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Review Paper

A Market Research Review on Specific Learning Disorder Assessments Available Offline and Online in India

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ABSTRACT

Specific Learning Disability (SLD) is a type of Neurodevelopmental Disorder that impedes the ability to learn or use specific academic skills which are the foundation for other academic learning. It is characterized by the impairment in phonological processing in dyslexics as it compromises the development of stable phonology representations. The prevalence of SLD in India is increasing year by year due to the increase in the number of dyslexic children in India. In India, the access, affordability, and knowledge of the SLD, their assessments as well as the intervention methods are still not known for most of the parent population. There are a lot of web-based and mobile-based assessments that are available for intervention for dyslexia. The aim of this market research is to provide an overview of the available assessment tools for SLD and to provide a reference for parents.

Keywords: *SLD, Dyslexia, Dyscalculia, Dysgraphia, Aphasia, Phonology*

Specific Learning Disability (SLD) according to DSM-5 is a type of Neurodevelopmental Disorder that impedes the ability to learn or use specific academic skills which are the foundation for other academic learning. The learning difficulties are unexpected in that other development aspects seem fine. The diagnosis of this difficulty can be done only after years of formal education, but the signs will also be visible during preschool years. Three domains have to be assessed to ensure that the child falls under dyslexia which are: Reading, Writing and Mathematics abilities (International Dyslexia Association, 2015). A specific learning disability is defined by the Individuals with Disabilities Education Act (IDEA) as a disorder in one or more of the basic psychological processes involved in understanding or using language, whether spoken or written, that manifests itself in the inability to listen, think, speak, read, write, spell, or perform mathematical calculations. Perceptual impairments, brain damage, mild brain dysfunction, dyslexia, and developing aphasia are all included in this category (Shaywitz et al., 2020). SLD is divided into three aspects as mentioned for assessment. Reading and Language disabilities are defined as Dyslexia, if the child is unable to express through writing into a paper with problems in spelling, grammar, punctuation and handwriting then it is categorized into dysgraphia.

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Another definition comes from, **"The Children with Specific Learning Disabilities (Identification and Support in Education) Bill (2018)"** in India, specific learning disability means a disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell or do mathematical calculations and includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, dyspraxia, dyscalculia, dysgraphia and development aphasia, but does not include a learning problem that is primarily the result of visual, hearing or motor disabilities, of mental retardation, of emotional disturbance, or environmental, cultural or economic disadvantages. Also, it defines dyslexia as a learning disability that affects a person's ability to acquire, process and use either spoken, written or nonverbal information including organization and planning, functional literacy skills, memory, reasoning, problem-solving and perceptual skills or in other words, difficulty with language in its various uses including reading. Dyscalculia is defined as a learning disability characterized by difficulty in mathematics. Dysgraphia is a learning disability characterized by difficulty with the act of writing both in the technical as well as the expressive sense including difficulty with spelling. The DSM-5 (American Psychiatric Association, 2013) and IDEA (2004) define Specific Learning Disorder (SLD) which is characterized by difficulties in reading (dyslexia), writing (dysgraphia), and arithmetic (dyscalculia). This paper focuses on the prevalence of SLD in India, challenges of diagnosis and the availability of assessment tools.

Neurological and Behavioral Evidence

Getting deep inside the factors and reasons about how SLD are caused, the term unexpected refers to the cases where the individual has problems learning, reading, and understanding the words even with sufficient and proper instructions. Considering the behavioral aspects of a dyslexic, they will find it difficult and make errors while doing phonological processing such as rhyming, syllable counting, and sounding out pseudo words. Some researchers have also found that dyslexics have a deficit in processing rapidly changing auditory information. According to the rapid processing hypothesis, there has been evidence that deficits in rapid auditory processing impair the ability to discriminate auditory cues necessary to distinguish phonemes. This leads to difficulties in phonological processing in dyslexics as the impairment compromises the development of stable phonological representations.

