Systematic Review to Determine the Incidence of Psychiatric Co-morbidities in Learning Disabled Children

Systematic Review
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Huda Abd El-Razek Mohamed

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List of Abbreviations

ADHD	:	Attention Deficit/ Hyperactivity Disorder
AIDS	:	Acquired Immune Deficiency Syndrome
APA	:	American Psychiatric Association
ASD	:	Autism Spectrum Disorder
CBCL	:	Child Behavior Check List
CD	:	Conduct Disorder
CDI	:	Children's Depression Inventory
CLDRC	:	Colorado Learning Disabilities Research Center
DBDs	:	Disruptive behavioral disorders
DISC	:	Diagnostic Interview Schedule for Children, version IV
DMDD	:	Disruptive Mood Dysregulation disorder
DPCL	:	Developmental psychopathology checklist for children
DSM	:	Diagnostic and Statistical Manual of Mental Disorders
DTI	:	Diffusion tensor imaging
FA	:	Fractional anisotropy
GORT	:	Gray Oral Reading Test
HIV	:	Human Immunodeficiency Virus
ICD	:	International Classification of Disease
IDEA	:	Individuals with Disabilities Education Act
IQ	:	Intelligence quotient
K-SADS	:	Kiddies Schedule for Affective Disorders and Schizophrenia for School-Age Children - Present and Lifetime Version
LD	:	Learning disability
LD NOS	:	Learning Disorders Not Otherwise Specified
MD	:	Mathematics disorder

List of Abbreviations(Cont.)

MINI Kid	:	Mini International Neuropsychiatric Interview Kid
MRI	:	Magnetic Resonance Imaging
NSCH	:	National Survey of Children's Health
ODD	:	Oppositional Defiant Disorder
RD	:	Reading disorder
SCAS	:	Spence Children's Anxiety Scale
SD	:	Standard deviations
SLD	:	Specific Learning Disorder
SLI	:	Specific Language Impairment

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Introduction

Learning disability is a generic term that refers to a heterogenous group of disorders manifested by significant difficulties in the acquisition and use of reading (dyslexia),writing (dysgraphia), or mathematical (dyscalculia) abilities despite intact senses, normal intelligence, proper motivation, and adequate sociocultural opportunity **(*Felder et al., 2008*).** From a diagnostic point of view, the discrepancy between the achieved level of academic performance and the age expected for the level, within a normal intelligence range, is a sufficient criterion to identify the learning disability ***(Fletcher et al., 1994).***

Many studies reported that children with specific developmental disorders of scholastic skills had co-morbid psychiatric disorders ***(Bandla et al., 2017; Sahoo et al., 2015).*** Moreover, there is a strong relationship between inattentiveness and reading disabilities **(*Rowe and Rowe, 1992).***

Recently, studies indicated that LD is associated with behavioral and emotional problems in up to 30% of cases ***(Sahoo et al., 2015),*** and the pattern of deficits vary across the individuals affecting the child's academic performance further. While other studies reported that 21 out of 56 children with specific developmental disorders of scholastic skills had a co-morbid psychological disorder***(Kishore et al., 2000)***.

Psychiatric comorbidities in learning disabled children are subdivided into externalizing and internalizing disorders. Externalizing disorders are as conduct disorder, attention deficit hyperactivity and oppositional defiant disorders, and the internalizing disorders are as depressive and anxiety disorders ***(Achenbach andRescorla, 2001).***

Regards the externalizing disorders, the most common comorbidities include attention deficit hyperactivity disorder (ADHD). Reported rates of co-morbid ADHD in learning disabled children vary from about 10% to as high as 60% depending on the specific sample examined ***(Karande et al., 2007).***

LD and ADHD may co-occur in the same unfortunate child because of a shared genetic etiology. About 20% of children with LD have associated ADHD as comorbidity and vice versa. Some researchers believe that each of these disorders has an independent etiology, while others believe that their frequent co-occurrence is the result of a generalized atypical brain development ***(Karande et al., 2007).***

