight. Firstly, preschool teachers experiencing the issue of inconsistency in detecting dyslexic children. For an instance, sub themes that support this main theme were special modules, screening tools, materials, awareness, initial action and exposure. In order that, when there is no specific modules and uniform screening tools its disable the preschool teachers to carry out early action towards the children. Based on the findings of the study of Anis et al (2018)¹⁰, it is clear that there is no standard module for Dyslexia classes in Government schools and it prioritizes reading and writing skills over cognitive skills. The impact is huge and has a negative influence on the development of preschool children in terms of literacy and numeracy as well as self-development.

Next, the second issue is the minimum level of competence on the early detection of dyslexia for preschool children. There are several sub -themes that show the issue are traditional teaching techniques, teacher expertise, observation, knowledge, symptoms, diagnosis, teaching methods, teacher education level, length of service, like labeling, causes of treatment, misconceptions. For example, the issue of minimum level of competence can be divided into three aspects in terms of knowledge, skills and attitudes. In terms of knowledge, preschool teachers have knowledge of the general characteristics and symptoms of dyslexia as a whole are high. In fact, the level of knowledge in how to diagnose, treat and prevent dyslexia is still limited and unsatisfactory. There are several results of previous studies supporting this issue including the results of a study by Ramli et al. (2019) commented that the level of knowledge in detail in terms of symptoms, diagnosis, prevention and early treatment for preschool children is still at a very minimal rate. Based on Clerk, Naidoo and Lilenstein

¹⁰ Anis, M.Y.N., Normah, C.D., Mahadir,A., Norhayati., Rogayah,A.R., & Dzalani, H. (2018). Interventions For Children With Dyslexia: A Review On Current Intervention Methods. *Med J. Malaysia*, 73 (5), 311-320.

(2019)¹¹, where teachers have the expertise to identify the level of risk of children in terms of speaking, spelling, reading and writing through observation. Whereas, according to Germano et al (2017), the level of academic competence of teachers in early detection as well has played a role on phonics and literacy for children. In fact, teachers need to have knowledge and take action on children who experience delays in language at an early stage even before Year one by conducting early screening.

On the other hand, in terms of skills, preschool teachers who are busy using traditional teaching methods proved that they are less skilled in identifying dyslexia with a variety of learning methods. This situation is further evidenced by the findings of a study by Ramli et al. (2019)¹², in which teachers failed to detect the characteristics of dyslexic children resulting in the teaching methods used not affecting the children. In addition, Germano et al (2017) found that the application of traditional teaching and learning techniques to all categories of children resulted in failure in detecting dyslexia. From the aspect of attitude, preschool teachers have an attitude of labelling dyslexic children with the words 'sluggish' and 'stupid' when there is no exposure and awareness about dyslexia. In short, a teacher's level of education and length of service do not determine a teacher's credibility in early detection of dyslexia even if his or her level of education is high such as diploma, degree and length of service of more than three years. Thus, issues of the level of knowledge, skills and attitudes of preschool teachers have a dominant impact on the achievement of preschool children in terms of academic and non-academic.

The third issue seen based on the teacher's perspective is in terms of biological and environmental factors. The sub -themes that support this argument are disorders in visual processing, phonological processing disorders, genetic, environmental and neurobiological issues. Based on the results of a study Gonzalez and Brown (2019)¹³found, teachers also argue that dyslexia caused from genetic, environmental and neurobiological factors. In contrast, preschool teachers, the level of knowledge about disorders in visual and phonological processing is very limited. In Gonzalez and Brown's (2019) study, they commented on preschool teachers' perceptions of dyslexia, which they categorized as a disorder in visual processing whereas some said dyslexia as a disorder in phonological processing. In short, preschool teachers say the issue of biological factors involving elements of mental and physical health as well as intelligence has resulted in failing to detect dyslexia since preschool children. When teachers approach these at-risk children, they cite environmental factors at home as well as at school.

¹¹ Clark, A., Naidoo, K., & Lilenstein, A. (2019). Adapting A Screening Tool For Dyslexia in IsiXhosa. *Journal of the Reading Association of South Africa*, 10(1), 1-10.
<https://doi.org/10.4102/rw.v10i1.235>

¹² Ramli, S., Idris, I. B., Omar, K., Harun, D., Surat, S., Yusop, Y.M. & Zainudin, Z.N. (2019). Preschool Teachers' Knowledge on Dyslexia: A Malaysian Experience. *Malaysian Journal of Medicine and Health Sciences*, 134-139.

