



# Analyzing the Specific Reading and Writing Problems in Children with Ld.: Pre Natal and Post Natal Cases by Novel Approach

Dhanya P.R.

MSW, SMLD, DMLD, MSC Applied Psychology, Dept. of Applied psychology, India

Author's Mail Id: [hanyaagnivesh@gmail.com](mailto:hanyaagnivesh@gmail.com).

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**Abstract**—for more than a century there has been speculation that the antecedents of mental retardation, learning disabilities, personality disorders, and similar educational and behavioral problems may be associated with anomalies of pregnancy, birth, and infancy. While most of the substantive research in this area has taken place during the past 25 years, its antecedents can be directly traced to the late 19th century. Children with learning disabilities are a heterogeneous group.<sup>3</sup> These children are a diverse group of individuals, exhibiting potential difficulties in many different areas. For example, one child with a learning disability may experience significant reading problems, while another may experience no reading problems whatsoever, but has significant difficulties with written expression. We review research on the cognitive, linguistic, and other learning challenges experienced by adults with learning disabilities and the use of accommodations that facilitate learning. We focus mainly on research with college students because the empirical research base is more comprehensive for them than for other adult learners with learning disabilities.<sup>2</sup> The research paper also includes neurocognitive research that has concentrated mainly on children with learning disabilities, although adolescents and adults have been included in the research to some degree. A brief overview of learning disabilities before turning to a more specific discussion of reading disabilities, the most prevalent and best studied class of learning disabilities. Most of this research concentrates on the reading and comprehension of words and sentences. In this research work we are describing the complete statistical analysis for particular validity and reliability of proposed questionnaire also included.<sup>1</sup>

**Keywords**—ADHD, Comorbidity, Risk factors, Referral, Specific learning disability, SPSS analysis, LD, specific disorder, children problems, reading and writing issues, etc.<sup>9</sup>

**Background:** Specific learning disability (SLD) is an important cause of academic underachievement among children, which often goes unrecognized, due to lack of awareness and resources in the community. Not much identifiable data is available such children, more so in Indian context. The objectives of the study were to study the demographic profile, risk factors, co-morbidities and referral patterns in children with specific learning disability.

**Methods:** The study has a descriptive design. Children diagnosed with SLD over a 5 years' period were included, total being 2015. The data was collected using a semi-structured preform, (based on the aspects covered during child's comprehensive assessment at the time of visit), which included socio-demographic aspects, perinatal and childhood details, scholastic and referral details, and comorbid psychiatric disorders.

**Results:** Majority of the children were from English medium schools, in 8-12 years' age group, with a considerable delay in seeking medical help, were referred mostly by the teachers for academic issues. Most of them had all the three disabilities-dyslexia, dysgraphia and dyscalculia. 38.56% of children had ADHD. Psychological maternal stress, developmental issues and various co-morbidities were accompanying in many cases, of which speech delay and fine motor issues were more in children having comorbid ADHD.

**Conclusions:** Awareness, early identification and referral to appropriate services is crucial to deal with the challenge of learning disability. Health professionals should look for early signs in routine visits of children and co-morbidities, particularly ADHD, should be adequately taken care of. Role of media and education system is crucial for its de-stigmatization in community.

## I. INTRODUCTION

Learning disabilities is an umbrella term that encompasses several types of developmental disorders evident as

difficulties in learning specific academic or language skills, typically reading, mathematics, oral language communication, writing, and motor performance (e.g., coordination; see American Psychiatric Association,

2000, Diagnostic and Statistical Manual of Mental Disorders, 4th ed.). Learning disabilities have been historically difficult to define in part because they are not a unitary or homogeneous disorder and in part because they have been defined through exclusionary rather than inclusionary criteria. The rationale for an exclusionary definition remains relevant today. The diagnosis of learning disabilities is reserved for individuals with unexpected academic underachievement that cannot be attributed to known causes, such as sensory disorders, general intellectual disability, significant emotional or behavioral disorders, poverty, language differences, or inadequate instruction (Fletcher et al., 2007)

It is important to note that consensus on an evidence-based definition of learning disability has not yet been reached. There is much debate on how to improve definitions and legal criterion setting for the diagnosis and remediation of learning disability. Further research is needed to arrive at an evidence-based definition to guide research and practice.1.

#### **READING DISABILITIES:**

Some 80-90 percent of students with learning disabilities are reported to exhibit significant difficulty with reading (Kavale and Reese, 1992; Lerner, 1989; Lyon et al., 2001). The term reading disability is often used interchangeably with the terms dyslexia, reading disorder, and learning disabilities in reading. Adults with reading disabilities experience lower.