Getting into the studies that show differences in the activity of brain regions, some of the studies that brought insights about dyslexia are as follows:

During phonological processing, a decreased activity (relative to control) in the left temporoparietal cortex is found (Galaburda et al., 1985). Galaburda and colleagues (Galaburda et al., 1985) found an asymmetry in the planum temporale area of the brain. This was previously found in another study by Altarelli and colleagues (Altarelli et al., 2014) in 2014 where there is a difference between girls and boys with dyslexia.

Another study by Martin and colleagues in 2016 found that the left occipito-temporal cortex which includes the visual word form area reported under activation. This visual word form area is critical in reading. This meta-analysis study found that 57% of studies done on shallow orthographies and 64% of deep orthographies have found this difference in activation. Another area after occipito-temporal cortex is the Inferior Parietal lobule which showed low activation.

Around the globe, SLD is addressed with serious concern. According to the American Psychiatric Association, the prevalence of dyslexia is around 15% among school-going children and among that 80% have dyslexia, which is prevalent among 20% of the 21st-century population (Shaywitz et al., 2020). The Federal law supports people with SLD with the Individuals and Disabilities Education Act (IDEA) by providing special education services. It states that if the school suspects the child to be having a learning disability they have to be provided with evaluation. Later, an Individualized Educational Plan (IEP) has to be made for those who fall under this disability by personnel from school with their parents. Also, Free Appropriate Public Education (FAPE) has to be given to such children with the help of educational advocates. Further, they are also provided with additional test time, and assignments, using computers for typing rather than by writing, and smaller class sizes. Slowly academic expectations will change over time as the child develops with successful interventions and strategies (E. Luna, 2024).

Prevalence of Dyslexia globally

How prevalent is Dyslexia globally? Considering country-wise prevalence, there have been more studies in Western countries compared to Asian countries. Dyslexia in Asian countries is never a concern for most of the research but there are several findings about the prevalence of Dyslexia in different countries in Asia and neighboring continents. A study from China in the year 2013 (Sun et al., 2013) finds the prevalence rate of dyslexia in Qianjiang, a medium-sized city, is 3.9%. Bringing more detail to the study, it was done in 6350 students from 5 districts and 9 primary schools. They were administered with the Dyslexia Checklist for Chinese Children (DCCC). Another tool called PRS- Pupil Rating Scale Revised Screening for Learning Disabilities which consisted of 24 items: listening comprehension, time and spatial judgements, social behavior motion ability, memory and language ability was also administered. Students from classes 3-6 were taken for the study. Among the dyslexics, the ratio of boys to girls was 3:1. This study considered the parent's educational qualifications as it also had an impact on the prevalence of dyslexia and was inversely proportional (The higher the parent's educational qualifications, the lesser the possibility of dyslexia for their child). The verbal ability and personality of the mother, and the higher education of the father were some of the direct determinants of dyslexia according to this study.

A study (Aldakhil et al., 2023) in 2022 was conducted in Saudi Arabia on 2848, 2647 primary school male and female children respectively (class 3-6). The study used the Diagnostic Assessment Scale for Dyslexia, the Arabic reading test, and the Dyslexia Behavioural Indicator Scale. The results of the study showed that 5.86% of the total participants have Dyslexia. Among them, 3.83% were females and 6.54% were males, which is almost double.

In a study conducted in Lahore (Ashraf, M et al.,2011), Pakistan in 2011, wherein a total of 500 students were taken (250 boys, 250 girls). Tests administered were the Bangor Dyslexia Test, Standard Progressive Matrices, Slosson Intelligence test and the academic record of students were also referred to understand the prevalence of dyslexia. After analyzing descriptive and non-parametric statistics, 5.3% were found to have dyslexia. An increased number of boys were found to be dyslexic in the 6th and 7th grades but an equal proportion in the 8th grade.

Table 1: Prevalence of Dyslexia in South east Asia and Middle east.

