IJSCIA

International Journal of Scientific Advances
ISSN: 2708-7972
Volume: 4 | Issue: 6 | Nov – Dec 2023 Available Online: www.ijscia.com
DOI: 10.51542/ijscia.v4i6.20

# Early Detection of Learning Disorders and Attention Deficit/Hyperactivity Disorder Among Children in Elementary School

**Yunias Setiawati*, Izzatul Fithriyah, Melati Wahyurini, Dianasari, Dhenni Hartopo, Lia Jessica, and Andi Gita Fitri Martasiyah Dala**

Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

E-mail: yunias.setiawati@fk.uniar.ac.id; izza.unair@gmail.com; melatimels03@gmail.com; dianasari.prawoto.spkj@gmail.com; dhenni.hartopo@gmail.com; lijezz_89@yahoo.co.id; andigita.fmd@gmail.com

*Corresponding author details: Yunias Setiawati; yunias.setiawati@fk.uniar.ac.id

**ABSTRACT**

***Objective:*** Learning disorder is a problem that is often encountered in children in school, which can hinder their learning ability. Early detection of learning disorders involves observing the signs and symptoms of learning disorders in children, such as difficulty in reading, writing, counting, or memorizing information. In the early detection stage, the use of valid and reliable assessment tools can help identify children at risk of learning disorders. After early detection, the next step is appropriate management to help children overcome learning disorders. The management of children's learning disorders in schools involves a multidisciplinary approach that involves cooperation between teachers, psychologists, parents, and medical personnel. ***Method:*** Screening of 126 elementary school students in Surabaya using the Colorado Learning Difficulties Questionnaire (CLDQ) to assess the presence of learning disorders. The Indonesian Hyperactivity Child Behaviour Assessment Scale (SPPAHI) is used to assess the presence of attention-deficit/hyperactivity disorder (ADHD) in Indonesian population. ***Results:*** Screening with CLDQ resulted 22 (17.5%) of 126 children required attention and referrals related to learning disorders in various aspects and 104 children (82.5%) within normal limits. Screening with SPPAHI showed 19 children (15.1%) had a high risk of ADHD and 107 children (84.9%) within normal limits. The study found 86.4% of children with learning disorders has a high risk of ADHD. Education of parents of children with learning disorders has been carried out as a follow-up to early detection. ***Conclusion:*** Early detection of learning disorders and parental education are useful in the management of learning disorders.

***Keywords:*** learning disorder; early detection; children; role of teachers; role of parents; psychological wellbeing

## INTRODUCTION

Learning disorders in children are problems that are often faced at school. Learning disorders can affect a child's learning ability, academic achievement, and social-emotional development. Therefore, early detection and management of children's learning disorders in schools is important to optimize children's learning potential and provide the necessary support. Early detection of learning disorders in children allows early recognition of symptoms that may appear, so that appropriate intervention can be given as soon as possible. Proper management is also important in overcoming children's learning disorders, including a holistic approach, involving various parties such as teachers, parents, and competent medical personnel [1,2].

Learning disorders in children are conditions when children experience obstacles or difficulties in mastering academic skills such as reading, writing, arithmetic, or speaking, even though they have normal or even above average intelligence. Learning disorders can hinder a child's learning ability and affect their academic performance [3,4].

Learning disorders in children usually appear early in school, although symptoms can become more pronounced as children enter more complex learning stages. Some common types of learning disorders include [3–10].

- *Dyslexia:* A learning disorder that affects the ability to read, recognize words, or understand the meaning of what is read.
- *Dyscalculia:* A learning disorder that affects the ability to count or understand mathematical concepts.

- *Dysgraphia:* A learning disorder that affects the ability to write, both in terms of fine motor coordination and written expression.

- *Language Disorders:* Learning disorders that affect the ability to speak, understand, or use language effectively.

- *Attention Disorder and Hyperactivity (ADHD):* A learning disorder that involves problems paying attention, concentrating, or controlling behaviour.

Learning disorders in children can have a long-term impact on their academic, social, and emotional development. Therefore, it is important to recognize the signs of learning disorders in children and seek professional help if needed, such as support from psychologists, therapists, or medical personnel who are competent in the field of child education [11–14].