#### **WRITING DISABILITIES:**

Individuals with learning disabilities often demonstrate difficulties with written expression. Findings from the fields of sociolinguistics, cognitive psychology, and neuro-linguistics reveal that certain cognitive processes (e.g., working memory, executive functioning, orthographic awareness) influence specific types of written expression (Berninger and Winn, 2006; Mc-Cutchen, 2006; Shanahan, 2006; Torrance and Galbraith, 2006) and so provide information critical to the design of effective intervention and accommodation. Strategic learning relies not only on the cognitive abilities of writers, but also on their experiences, self-efficacy beliefs, and motivation (Pajares and Valiante, 2006). Sociolinguistic research verifies that written expression is influenced by affective, situation, and social variables (Englert, Mariage, and Dunsmore, 2006). Research on all of the processes known to affect writing (cognitive, linguistic, affective, and social) is necessary to effective assessment, intervention, and accommodation of adolescents and adults with learning disabilities.

#### **BRAIN STRUCTURE AND FUNCTION;**

A number of anatomical neuroimaging studies (research that uses magnetic resonance imaging, MRI, to measure gray and white matter volumes across brain regions) have identified structural differences, such as reduced gray matter volume, in the brains of people with reading disabilities. These differences have been found in several of the left hemisphere (LH) regions that functional brain

imaging show to be involved in reading, including the temporoparietal and occipitotemporal areas (Brambati et al., 2004; Brown et al., 2001; Eckert et al., 2003; Kronbichler et al., 2008; Silani et al., 2005). Using a recently developed MRI technique known as diffusion tensor imaging (DTI), studies show differences in white matter tracts for those with reading disabilities. Individuals with reading disabilities have atypical white matter development in critical LH pathways linking the major reading areas. This finding suggests reduced myelin in the axonal fibers connecting distributed brain areas that form the reading circuits of the brain (Beaulieu et al., 2005; Keller and Just, 2009; Klingberg et al., 2000; Niogi and McCandliss, 2006).

#### **I DISABILITY, IMPAIRMENT AND HANDICAP**

Disability can be defined in one of the following ways:

- It is a restriction or lack of ability (resulting from impairment) to perform an activity in the manner or within the range considered normal for a human being.
- It is a condition that substantially limits one or more major life activities.
- It is a Physical or mental impairment that limits or restricts the condition, manner or duration under which an average person in a population can perform a major activity.
- It is a medical, emotional, mental or behavioral need that will require on-going assistance and support.

Impairment: Loss or abnormality of psychological, physiological or anatomical structure or functions

## **II. CAUSES OF DISABILITIES**

Disability can be traced to three (3) distinct areas in human development namely:

- Pre-natal.
- Peri-natal.
- Post-natal.

Pre-natal stage: These include maternal diet, toxemia, bleeding and pre-maturity, chromosome abnormalities, genetic diseases e.g phenylketonuria (PKU), mutagen or agents causing changes in genes, X-rays etc. All these may cause brain and other defects in the child. Peri-natal stage: These include trauma, human error, lack of oxygen (anoxia) accidents, prolonged birth and complicated labour, breach delivery, forceps-delivery, etc can cause damage to brain, certain organs and cells. Post-natal stage: Notable among the causes are poison ( e.g lead in sauce pans) lead to slow or low intellectual functioning capacity of a child. Paints, coating on walls, carbon monoxide can cause health issues and possibly impairment.

## **III. TYPES OF DISABILITY**

There are three (3) traditional disabilities commonly referred to as sensory disabilities: 1) Intellectual Disability 2) Hearing impairment 3) Visual impairment However,

there are many other disabilities including: 1) Social, Emotional and Behaviour Disorder 2) Autism Spectrum Disorders 3) Physical Disability 4) Learning Disability/Difficulties/Disorders.

Learning disabilities may also be mild, moderate, or severe. Students differ too, in their coping skills. According to Bowe (2005), "some learn to adjust to LD so well that they 'pass' as not having a disability, while others struggle throughout their lives to even do 'simple' things. Despite these differences, LD always begins in childhood and always is a life-long condition" (p. 71). Over the years, parents, educators, and other professionals have identified a wide variety of characteristics associated with learning disabilities (Gargiulo, 2004). One of the earliest profiles, developed by Clements (1966), includes the following ten frequently cited attributes: • Hyperactivity • Impulsivity • Perceptual-motor impairments • Disorders of memory and thinking • Emotional lability • Academic difficulties • Coordination problems • Language deficits • Disorders of attention • Equivocal neurological signs

Almost 35 years later, Lerner (2000) identified nine learning and behavioral characteristics of individuals with learning disabilities: • Disorders of attention • Reading difficulties • Poor motor abilities • Written language difficulties • Oral language difficulties • Social skills deficits • Psychological process deficits • Quantitative disorders • Information processing problems.