Study Location	Year	Sample Size	Age/Grade	Prevalence Rate	Notes
China (Qianjiang) (Sun et al., 2013)	2013	6,350	Primary school (Grades 3-6)	3.9%	Higher prevalence in boys (3:1 ratio)
Saudi Arabia (Aldakhil et al., 2023)	2022	2,848	Primary school (Grades 3-6)	5.86%	Higher prevalence in boys (6.54%) compared to girls (3.83%)
Pakistan (Lahore) (Ashraf, M et al., 2011)	2011	500	Not specified	5.3%	Equal prevalence in boys and girls in the 8th grade; higher in boys in 6th and 7th grades

Prevalence of Dyslexia in India

While considering the Indian context, the importance of focusing towards this problem comes from the prevalence of this clinical condition which has been found through many studies across India. A "Two Decades of Research on Learning Disabilities in India (2000)", (Ramaa, 2000) where the author comes across all the studies conducted in the southern part of India from 1985 to 1998, and finds out there is a prevalence of 3%-7.5% among a total of 7201 children which the studies were conducted.

A later study (Padhy et al., 2015) conducted in 2015 in the state of Chandigarh, India finds the prevalence to be 3% among the 3600 total children. 33% of children fell under the high-risk category. However, the fact highlighted by the study is about the parents' knowledge about Learning Disability which is less than 5% of the entire population of 3600 between the classes of 3-4 that was recruited for this study. It can be majorly because of less awareness of such a condition among the teachers and parents or it can be because of the extra effort the teachers will have to put into creating a different academic structure for those children.

There are state-wise studies on the prevalence of SLD in India. A study from Chandigarh (Arun et al., 2013) was conducted on 2500 children from class VII to XII in two phases (Phase I: 1402 students, Phase 2: 108) The Assessment tool administered for SLD was NIMHANS SLD Assessment, Malin's Intelligence Scale for Indian Children and Standard Progressive Matrices were administered for IQ. The study found the prevalence rate to be 1.58% with a high prevalence among boys.

In the city of Belgaum, a study (Mogasale et al., 2011) done with the ethical clearance from Jawaharlal Nehru Medical College Institutional Ethical Committee found a whopping 15.17% of the 1134 children they had sampled. A six-level screening was done on these children which included scholastic backwardness, impaired vision, impaired hearing, and severe physical conditions that may interfere with their school performance, and IQ.

Considering the city of Mysore, a study (Rao et al., 2017) conducted in the year 2016 found the prevalence rate to be 13.67% and a great difference of 19.00% to 8.50% was found between boys and girls in 4 randomly selected state government schools of Mysore.

Thus, the prevalence rate in India can be considered to range from 1.58%- 15.17% from these studies done in India. The prevalence rate is seen to differ from state to state and thus, to solve such a developmental disorder, it has to be brought into the notice of common people and see it with utmost priority, or atleast have enough knowledge on such a issue that can be solved only with proper long term care and improvement steps.

Table 2: Prevalence of Dyslexia in India

Study Location	**Year**	**Sample Size**	**Age/Grade**	**Prevalence Rate**
Ramaa, 2000 (Southern India)	1985-1998, 2000 (published)	7,201	Not specified	3%-7.5%
Padhy et al. (Chandigarh)	2015	3,600	Classes 3-4	3%
Arun et al., 2013 (Chandigarh)	2013	2,500	Classes VII-XII	1.58%
Mogasale et al., 2011 (Belgaum)	2011	1,134	Not specified	15.17%
Rao et al., 2017 (Mysore)	2017	Not specified	Not specified	13.67%

Assessments for Specific Learning Disorders

Worldwide, there are several assessments for SLD on both online and offline platforms. Since we are focusing more on the online platform as we are creating an online assessment for Indian children, offline assessments with more accuracy and web-based as well as app-based assessments for SLD are collected for this market study.

The criteria we kept to collect web-based and offline assessments and any research papers that discussed such assessments are:

- “Specific Learning Disability”,
- “Dyslexia”,
- “SLD”,
- “Dysgraphia”,
- “Dyscalculia”,
- “Learning Disability”,
- “Child Learning Disability Assessment”
- “App based Working memory assessments”
- “Gamified Specific Learning Disability Assessments”
- “SLD apps India”
- “Learning disability assessments in India”.