There is no definite data on the prevalence of learning disorders in children in Indonesia and the world, because this figure can vary depending on the research methodology, the definition of learning disorders used, and the population studied. However, several studies and estimates have been conducted to provide a general picture of the demographics of learning disorders in children in Indonesia and the world [12,15].

- *Dyslexia:* The worldwide prevalence of dyslexia is estimated to be around 5-10% of the schoolchild population. Studies in Indonesia show that the prevalence of dyslexia ranges from 2-10% in school-age children.

- *Dyscalculia:* Data on the prevalence of dyscalculia in Indonesia is limited, but global estimates suggest that the prevalence of dyscalculia in school children ranges from 3-6%.

- *Dysgraphia:* The prevalence of dysgraphia in Indonesia is not known with certainty, but it is estimated that around 4-15% of school-age children in the world experience this disorder.

- *Language Disorders:* The prevalence of language disorders in children in the world is estimated to be between 5-8%. Data on the prevalence of language disorders in children in Indonesia is still limited.

- *ADHD:* The prevalence of ADHD in children in the world is estimated to be around 5-10%. Data on the prevalence of ADHD in children in Indonesia is also limited, but is estimated to range from 3-10%.

The prevalence of learning disorders can differ across different populations, depending on cultural, environmental, and access to health and education factors.

The diagnosis of a learning disorder should be made by competent health professionals, such as psychologists or educational professionals, based on a comprehensive evaluation of the child concerned [12,15].

Learning disorders in children can have a variety of etiologies or causes. Some factors that can play a role in causing learning disorders in children include neurobiological factors, genetic factors, environmental factors, psychosocial factors, health factors, and educational actors. Learning disorders in children are often the result of a combination of several different factors, and each child may have a unique cause for the learning disorder they are dealing with. Therefore, a thorough evaluation by an experienced health or educational professional is necessary to identify causal factors that may be involved in learning disorders in children and plan appropriate interventions [11–13,16].

Learning disorders in children can have a significant impact on various aspects of their lives, including academic, social, and emotional. Some of the impacts that may arise due to learning disorders in children include [1,16,17].

- Low academic performance
- Low self-esteem
- Emotional disorders
- Social disorders
- Obstacles in career development

Here are some steps that can be taken to deal with learning disorders in children [12,13,15,16,18].

- Identification and evaluation of learning disorders
- Creation of an integrated response plan
- Specific academic interventions
- Emotional support and motivation
- Collaboration between parents, teachers, and medical professionals
- Counseling to children, parents, and teachers
- Long-term prevention and monitoring

## MATERIALS AND METHODS

This study is a quantitative descriptive research. This study used a sampling method purposive sampling. The sample selected was Balongsari state elementary school students in Surabaya, male and female, from grade one to grade five. One hundred and twenty-six children were obtained as samples that fit the criteria. This study was conducted in May 2023.

The Colorado Learning Difficulties Questionnaire (CLDQ) is used to assess the presence of learning disorders. The Indonesian Hyperactivity Child Behaviour Assessment Scale (SPPAHI) was used to assess the presence of ADHD in the sample. Prevalence of learning disorder and ADHD in the sample then counted and tabulated.

## RESULTS

**TABLE 1:** Screening Results using CLDQ and SPPAHI.

| Psychometrics | Total |
|---|---|
| CLDQ | |
| Need attention and referrals | 22 (17,5%) |
| Within normal limits | 104 (82,5%) |
| SPPAHI (all students) | |
| High risk of ADHD | 19 (15,1%) |
| Within normal limits | 107 (84,9%) |
| SPPAHI (students with learning disorders) | |
| High risk of ADHD | 19 (86,4%) |
| Within normal limits | 3 (13,6%) |

Result Screening using CLDQ and SPPAHI psychometrics obtained an overview of the risk of learning disorders and ADHD in the sample of 126 children. As shown in table 1, Screening with CLDQ showed that 22 (17.5%) of 126 children required attention and referrals related to learning disorders in various aspects and 104 children (82.5%) within normal limits. Screening with SPPAHI showed 19 children (15.1%) had a high risk of ADHD and 107 children (84.9%) within normal limits. The study found 86.4% of children with learning disorders had a high risk of ADHD.