#### **PRE NATAL AND POST NATAL CASES:**

Pregnancy care consists of prenatal (before birth) and postpartum (after birth) healthcare for expectant mothers. It involves treatments and trainings to ensure a healthy prepregnancy, pregnancy, and labor and delivery for mom and baby.

Pre- and post-natal expenses would mean costs pertaining to ultrasound, regular checkups, doctor's consultation fee, and medicines and so on. These are similar to pre- and post-hospitalization expenses that are admissible under a standard health insurance policy.

Pre-Pregnancy and prenatal care can help prevent complications and inform women about important steps they can take to protect their infant and ensure a healthy pregnancy. With regular prenatal care women can: Reduce the risk of pregnancy complications.

Pregnancy care consists of prenatal (before birth) and postpartum (after birth) healthcare for expectant mothers. It involves treatments and trainings to ensure a healthy pre-pregnancy, pregnancy, and labor and delivery for mom and baby.

The postnatal period can be defined as the first 6-8 weeks after birth. Postnatal care should be a continuation of the care the woman has received through her pregnancy, labour and birth and take into account the woman's individual needs and preferences.

#### **LEARNING DISABILITIES**

A learning disability is a neurological disorder. In simple terms, a learning disability results from a difference in the way a person's brain is "wired." Children with learning disabilities are as smart as or smarter than their peers.

#### **Includes Diseases: Attention deficit hyperactivity disorder.**

The three main types of learning disabilities are: reading disabilities, written language disabilities, and math disabilities. Each type of LD can include several different disorders.

Learning disability is not a disease, so it doesn't require a cure and, with support, someone with a learning disability can succeed both at school and in work. Having a learning disability means that people find it harder to learn certain life skills. The problems experienced vary from person to person, but may include aspects such as learning new things, communication, managing money, reading, writing, or personal care.

A severe learning disability will be identified at birth or in early childhood. Someone who has a severe learning disability will: have little or no speech. Find it very difficult to learn new skills. Need support with daily activities such as dressing, washing, eating and keeping safe.

Learning disabilities have no cure, but early intervention can lessen their effects. People with learning disabilities can develop ways to cope with their disabilities. Common signs that a person may have learning disabilities include the following: Problems reading and/or writing. Problems with math. Poor memory.

#### **CAUSES OF LEARNING DISORDER**

- Family history and genetics. A family history of learning disorders increases the risk of a child developing a disorder.
- Prenatal and neonatal risks. ...
- Psychological trauma. ...
- Physical trauma. ...
- Environmental exposure.

Learning disabilities are problems with reading, spelling or math's. Although learning disabilities can be challenging for your child, your child can still learn and be successful. Difficulty following directions – especially if the student is hearing the information for the first time or there are several steps to remember. Daydreaming. Difficulty copying from the board. Trouble remembering assignments and doing them correctly.

- Signs and symptoms of learning disabilities:
- Ages 10-13.
- Early detection of developmental differences may be an early signal of a learning disability and problems that are spotted early can be easier to correct.

### I Related Work, ROL.

**Lingfei Liu, Jia Wang, AT, EL [01]** Several prenatal and perinatal factors have been found to be associated with developmental dyslexia (reading disorder) in alphabetic language. Given the absence of relevant studies of Chinese children, the present study tries to investigate these risk factors. A total of 45,850 students were recruited from grades three to six, from seven cities of Hubei province. Dyslexia in Chinese was diagnosed based on children's clinical symptoms. The clinical symptoms of children's reading performance were assessed by Dyslexia Checklist for Chinese Children (DCCC) and Pupil Rating Scale Revised Screening for Learning Disabilities (PRS) which were completed by parent/guardian and header teacher respectively. Chinese language exam was used to screen children with poor reading capacity. Questionnaires about prenatal and perinatal factors were completed by parent or guardian. Among the 34,748 eligible participants, 1,200 (3.45%) were diagnosed with dyslexia in Chinese. More boys suffered from dyslexia than the girls and the gender ratio was 3:1. Family history of neuropsychiatric diseases, maternal infectious diseases, difficult vaginal delivery, preterm birth, and neonatal asphyxia were found to increase the risk of developmental dyslexia in China. Closer longitudinal developmental monitoring and preventive measures should be taken for high risk children.

**Rosalyn A. Rubin, AT, EL [02]** Developmental dyslexia is a disorder in children with normal intelligence and sensory abilities who show specific reading difficulties in accurate and/or fluent word recognition, spelling, and decoding abilities across different languages<sup>1</sup>. Children who suffer from dyslexia have more depressive moods, anxiety symptoms, somatic complaints, and behavioural problems than their peers who are normal readers<sup>2</sup>. A majority of children with dyslexia have persistent disorders in reading, which therefore impairs education attainment and income in adulthood<sup>6</sup>.