With these search criteria, we filtered 8 web-based and app-based assessments, 6 accurate and reliable Specific Learning Assessments and Intelligence Tests.

Offline Assessments in India

In India, a widely used and recognized assessment for SLD is the NIMHANS SLD assessment Battery but we reviewed other assessments such as the AIIMS-Specific Learning Disability assessment, and the Diagnostic Test for Learning Disability (DTLD). These assessments were referred to understand the area assessed and the scores' structure, duration, analysis and distribution.

NIMHANS SLD Battery is a widely used assessment tool all over India and in some countries outside India as it is accurate and reliable. NIMHANS SLD Battery can be administered to children of grades 1-10 with different questionnaires that can bring accurate and reliable assessment results that have been tested and verified with years of implementation.

NIMHANS SLD Battery scores are used to determine whether a child has SLD or to understand whether he/she is performing according to his/her grade standard with the scores produced in this test. If the child is performing below 3 grades according to the scores obtained, then he /she is said to have SLD. NIMHANS SLD Battery has been suggested by the Gazette of India notification, Department of Empowerment of Persons with Disabilities.

DTLD or the Diagnostic Test for Learning Disability assesses 10 different areas such as Eye-hand coordination, figure-ground perception, figure constancy, position in space, Spatial relation, auditory perception, cognitive abilities, memory, receptive language, and expressive language. In these, the first six areas (1-6) assess visual and auditory perception and the rest cognitive functioning (7-10). DTLD provides a profile of the total scores he/she has obtained through the tests which can be later used for intervention in that particular area of impact. It does not certify the child to have LD but it can provide comprehensive data on the abilities of the child and areas where the child lagged can be improved with personalized intervention/improvement methods.

DALI or the Dyslexia Assessment for Languages in India is an Dyslexia Assessment Battery which provides assessment of dyslexia in languages which are used in Indian schools mainly: English, Hindi and a regional language Marathi during its first phase. DALI aims to expand its assessments to furthermore languages of India that improves the accuracy of assessment in India. This assessment battery evaluates children by reading ability and literacy learning potential. The battery includes literacy tests and mediator skills in all these three languages. It was standardized by assessing 1013 children. This battery is most reliable for children who are in bilingual education, which in India is most prevalent.

The AIIMS SLD assessment assesses areas such as Reading, Reading comprehension, writing, spelling, and arithmetic from classes 1-7. Each of these 5 categories has different scoring criteria which the person who administers (psychologist) has to score according to the performance of the child. This can help in improving the academic performance of the child by providing focus points that the child has to improve with effective remedial measures or intervention methods. The assessment is divided into mainly three categories: Intelligence test, Language test, and arithmetic with each having a different cut-off criterion to detect learning disability.

The Intelligence Tests we had referred to were Wechsler intelligence scale for children (WSIC), Stanford-Binet Test, Mallin’s Intelligence Scale for Indian Children (MISIC), RPM

(Raven's Progressive Matrices), Standard progressive matrices, Bhatia battery test. From which we adapted a version of Stanford-Binet Test for the development of our SLD Assessment App.

Table 3: List of standardized offline assessments used in Indian population

Assessment Tool	Author(s)	Year of Publication	Institution	Relevant Details
NIMHANS SLD Battery	NIMHANS	2002	National Institute of Mental Health and Neuro Sciences (NIMHANS)	Comprehensive battery for SLD assessment, widely used in clinical settings.
Dyslexia Assessment for Languages of India (DALI)	National Brain Research Centre	2018	National Brain Research Centre	Standardized tool for dyslexia screening in Indian languages.
Diagnostic Test of Learning Disability (DTLD)	Swarup & Mehta	1991	Maharaja Sayajirao University of Baroda	Focuses on identifying learning disabilities in school-aged children.
AIIMS SLD Battery	AIIMS	2015	All India Institute of Medical Sciences (AIIMS)	Comprehensive battery used for diagnosing SLD.