**TABLE 2:** Demographic data of students with learning disabilities.

| Student | Total |
|---|---|
| Gender | |
| Boy | 15 (68,2%) |
| Girl | 7 (31,8%) |
| Age | |
| 7 | 3 (13,6%) |
| 8 | 5 (22,7%) |
| 9 | 1 (4,6%) |
| 10 | 9 (40,9%) |
| 11 | 4 (18,2%) |
| School grade | |
| 1 | 6 (27,3%) |
| 2 | 2 (9,1%) |
| 3 | 5 (22,7%) |
| 4 | 7 (31,8%) |
| 5 | 2 (9,1%) |

The study found 22 out of 126 children needed attention and referrals related to learning disorders, as shown in table 2. The children assessed as needing attention and referrals related to learning disorders consisted of 15 (68.2%) boys and 7 (31.8%) girls. The age range is between 7 to 11 years with the distribution of 7 years old as many as 3 children (13.6%), 8 years old as many as 5 children (22.7%), 9 years old as many as 1 child (4.6%), 10 years old as many as 9 children (40.9%), and 11 years old as many as 4 children (18.2%). Grade 1 students as many as 6 children (27.3%), grade 2 students as many as 2 children (9.1%,) grade 3 students as many as 5 children (22.7%), grade 4 students as many as 7 (31.8%), and grade 5 students as many as 2 children (9.1%).

**TABLE 3 :** Education and occupation of the Mother of students with learning disabilities.

| Parents | Total |
|---|---|
| Recent Education | |
| Elementary school | 2 (9,1%) |
| Junior high school | 8 (36,4%) |
| Senior high school | 10 (45,5%) |
| Vocational school | 2 (9,1%) |
| Work | |
| Housewives | 6 (27,3%) |
| Private employees | 1 (4,6%) |
| House maid | 1 (4,6%) |
| Self employed | 14 (63,6%) |

The backgrounds of parents of children who need attention and referrals related to learning disorders, shown in table 3, vary with parents with the last education of elementary school as many as 2 people (9.1%), junior high school as many as 8 people (36.4%), high school as many as 10 (45.5%), and vocational school as much as 2 (9.1%). The most parents' jobs are self-employed, with variations as follows, housewives as many as 6 people (27.3%), private employees as many as 1 person (4.6%), domestic assistants (ART) as many as 1 person (4.6%), and self-employed as many as 14 people (63.6%).

## DISCUSSION

Learning disorders are common developmental disorders. In general, learning disorders are found in 5 percent of school-age children. Some researchers argue that the actual prevalence can reach 15 to 20 percent [19]. In Indonesia itself, there is no exact figure regarding the prevalence of learning disorders. From the results of our examination of 126 students at elementary school in Surabaya, it was found that 22 students (17.5%) were at high risk for learning disorders. This figure corresponds to the prevalence of learning disorders in general.

This study used CLDQ as a screening tool to find out whether subjects have a high risk of learning disorders which include reading skills, social cognition, social anxiety, spatial abilities, and mathematics [20]. Parents are asked to fill out CLDQ that has been translated in Indonesian according to the conditions of each subject. CLDQ is a measurement taken by parents designed to screen for academic and behavioural difficulties in the school-age population. The 20 questions were divided into two subscales designed to screen for learning difficulties, defined as behaviours that tend to indicate the possibility of a learning disorder [20].

When a child has a learning disorder, it means that the child has difficulty in one or more areas of learning, even when the overall intelligence or motivation to learn is not impaired. If the child only has a disorder in one area, it can be said that the child has a specific learning disorder (SLD) [21].

In the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) published in 2013, the characterization of SLD has been updated. SLD consists of four key elements: (1) characterized by constant difficulty in learning and using one or more academic domains (i.e., reading comprehension, arithmetic calculations and/or written expression) for at least six months despite the intervention of target skills has been carried out. Given; (2) academic skills below what is expected at the individual's age, which interfere with functioning at school, at work, and in activities of daily living; (3) SLD is diagnosed at the age of onset, at school age, or when high-level skills are demanded and (4) those with intellectual development impairments, global developmental delays, hearing or vision impairments, psychosocial difficulties, language differences and who are less proficient in the language of academic instruction are excluded [21,22].