¹³ Gonzalez, M., & Brown, T.B.H. (2019). Early Childhood Educator's Perceptions of Dyslexia and Ability To Identify Students At-Risk. *Journal of Education and Learning* 8(3), 1-12.
<https://doi.org/10.5539/jel.v8n3p1>

3.0 Conclusion

The younger generation needs to be polished and curbed with learning disabilities such as dyslexia since preschool so that it does not become an obstacle to the development and sustainability of Malaysia. In short, all parties whether preschool teachers, parents or government and non-government agencies should work together to emphasize the early detection of dyslexia before children enter the school world.

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References

- Anis, M.Y.N., Normah, C.D., Mahadir,A., Norhayati., Rogayah,A.R., & Dzalani, H. (2018). Interventions For Children With Dyslexia: A Review On Current Intervention Methods. *Med J. Malaysia*, 73 (5), 311-320.
- Clark, A., Naidoo, K., & Lilenstein, A. (2019). Adapting A Screening Tool For Dyslexia in IsiXhosa. *Journal of the Reading Association of South Africa*, 10(1), 1-10. <https://doi.org/10.4102/rw.v10i1.235>
- Germano, G.D., Cesar, A.B., & Capellini, S.A. (2017). Screening Protocol For Early Identification of Brazalian Children At Risk For Dyslexia. *Educational Psychology*. <https://doi.org/10.3389/fpsyg.2017.01763>
- Gonzalez, M., & Brown, T.B.H. (2019). Early Childhood Educator's Perceptions of Dyslexia and Ability To Identify Students At-Risk. *Journal of Education and Learning* 8(3), 1-12. <https://doi.org/10.5539/jel.v8n3p1>
- Hayrol Azril. (2020). Metodologi asas Systematic Literature Review.
- International Dyslexia Association. (2017). *Dyslexia In The Classroom: What Every Teacher Needs To Know*. Retrieved from <https://dyslexiaida.org/dyslexia-in-the-classroom/>
- Johnson, B.T., & Hennessy, E.A. (2019) Systematic reviews and meta-analyses in the health sciences:Best practice methods for research syntheses. *Social Science and Medicine*, 233, 237-251
- Kraus, S., Breier, M., & Dasi-Rodriguez, S. (2020). The art of crafting a systematic literature review in entrepreneurship research. *International Entrepreneurship and Management Journal*, <https://doi.org/10.1007/s11365-020-00635-4>
- Linares-Espinós, E., Hernández, V., Domínguez-Escrig, J.L.,Fernández-Pello, S., Hevia, V., Mayor, J., Padilla-Fernández, B.,&51 Ribal, M.J. (2018). Methodology of systematic review, *Actasurologicas espanolas*, 42(8), 499-506.
- McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD. (2020). *The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ* 2021;372:n71. doi: 10.1136/bmj.n71
- Ramli, S., Idris, I. B., Omar,K., Harun, D., Surat, S., Yusop,Y.M. & Zainudin, Z.N. (2019). Preschool Teachers' Knowledge on Dyslexia: A Malaysian Experience. *Malaysian Journal of Medicine and Health Sciences*, 134-139.
- Shu Sze, A.C., Din, N.C., Ahmad, M., Ibrahim, N., Abdul Razak, R., & Shuen, P.K. (2018). Phonological Awareness and Global Visual Spatial Ability Among Malay Speaking Children With Specific Learning Disorder with Dyslexia. *Malaysian Journal of Public Health Medicine*, (1), 115-124.
- Special Education Data. (2019). Retrieved from <https://www.moe.gov.my/en/muat-turun/pendidikankhas/buku-data-pendidikan-khas/3156-buku-data-pendidikan-khas-tahun-2019/file>

The Salamanca Statement and Framework For Action On Special Needs Education. (1994, 7-10 Jun). *World Conference on Special Needs Education : Access and Quality*. Retrieved from <https://www.european-agency.org/sites/default/files/salamanca-statement-and-framework.pdf>