Web-Based and App-Based Assessments

Being a developmental issue, dyslexia, dysgraphia, dyscalculia and dyspraxia are addressed with utmost care in every country. There are a lot of web-based and mobile-based apps that are available for intervention for dyslexia. Considering the assessment of dyslexia, only a few platforms are backed by proper scientific research as well as are valid and reliable. With proper filtering, we have listed out some of the platforms that are reliable and valid which we have referred for developing a game-based assessment.

Dystech is an Australian company that has provided an AI-enhanced assessment application for the screening of Dyslexia with two different products: Dyscover and Dystutor. Dystech's Dyscover is a dyslexia assessment web-based application that assesses dyslexia with three sets of assessments: Phonological Awareness Assessment, Phonics Assessment, and Word Reading Assessment. They use the scores obtained by the child in these assessments to provide an intervention that will be personalized to them with the help of AI and is named Dystutor. The range of ages people can use these assessments starts from 5 and goes till 72 and has a subscription for assessing for more than 10 assessments.

The first screen is a mobile app-based assessment that was developed by the Orkids Foundation and aims to provide remediation, assessment and counseling for students with learning disabilities. It assesses SLD with 100 "Yes"/ "No"/ "Sometimes" questions for parents or anyone who has known the child at least for 6 months. These questions are based

on the behavioral aspects of the child and can be filled by a teacher who has been teaching/ observing the child for more than 6 months as well.

Neurolearning's Dyslexia Screening test is a fully paid assessment that is mobile app-based. The Dyslexia assessment consists of different areas of assessment such as Phonological processing, Working memory, visual Attention and naming speed.

Dynamilis by School Rebound is an app that helps to improve a child's handwriting through different gamified tasks. These tasks have to be done using an Apple iPad and Apple pencil with which the child has to trace the image or the shape which is provided on the screen. Dynamilis isn't an assessment app but an intervention app that has different types of tracing tasks. They provide an assessment of the child's handwriting with content that will be provided to them to copy onto the screen. Then, the handwriting will be assessed with their Artificial Intelligence from letter formation to pressure control, from gesture fluidity to digital dexterity. It also tracks the progress of the child with different levels of scoring.

Lexercise by Mind Information is an online platform that provides tests as well as intervention methods for every SLD. Lexercise provides a gamified version of the tests as well as connects the guardians with the experts that are partnering with them. They provide three different options through their website: Dyslexia Screening, Self-Paced Learning, and consultation with experts/psychologists. Lexercise also has the option to do Mississippi Dyslexia Screener for schools as it is required for every elementary school for kindergarten and first-grade students. These can be administered by teachers to their students.

TODO Math and TODO English are two mobile apps by Enuma that help children to learn with respect to the curriculum based on the U.S. All the teachings are done with game-based tasks and make it very involving and interesting for the child. In a similar line, TODO English also follows EFL standards to teach children English from age 5-10 and make sure that the child is proficient in English by the time he/ she reaches grade 2.

Market Gap

In India, the access, affordability and knowledge of SLD, their assessments as well as the intervention methods are still not known for most of the parent population. Only 11% of the parents out of 100 had awareness about SLD which is according to a study conducted in the city of Mangalore, India (Johney, A.et al., 2015).

Considering the awareness and knowledge about SLD among teachers in India, a study conducted in Tamil Nadu states that 73.5% of the teachers had awareness about SLD (Madhamani & Joseph, 2021). With data and the existence of only 1 recognized certifying assessment for SLD that is in accordance with the MINISTRY OF SOCIAL JUSTICE AND EMPOWERMENT which is the NIMHANS SLD Battery, it is difficult to administer the assessment by non-psychology professionals as well as to assess the performance of the child with the battery.