Learning disorders are found in 70% of children with ADHD, with learning disabilities in written expression twice as common (65%) as learning disabilities in reading, math, or spelling. Children with learning disorders and ADHD have more severe learning problems than children with learning disorders without ADHD. Given the high comorbidity rate of learning disorders and ADHD, we also screened subjects for the possibility of ADHD [4,23]. ADHD screening was carried out by filling out SPPAHI questionnaires by the parents of each subject. SPPAHI is an ADHD early detection instrument consisting of 35 questions in Indonesian. From the results of the filling, it was found that 86.4% (19 children) of subjects who required attention and referrals related to learning disorders had a high risk of having a high risk of ADHD. The number is 15.1% of students overall. This percentage is higher than the prevalence of ADHD in children with learning disorders from previous studies.

Both a diagnosis of a learning disorder and a diagnosis of ADHD should only be established through a clinical interview [24–26]. Therefore, we conducted interviews with subjects who have a high risk of learning disorders and ADHD and their parents. Both groups of children with learning disorders and ADHD have academic performance that is often below their full potential. To optimize treatment, it is important to distinguish academic difficulties associated with ADHD from difficulties due to learning disorders. If ADHD occurs along with learning disorders, then the child needs to be treated to overcome both disorders with interventions in the school environment and also at home [5]. For some children, these learning difficulties are temporary and can be corrected with appropriate intervention. However, from 5% to 15% of children, this disorder persists and is significant, despite appropriate interventions [24].

This study has the limitation that it was only conducted in one elementary school. Larger studies can be conducted to get a more representative picture of the child population in Indonesia.

## CONCLUSION

Learning disorder is a disorder that prevents children from developing optimally. Early detection of learning disorders is needed so that intervention management is carried out for the good of children. The role of teachers and people is very important in dealing with children with all forms of learning disorders and to keep their psychological wellbeing.

## CONFLICT OF INTEREST

None.

## ETHICS CONSIDERATION

All procedures were approved by the Ethics Research Committee of the Institutional Review Board of Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia (2512/UN3.1.10/PM/2023)

## FUNDING

This research was funded by Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.

## REFERENCES

[1] Hakkarainen A, Holopainen L. Learning difficulties challenge secondary education in organizing educational support. 2016, pp. 197–215.

[2] Handler SM, Fierson WM, the Section on Ophthalmology and Council on Children with Disabilities American Association for Pediatric Ophthalmology and Strabismus and American Association of Certified Orthoptists AA of O. Learning Disabilities, Dyslexia, and Vision. *Pediatrics* 2011; 127: e818–e856.

[3] Franklin D. *Helping Your Child with Language-Based Learning Disabilities*. Oakland: New Harbinger Publications, Inc., 2018.

[4] Mayes SD, Calhoun SL, Crowell EW. Learning disabilities and ADHD: Overlapping spectrum disorders. *J Learn Disabil*; 33. Epub ahead of print 2000. DOI: 10.1177/002221940003300502.

[5] Masi L. ADHD and Comorbid Disorders in Childhood Psychiatric Problems, Medical Problems, Learning Disorders and Developmental Coordination Disorder. *Clinical Psychiatry*; 1. Epub ahead of print 2015. DOI: 10.21767/2471-9854.100005.

[6] Chinn, Steve. *The Routledge International Handbook of Dyscalculia and Mathematical Learning Difficulties*. 2015.

[7] Sasono C, Setiawati Y, Irwanto I. Correlation Between Children's Temperament and Risk Factor of Attention Deficit/Hyperactivity Disodrer in Elementary School. *Biomolecular and Health Science Journal* 2019; 2: 17.

[8] Setyanisa AR, Setiawati Y, Irwanto I, et al. Relationship between Parenting Style and Risk of Attention Deficit Hyperactivity Disorder in Elementary School Children. *Malaysian Journal of Medical Sciences* 2022; 29: 152–159.

[9] Lorient S, Setiawati Y, Hidayati H, et al. Relationship between Sociodemographic Factors and Caregiver Burden Among Mothers of Elementary School Students with ADHD Symptoms in Surabaya: A Cross-sectional Study. *International Journal of Scientific Advances*; 4. Epub ahead of print 1 January 2023. DOI: 10.51542/ijscia. v4i3.29.