This report describes the main clinical features associated with specific reading disability (RD) in a group of 778 school-age children studied in a Neuropsychological Clinic in Mexico City. The study was performed retrospectively, using data abstracted from clinical records of subjects seen in 1995-1996. Children were mainly from low and middle economic strata and aged between 6 to 12 years. The following data were collected: age, gender, diagnosis, school grade, food intake, maternal complications during pregnancy, perinatal and postnatal neurological risk factors, and neurological signs and handedness. Subjects with RD had a mean age of 102.9

Months, were predominantly male (male female ratio, 2:1). Among the study group, 49.1% of the children were diagnosed with RD of a visuo-sensory-motor type, and 75.1% were from early school years (1st to 3rd grades); 27.6% showed evidence of malnutrition. A previous history of language disorders (49.2%), and a high frequency of perinatal risk factors and neurological soft signs were also found. This study shows that variables

such as gender, food intake, and genetic and neurological risk factors, were associated with reading disabilities in school children.

**BRUCE BALOW , AT, EL [02]** For more than a century there has been speculation that the antecedents of mental retardation, learning disabilities, personality disorders, and similar educational and behavioral problems may be associated with anomalies of pregnancy, birth, and infancy. While most of the substantive research in this area has taken place during the past 25 years, its antecedents can be directly traced to the late 19th century. Systematic observation appears to have begun in 1862 with Little, who maintained that birth difficulties—specifically asphyxia, prematurity, and abnormal labor—were directly related to mental deficiency and cerebral palsy.

**M Veena Kumari, Sayid M Barkiya, AT, EL [04]** : Out of the 300 students with poor school performance, parental perception of learning problems was seen in 106 students. Post assessment 39 (13%) students had learning disability. Association was found between low birth weight, preterm birth, language, social and motor developmental delay. Association was also found between learning disability and attention deficit hyperactivity disorder.

**Xiaohui Zhang, and Ranran Song, , AT, EL [05]** A person with Intellectual Disability (ID) is one who demonstrates significantly low intellectual functioning or reasoning capability, which is below that of the average person of the same chronological age (peers) and also lacks skills in adaptive behaviour around everyday living tasks (i.e. independence with daily living, bathing brushing the teeth, buttoning a shirt, tying a shoe-lace, etc). Like other types of disabilities, intellectual disability has different degrees/levels. These degrees provide a good indication of how much assistance students will need to reach their maximum potential. The table below presents a picture of the levels ID takes in terms of approximate mental age that an individual will reach as an adult. An average child of 4, 5 or 6 years old should be able to speak intelligibly, and should also be able to do the above activities without the assistance from an adult person. However, when that is not the case, and for instance an adult who has the intellectual abilities and adaptive behaviour skills of a ten (10) year old would be thought and considered to have a mild intellectual disability (ID).

### IV. MATERIAL AND METHOD

A gross assessment of intellectual ability and the individual factor is learning disability. Learning disability is related to problems of acquisition and development of brain function involved in learning such as dyslexia, dyscalculia, and writing disorder. Without recognition and help children with a learning disability become increasingly frustrated and visual motor skills were done using "Good enough Harris draw a man test."<sup>1</sup> A general physical examination was carried out with a notice on dysmorphic features and

neurocutaneous markers. Neurological examination was done to look for fine motor abnormalities and soft neurological signs. The audiometric and ophthalmic examination was done to rule out hearing and visual deficits. For school based assessment, Snellen's six-meter test was used for vision. For hearing Rinne and Weber test was done. Assessment of reading, writing, and maths was done by informal method.<sup>2</sup>

**Learning disability (SLD)** is a developmental disorder, manifesting as difficulty in reading, writing, comprehending or using language, calculations, wherein the child has normal intelligence and conventional schooling, adequate motivation and opportunity, and intact hearing and visual capacity.<sup>1-4</sup> The child may also have ineffective information processing, thereby affecting his prioritizing and organizing abilities.

About 5-15% of school-going children have this disability.<sup>2</sup> Dyslexia is the most common and most studied one, affecting 80% of all those identified as. The study group included children in the age group of 8-12 years studying in third to seventh grade.