Even with plenty of intervention apps, there is a requirement for an assessment app that is reliable and valid and is aligned with every psychological scoring criterion. An app that is easy to use for both psychology and non-psychology professionals as well as helps in assessment and provides personalized intervention for the child according to the scores

obtained in the assessment so that it doesn't consume time for the teachers to make a structured and effective plan for such children.

CONCLUSION

SLD, commonly called Dyslexia, is still a neurodevelopmental issue that has to be still given more emphasis and brought into the lights of the population in India. As per the market research done from iKenzen, an app is necessary for this highly populated country like India where 24% of them are 0-14 age group children (Press Trust of India & Business Standard, 2024). In this developing country it is necessary to provide equal education to every child even if they have developmental disorders and it should not be a barrier but provide corrective measures so that learning will be accessible for them as well and they are equally treated as a child without such problems. Awareness among parents and the ability to accept and understand what SLD is, what the measures that a parent should take even if the child is diagnosed with it should be properly educated.

With this research about the apps available for SLD assessment in India, other than one assessment tool containing 100 questions with only three options for a parent or teacher exposed to the child minimum of 6 months becomes difficult to administer the assessment. No other research-backed, valid and reliable tools exist in a densely populated country like India. This can be a major reason for this developing country to hinder education equality among its young generation.

In the era of Artificial Intelligence, data science and machine learning, it is much required to apply this knowledge to this problem to help children overcome this issue. iKenzen Software Technology with its highly skilled team of researchers, software developers, data analysts and machine learning experts are trying to solve this issue with a product called N-Lite. N-Lite tries to adapt ML and data analysis methods to provide access to SLD assessments and help to get it done with easy access and less expense for the people of India.

REFERENCES

Ali Fahad Aldakhil, Mona Tawakkul Ebrahim, Hesham Fathy Gadelrab, Diagnostic survey of dyslexia and accompanying behavioural indicators in primary school students in Saudi Arabia, Research in Developmental Disabilities, Volume 134, 2023, 104424, ISSN 0891-4222,https://doi.org/10.1016/j.ridd.2023.104424. (https://www.sciencedirect.com/science/article/pii/S0891422223000021)

Altarelli I., Leroy F., Monzalvo K., Fluss J., Billard C., Dehaene-Lambertz G., and Galaburda A.M., Ramus F. Planum temporale asymmetry in developmental dyslexia: Revisiting an old question. Hum. Brain Mapp. 2014; 35:5717–5735. doi: 10.1002/hbm.22579.

Arun P, Chavan BS, Bhargava R, Sharma A, Kaur J. Prevalence of specific developmental disorder of scholastic skill in school students in Chandigarh, India. Indian J Med Res. 2013; 138(1):89-98. PMID: 24056561; PMCID: PMC3767262.

Arun, P., Chavan, B., Bhargava, R., Sharma, A., & Kaur, J. (2013). Prevalence of specific developmental disorder of scholastic skill in school students in Chandigarh, India. *PubMed*. https://pubmed.ncbi.nlm.nih.gov/24056561

Ashraf, M., & Majeed, S. (2011). Prevalence of dyslexia in secondary school students in Lahore. Pakistan Journal of Psychological Research, 26(1), 73+.https://link.gale.com/apps/doc/A259680824/AONE?u=anon~c8add06&sid=googleScholar&xid=8a4474e6

DOE (U.S. Department of Education). Individuals with Disabilities Education Act Amendments of 1995: Reauthorization of the Individuals with Disabilities Education Act (IDEA). Washington, DC: DOE; 1995.

E. Luna, R., M. D. (2024, March). What are specific learning disorders? https://www.psychiatry.org/patients-families/specific-learning-disorder/what-is-specific-learning-disorder

Galaburda A.M., Sherman G.F., Rosen G.D., Aboitiz F., Geschwind N. Developmental dyslexia: Four consecutive patients with cortical anomalies. Ann. Neurol. 1985; 18:222–233. doi: 10.1002/ana.410180210.