[10] Nastiti NP, Dharmawan A, Aziz ARH, et al. The Correlation Between Congenital Heart Disease and The Risk of ADHD in Children. *International Journal of Scientific Advances*; 4. Epub ahead of print 2023. DOI: 10.51542/ijscia. v4i3.24.

[11] Sanfilippo J, Ness M, Petscher Y, et al. Reintroducing dyslexia: Early identification and implications for pediatric practice. *Pediatrics*; 146. Epub ahead of print 1 July 2020. DOI: 10.1542/peds.2019-3046.

[12] Grigorenko EL, Compton DL, Fuchs LS, et al. Understanding, Educating, and Supporting Children with Specific Learning Disabilities: 50 Years of Science and Practice. *American Psychologist*. Epub ahead of print 2019. DOI: 10.1037/amp0000452.

[13] Fletcher JM, Grigorenko EL. Neuropsychology of learning disabilities: The past and the future. *Journal of the International Neuropsychological Society* 2017; 23: 930–940.

[14] Sukmajaya AC, Lusida MI, Soetjipto, et al. Systematic review of gut microbiota and attention-deficit hyperactivity disorder (ADHD). *Annals of General Psychiatry*; 20. Epub ahead of print 1 December 2021. DOI: 10.1186/s12991-021-00330-w.

[15] Bos CS, Vaughn S. *Strategies for teaching students with learning and behavior problems*. Allyn and Bacon, 1994.

[16] Fletcher JM, Wood FB, Olson RK. *Rethinking Learning Disabilities Twin Study of the NAPLAN View project Dyslexia program project View project*, https://www.researchgate.net/publication/242685581 (2001).

[17] Antonelli L, Bilocca S, Borg D, et al. Drama, Performance ethnography, and self-esteem: Listening to youngsters with dyslexia and their parents. *Sage Open*; 4. Epub ahead of print 11 June 2014. DOI: 10.1177/2158244014534696.

[18] Fletcher JM, Alan Coulter W, Reschly DJ, et al. Alternative approaches to the definition and identification of learning disabilities: Some questions and answers. *Ann Dyslexia* 2004; 54: 304–331.

[19] Ismail R, Mohamed H, Soltan B. Prevalence of learning disabilities among a sample of primary school students. *The Scientific Journal of Al-Azhar Medical Faculty, Girls* 2019; 3: 125.

[20] Patrick KE, Mccurdy MD, Chute DL, et al. Clinical utility of the colorado learning difficulties questionnaire. *Pediatrics*; 132. Epub ahead of print 1 November 2013. DOI: 10.1542/peds.2013-1530.

[21] Learning Disorders in Children | NCBDDD | CDC, https://www.cdc.gov/ncbddd/developmentaldisabilities/learning-disorder.html (accessed 5 August 2023).

[22] American Psychiatric Association. DSM-5 Diagnostic Classification. In: *Diagnostic and Statistical Manual of Mental Disorders*. 2013. Epub ahead of print 2013. DOI: 10.1176/appi.books.9780890425596.x00diagnosticclassification.

[23] N.H F, Setiawati Y. Interaksi Faktor Genetik dan Lingkungan pada Attention Deficit/Hyperactivity Disorder (ADHD). *Jurnal Psikiatri Surabaya* 2017; 6: 98.

[24] Blanchet M, Assaiante C. Specific Learning Disorder in Children and Adolescents, a Scoping Review on Motor Impairments and Their Potential Impacts. *Children*; 9. Epub ahead of print 1 June 2022. DOI: 10.3390/children9060892.

[25] Setiawati Y, Mukono H, Wahyuhadi J, et al. Is there an Effect of Serotonin on Attention Deficit Hyperactivity Disorder. *Indian J Public Health Res Dev* 2020; 11: 1745.

[26] Setiawati Y, Mukono H, Wahyuhadi J, et al. The Influence of Lead (Pb), Zinc (Zn), Ratio Lead (Pb) to Zinc (Zn) in Attention Deficit Hyperactivity Disorder (ADHD). *Indian J Public Health Res Dev* 2019; 10: 1497.