**Learning-disabled.** There are significant gender differences: boys are more often affected in developmental dyslexia than girls (4:1). However, in developmental dyscalculia and language difficulties, there are no noticeable differences.<sup>5</sup> Considering Indian scenario, information about SLD is sparse. The incidence of dyslexia in Indian primary school children has been reported to be 2-18%, dysgraphia 14%, and dyscalculia 5.5%. However, its awareness as a significant cause of academic underachievement has recently increased.<sup>6</sup>

Various factors are implicated in understanding SLD. Social variables like socioeconomic stress and maternal education have links with school performance.<sup>7,8</sup> Genetic basis of dyslexia has also been identified.<sup>9</sup> Various perinatal factors, like low birth weight (LBW) and prenatal stress can indirectly affect attention, leading to attention deficit hyperactivity disorder (ADHD), a common comorbidity with SLD.<sup>10,11</sup>

Co-morbidity in SLD is more of a rule than an exception. Dyslexia is common in ADHD and conduct disorders. Around 40 percent of children with ADHD also meet diagnostic criteria for dyslexia, and major link appears to be the inattention dimension. SLD is widely associated with affective disorders, particularly depression, deficits in social skills, self-esteem; peer relationship problems, feelings of lack of control and poor self-esteem.<sup>12</sup> Common behavioral signs of learning disabilities fall within two categories, internalizing and externalizing.<sup>4</sup> Students who internalize show behaviors that mostly affect themselves and are sometimes overlooked by others. Students with externalizing behaviors have a more obvious effect on those around them and are usually recognized earlier as having problems. Both these groups are at-risk for being seen as being problems rather than having problems.<sup>11,13</sup>

Karande et al found that about 40 percent of the sample of Indian children with SLD had developed aggressive or withdrawn behavior,<sup>14</sup> for which, identified reason was lack of awareness about the disorder.<sup>15</sup> Their referral is often made for reasons other than academic, and that too after a substantial delay in identification of the symptoms.<sup>16</sup>

The increasing focus on child mental health in developing countries like India points to the importance of epidemiological research in developing training, service and research paradigms. As there is need of more identifiable data, we planned to study the overall pattern of risk factors, co-morbidities and referral patterns of children with SLD. Also, high co-occurrence of ADHD, led us comparing certain parameters between those having SLD with and without ADHD.

It seen in this clinic were assessed by two psychiatrists for the learning problems, as well as for any other comorbidities - physical or psychiatric. Parents and the child, both were interviewed. Children were screened for hearing and visual impairments. Thereafter, they were seen by a faculty from Developmental Pediatrics for any neurological issues, which can play a role in child's scholastic performance. Trained and certified psychologists evaluated for learning difficulties, using batteries like Woodcock Johnson. In particular cases, occupational therapy assessment was also performed to look for hyperactivity, incoordination or sensory abnormalities.

A child diagnosed with any comorbid psychiatric illness was first treated for the same, and then evaluated after being stabilized. Finally the diagnosis would be made with consensus of the mentioned professionals of the team. All the assessments are compiled and a meticulous yearly record of all these has been maintained right after the establishment of this LD clinic.

In our study, children diagnosed having SLD in past 5 years, were included, total being 2015. A semi-structured proforma was constructed (based on the information in the records of the LD clinic) which consisted of demographic details, perinatal events, referral pattern and co-morbidities of included children frequency computation was done.

#### **STATISTICAL ANALYSIS BY SPSS SIMULATION TOOL.**

Table 1 shows demographic details of the sample. Out of the total studied 2015 case records, 73.35% were males; male to female ratio being 2.75:1. Mean age was 12.9 years and 87.99% were right handed. 67.14% were from state board schools and had English as their medium for instructions (94.19%).

Percentage of school drop - outs (2.13%) and also of those who had changed their schools for various academic reasons was quite low. Considering the diagnosis, 87.94% had all three disabilities-dyslexia

Table 1: Demographic profile of the children Having SLD.

Male	1478 (73.35)
Female	537 (26.65)
Handedness n (%)	
Right	1773 (87.99)
Left	199 (9.87)
Mixed	43 (2.13)
Medium of instruction n (%)	
English	1898 (94.19)
Marathi	87 (4.32)
Hindi	26 (1.29)
Others	4 (0.19)

**RISK FACTOR PROFILE**

There were 25 adopted children in this study, for whom antenatal or birth related details were not available. Considering the perinatal factors of the rest, psychological stress to mother was present during pregnancy in 10.17% of the study group, as elicited on history. Delivery of the child was normal in 72.04% and the rest were Caesarean section or assisted. 9.48% of the mothers of these children suffered from antenatal complications, commonest being pregnancy-induced hypertension (3.17%), followed by fever, bleeding per vagina and gestational diabetes mellitus. Pregnancy was preterm in 6.5%, post term in 1.84% and term in the rest. 14.54% children had post-natal complications, the commonest being jaundice in 10.14%, followed by hypoxia and seizures. It was found that 4.81% of the children did not cry immediately after birth and 11.11% had low birth weight (LBW). Speech milestones were delayed in 15.38%; 65% had delayed motor development and 6.94% children had speech deficits like stammering. Table 2 shows certain visuo-spatial and fine motor deficits in these children.