India's population is estimated at 1.4 billion, 24% in the 0-14 age bracket: UNFPA. (2024, April 17). www.business-standard.com. https://www.business-standard.com/economy/news/india-s-population-estimated-at-1-4-bn-24-in-0-14-age-bracket-unfpa-124041700171_1.html

International Dyslexia Association. (2015, May 7). DSM-5 Changes in Diagnostic Criteria for Specific Learning Disabilities (SLD) 1: What are the Implications?- *International Dyslexia Association*.https://dyslexiaida.org/dsm-5-changes-in-diagnostic-criteria-for-specific-learning-disabilities-sld1-what-are-the-implications/#:~:text=Q%3A%20What%20is%20SLD%20according,foundation%20for%20other%20academic% 20learning.

Johney, A., Baby, A.R., Lukose, A.M., Philip, A., Josephine, E.U., Joseph, T., Ebnezar, J.N., & Ps, M. (2015). To Assess the Knowledge of Parents Regarding Childhood Specific Learning Disabilities by Visiting a Selected Hospital at Mangalore. International Journal of Health Sciences and Research, 5, 268-273.

Madhamani A, Joseph A. Assessment of Knowledge and Awareness of Public School Teachers Towards Learning Disabilities in Children - An Institutional Based Cross-Sectional Study in Dharmapuri District, Tamil Nadu. J Family Med Prim Care. 2021 Jul; 10(7):2524-2528. doi: 10.4103/jfmpc.jfmpc_1869_20. Epub 2021 Jul 30. PMID: 34568130; PMCID: PMC8415642.

Mogasale VV, Patil VD, Patil NM, Mogasale V. Prevalence of specific learning disabilities among primary school children in a South Indian city. Indian J Pediatr. 2012 Mar; 79(3):342-7. doi: 10.1007/s12098-011-0553-3. Epub 2011 Sep 2. PMID: 21887581.

Padhy SK, Goel S, Das SS, Sarkar S, Sharma V, Panigrahi M. Prevalence and Patterns of Learning Disabilities in School Children. Indian J Pediatr. 2016 Apr; 83(4):300-6. doi: 10.1007/s12098-015-1862-8. Epub 2015 Sep 3. PMID: 26334861.

Rao, S., Raj, S., Ramanathan, V., Sharma, A., Dhar, M., Thatkar, P. V., & Pal, R. (2017). Prevalence of dyslexia among school children in Mysore. *International Journal of Medical Science and Public Health*, *6*(1), 159. https://doi.org/10.5455/ijmsph.2017.05082016592

S., Ramaa. (2000). Two decades of research on learning disabilities in India. Dyslexia (Chichester, England). 6. 268-83. 10.1002/1099-0909(200010/12)6:4<268:: AID-DYS177>3.0.CO;2-A.

Shaywitz SE, Shaywitz JE, Shaywitz BA. Dyslexia in the 21st century. Curr Opin Psychiatry. 2021 Mar 1; 34(2):80-86. doi: 10.1097/YCO.0000000000000670. PMID: 33278155.

Sun Z, Zou L, Zhang J, Mo S, Shao S, Zhong R, Ke J, Lu X, Miao X, Song R. Prevalence and associated risk factors of dyslexic children in a middle-sized city of China: a cross-sectional study. PLoS One. 2013; 8(2): e56688. doi: 10.1371/journal.pone.0056688. Epub 2013 Feb 15. PMID: 23457604; PMCID: PMC3574109.

Tallal P, Galaburda AM, Llinas RR, von Euler C (Eds): Temporal information processing in the nervous system: special reference to dyslexia and dysphasia. Ann N Y Acad Sci 1993, 682:1-442. 17.

Tallal P, Miller S, and Fitch RH: Neurobiological basis of speech: A case for the pre-eminence of temporal processing. Ann N Y Acad Sci 1993, 682: 27-47. 16.

Wright BA, Bowen RW, Zecker SG: Non-linguistic perceptual deficits associated with reading and language disorders. Curr Opin Neurobiol 2000, 10:482-486.

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