Table 2: Some associated deficits in the children having SLD.

Ability	N (%)
Fine motor issues	346 (17.17)
Right left confusion	100 (4.96)
Difficulty in telling time seeing the clock	754 (37.41)

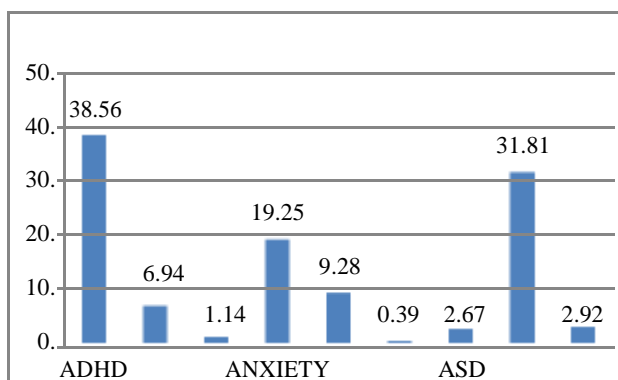


Figure 1: Co-morbidities in children having specific learning disorder (in %).

**Comparison between SLD and SLD with ADHD group**

As ADHD was found in such a high number, two groups were seen emerging, i.e., SLD with and without ADHD. The SLD with ADHD group had 81.47% male as against 68.17% in pure SLD one; male to female ratio being 4.39:1 and 2.14:1 in the two groups respectively. Handedness and average IQ (both verbal and performance) were nearly similar (Table 3). Number of school drop - outs was 29 (2.34%) in the SLD without ADHD and 14 (1.80%) in the other group.

Table 3: Intelligence quotient in children having LD with and without ADHD.

	SLD N (%)	SLD with ADHD N (%)
Average VQ	99.47	99.62
Average PQ	107.13	106.54

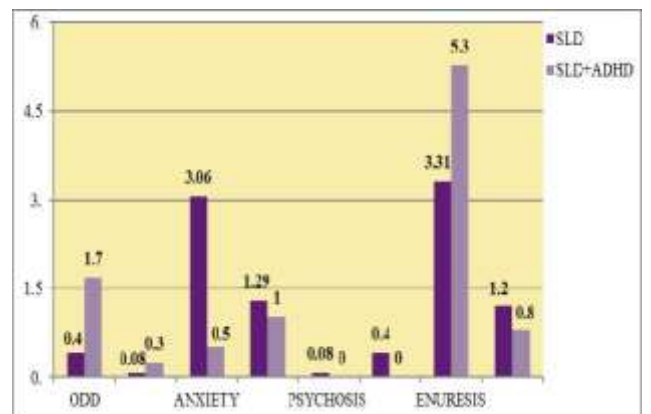


Figure 3: Co-morbidities in children having SLD with and without ADHD (IN %).

**V. DISCUSSION**

In this study, male to female ratio was 2.75:1. Earlier studies have found SLD occurring more in boys, but recent ones found no difference.<sup>4,17</sup> Higher number of males has been considered to be the result of referral bias by various authors.<sup>14,18</sup> Handedness was nearly similar to what exists in general population.<sup>19</sup>

2.13% of them were school dropouts. Zigmond et al in his study found 50% of the youth with learning disabilities (in comparison to 33% of their peer group) had left school before graduation.<sup>20</sup> 30.3% of the students in our study had changed their schools at least once because of not being able to cope or failing in class, as stated by other studies as well.<sup>21</sup> Mean IQ here, was nearly similar to previous studies, including those in Indian children.<sup>12,14,22</sup>

Majority students (87.94%) in our study had all three disabilities- dyslexia, dysgraphia and dyscalculia. Karande et al found 58% children had the three diagnoses with co-occurring ADHD.<sup>14</sup> In our study, 16.28% also had associated language barrier. In India, most of the children are bilingual and first generation English learners; hence possibility of language barrier is very strong, as in any other country where second language is being taken up.<sup>23</sup>

In present study, 6.05% children had siblings with some academic issues and 3.77% had diagnosed SLD. Family studies indicate that around 50% of siblings of child with learning disability may have this disorder.<sup>4,12</sup>

On analyzing referral pattern of the children, mean age was found to be 12.9 years, which appears quite late when onset of the disorder per se is viewed. Earlier studies have found varied results.<sup>18,31</sup> In our study, the symptoms in most cases were noticed between 8-12 years of age, related to academic issues, and were referred by teachers or parents. This might be because of inclusion of the subject of SLD in the modified B. Ed (Bachelor of Education) curriculum. However, various reasons have been quoted for such referrals by other authors, including academic, behavioural, non academic, even medical ones or a combination of these.<sup>2,16,18</sup> Majority students were referred for either academic or both academic and behavioural reasons.<sup>14</sup> We noticed a significant delay in referral in many children, which shows lack of awareness about the disorder among parents, inadequately trained teachers for identifying and referring the child for assessment, waiting to the extent until the situation become unmanageable, lack of knowledge in health professionals and inadequate resources.

Children with SLD are known to have peer issues. They develop behavioural problems such as aggressive and withdrawn behaviours and inadequate communications because of lack of self-esteem and frustration due to poor scholastic performance.<sup>32</sup> According to Cheryl et al, these children had fewer peers for support, while dealing with an academic stressor or an interpersonal problem.<sup>23</sup>

Children with SLD are at increased risk for other psychiatric disorder, seen in both epidemiological and referred samples.<sup>33</sup> In particular ADHD, inattention type and conduct Disorder (CD) are found related to reading difficulties.<sup>34</sup> The degree of overlap between ADHD and dyslexia has been reported to be 35%.<sup>35</sup>

SLD is highly related to internalizing symptoms, like depression and anxiety. In this study, 19.25% of the children with SLD had anxiety and 9.28% had depression. According to Julia et al, in a similar group, boys were found having depressive symptoms, however girls were not; although anxiety mostly separation and generalized anxiety was closely associated with SLD.<sup>33</sup> However, another study found contradictory results.<sup>13</sup> The reason for such symptoms could be lack of sense of self-efficacy and motivation for homework, using learned helplessness and difficulties in social integration.<sup>32</sup>

During the course of the study, we found two groups emerging: SLD with and without ADHD. Comparing a few variables, we found that male to female ratio was 4.39:1 and 2.14:1 in the two groups respectively. Studies also suggest that the relation between ADHD and SLD is stronger for males than for females.<sup>33,36</sup> No considerable difference was found in handedness and IQ of the two

groups, which is against the findings of Jepsen et al that there is modest association between IQ and ADHD, with the mean influence on IQ probably amounting to two to five IQ points.<sup>37</sup> This was probably because the children who came for assessment of SLD in our hospital, if found to have ADHD, were initially treated for the same, and only after symptomatic control, were taken up for further SLD evaluation, including IQ, which suggests that improvement in ADHD symptoms can probably lead to better performance. Considering the development, delay in speech was more in children with co-morbid ADHD. Also, this group had higher fine motor issues, which is in accordance with the disorder of ADHD. Comparing co-morbidities, anxiety was found more in the SLD without ADHD children; and ODD, CD and enuresis more with co-existing ADHD, as stated by Willicut as well, suggesting that significant relation between SLD and CD is mediated by co-morbid ADHD.<sup>36</sup>

## VI. CONCLUSION

We found that majority of the children belonged to 8-12 years age group, were referred by teachers, mostly for academic issues and had all three disabilities-dyslexia, dysgraphia and dyscalculia. However, sizeable delay was seen between the onset of symptoms and seeking medical help. Antenatal complications, birth weight and maternal stress did not seem to stand out in these cases. Speech delay, fine motor issues and visuo-spatial deficits were found in a considerable number; more in the children having co-morbid ADHD. ADHD, Enuresis and anxiety were the most commonly found co-morbidities, although anxiety and depression were commonly associated with children having SLD without ADHD, and enuresis and conduct disorder with those having SLD with ADHD. Evaluating the data of 2015 cases, we can infer that improvement in such children would require a comprehensive approach- awareness programs for teachers and parents for early identification and intervention of learning issues and associated problem behavior. Media can play a very significant role in creating a clear and discrete understanding of the disorder in the community. However, this study was retrospective; a prospective and longitudinal research would lead to better results.

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- **QUESTIONNAIRE SET 1 2 3.**
- **SPSS ANALYSIS BY IBM TECHNIQUES.**

## QUESTIONNAIRE DETAILS:

**1. QUESTIONNAIRE TO MEASURE BEHAVIOURAL PROBLEMS IN children: Psychological Testing and meta-analysis.**

Introduction: The primary complaint amongst the BEHAVIOR PROBLEMS is fatigue or hyperactivity. This may be the result of processing problems which make it difficult for child to deal with social situations. This may result in various behaviour problems. Behavioural disorders can occur as a result of neurological, psychological and environmental factors.

Deviation in the behaviour in a significant manner from that expected for the situation. This inappropriate behaviour is consistently shown in different situations. This behaviour may be compulsive and/or impulsive, sad or withdrawn. Irritating, distractive, aggressive, self-injurious, maladjusted, hyperactive, rebellious and odd social behaviour. Other than that, the behaviour may represent poor interpersonal relationships. Whatever the factor responsible for such kind of behaviour, it gives an indication of something which deviates from the normal behaviour and is an alarming sign, and can be related to behaviour skills. Existence of behavioural problems and Attitude problems both creates a complicated situation to deal with. One has to make several attempts to find the right solution.

Dimensions of behavioural problems are:

1. Misbehaviour: Bad behaviour of a person which is not acceptable by the society.
  2. Distractive: Distraction of the attention of an individual or group from a desired area
  3. Irritating: Irritating behavior is person's annoying habits that bother everybody.
  4. Aggressive: Aggressive behaviour ranges from verbal abuse to physical abuse. It can also involve harming personal property.
  5. Self- injurious: Self-injurious behaviour is where a person physically harms themselves.e head banging on floors, walls or other surfaces, hair pulling, skin picking, scratching or pinching, forceful head shaking.
  6. Maladjusted: Not happy in social set up and failing to cope with the demands of a normal social environment.
  7. Social: Social behaviour is one in which one member affects the other. This is due to an interaction among those members.
  8. Hyperactive: Hyperactive behavior usually refers to continuous activity, being easily distracted, impulsiveness, inability to concentrate, aggressiveness.
  9. Rebellious: This includes behaviors such as disrespect, being sneaky, manipulating the rules you've created for your household, having negative attitudes.
  - 10...Odd behaviour: ODD behaviour of children displays angry and irritable moods, as well as argumentative and vindictive behaviors.
- So, a questionnaire has been made to measure the behavioural problems of children.

**2. QUESTION NAIRE SET 2**

**Awareness of testing for learning skills.**

**Introduction:** A human birth is the beautiful creation of the god. As a human grows, he/she starts exploring his environment. With the age, he starts learning languages

spoken by the people around him. When the child is unable to learn according to his age and lag behind is the initiation of learning knowledge. Technically Learning complex is a problem caused due to dysfunctioning of the brain, sometimes it is genetic and sometimes it is caused due to organic or biological factors. Poor Home Environment and inappropriate School learning leads to poor learning capacity. Reasons can be many but person with **Learning skills** needs help and can be improved. **Learning skills** of the human at initial stage is identified by the mother at home and by the teacher in school. Presence of learning knowledge is reflected in different forms.

**Operational definition: Awareness is the state of being knowlegeable. It is also the ability to perceive, feel, know, or be conscious of events.**

To know the awareness of learning skills and writing skills or. A questionnaire is developed to gather information from children to know their awareness about the learning knowledge skills.

**TOOL - I**  
**QUESTIONNAIRE**

**Name:**

.....  
 .....Age.....Male/Female.....  
**Designation.....Subject.....**  
 .....Education.....Married/Unmarried...  
 .....Income (in Thousands) 10-20 ( ) 21-30 ( ) 31-40 ( ) 41-50 ( ) Above 50 ( )...

- Which one of the following options are true-

**3. SCREENING QUESTIONNAIRE SET 3**

Introduction: The term 'Learning skills' refers to ability in learning and such kind of disability is specific learning disorder which is related to sensation and perception of the **CHILDREN** with such problems show their disability in reading, writing, speaking, understanding, and in mathematical calculations. Learning is a ability which is related to learning process. A questionnaire has been made to know the problems in different areas like reading, writing, mathematics, receptive language, expressive language, attention and concentration, memory, graphics, motor skills, visio-spatial and organization. A tool has been developed by the researcher to screen the of the **CHILDREN** by assessing different aspects of screening test.

**Operational definition: "CHILDREN, who fail to attain the language skills of reading, writing and spelling even after getting normal interview experience in proportion to their intellectual abilities.**

Following are the dimensions to be assessed:

1. Reading: Reading" is the process of getting meaning from the written alphabets to receive information. Skill of reading should have the support of the skill of speaking, so that it helps in pronouncing the words that we read.



2. Writing: Writing" is using symbols like letters of the alphabet, punctuation and spaces to communicate ideas in a readable form.
3. Mathematics: Mathematics is the science that deals with the logic of shape, quantity and arrangement.
4. Receptive language: Receptive language means the ability of understanding the words, sentences and meaning of what others say or what is read.
5. Expressive language: Expressive language is the way to give meaning to thoughts by putting them in group of words or sentences.
6. Attention and Concentration: Attention is when you are mentally active to learn the things whereas Concentration means your mind is mentally prepared to adopt the thing.
7. Memory: Memory is the ability of mind to is encode, store, and retrieve the data or information when needed. In such a way information is retained in the mind.
8. Graphics: A graphic is an image or visual representation of an object.
9. Motor skills: Motor skills are helpful in making coordination of body.
10. Visio-spatial: CHILDREN use visual-spatial processing skills to read maps, follow dance moves and solve some math problems supported by processing skills.

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