The first epidemiological studies done on learning disabled children, reported that conduct disorders was present five times more often in children with LD, being mediated by the simultaneous presence of ADHD, and/or to be influenced in the co-occurrence of this association by family-related factors ***(Maughan et al., 1996).***

Although the literature reported few data concerning the association between LD and internalizing disorders, the latest studies have found a greater incidence of internalizing

symptoms, assessed through the Child Behavior Check List (CBCL) ***(Boetsch et al., 1996)***, and of depressive symptoms, assessed through the Children's Depression Inventory (CDI) ***(Willcutt and Pennington, 2000a).***

It is important to understand and to detect the prevalence of existence of psychiatric comorbidities with learning-disabled children as the presence of any additional disorder may affect the expression and severity of the clinical picture of LD **(*Margari et al., 2013).*** Moreover, learning-disabled children with psychiatric comorbidities such as ADHD or any other emotional problems need a special clinical and educational attention together with requiring specific rehabilitation programs and interventional plans **(*Beitchman and Young, 1997).***

Learning Disability

Definition of Learning Disability

Learning disability (LD) is defined by ***(Felder et al., 2008)*** asa heterogenous group of disorders manifested by significant difficulties in the acquisition and use of reading (dyslexia), writing (dysgraphia), or mathematical (dyscalculia) abilities despite intact senses, normal intelligence, proper motivation, and adequate sociocultural opportunity.

Recently, the latest edition of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders – "DSM-V" ***(American Psychiatric Association, 2013)*** broadened the diagnostic categoryof learning disabilityby using the generic term ''Specific Learning Disorder'' (SLD). SLD as an overall diagnosis is defined as a disorder that is incorporating difficulties in learning academic skills, such as reading, writing, and mathematics, which have been classified as separate disorders previously.

Moreover, from the diagnostic point of view, the discrepancy between the achieved level of academic performance and the age expected for the level, within a normal intelligence range, is enough criterions to identify the learning disability ***(Taylor et al., 2017).***

Classification of Learning Disability

There were many studies concerned about classification and subtypes of learning disability, each one of

them discussed learning disability from a different point of view ***(Little, 1999; Supple, 2000; National Dissemination Center for Children with Disabilities, 2004).***

The one by ***Little (1999)*** was one of the classifications that broadly classified LD into 3 main subtypes:

1- Language-based learning disabilities.
2- Non-verbal learning disability (also called "right-hemisphere learning disorders").
3- Learning disabilities that affect executive functions.

1- Language-based learning disabilities:

These include any disabilities that affect language including problems in reading, spelling and written compositions. They are due to auditory-verbal processing difficulties. Broadly, reading disorders fall into two types: disorders of decoding and word identification at the word level (dyslexia) and disorders of reading comprehension that affectboth single words and text comprehension.

2- Non-verbal learning disabilities:

It includesa cluster of neuropsychological, academic, and social-emotional characteristics that reflects primary deficiencies in non-verbal reasoning. They are due to visual, perceptual and motor processing difficulties.

3- Learning disabilities that affect executive functions:

Executive Functions include:

- **Organization** (attention, decision-making, planning, sequencing, problem solving).

- **Regulation (**initiation of action, self-control, and self-regulation).
- **Working memory *(Kuhn et al., 2017).***

From the Phoniatric point of view, ***Supple (2000)*** categorized language-based learning disabilities into:

(1) **Lower order process disorders**: including phonological awareness deficits and sound production deficits.

(2) **Higher order process disorders**: including vocabulary deficit (including word finding difficulty), semantic deficit and syntactic deficit.

LD Classification by the National Dissemination Center for Children with Disabilities (2004):

Learning disability can also be categorized by the ***National Dissemination Center for Children with Disabilities (2004)*** according to the type of information processing that is affected into:

A) Information processing deficits.

B) Specific learning disabilities.

A) Information processing deficits:

The types of LD are identified by the specific processing problem. They might relate to getting information into the brain (Input), making sense of this information (Organization), storing for later retrieving this information (Memory), or getting this information back out (Output). Thus, the information processing deficits that result in LD might be in one or more of these four areas:

I- Disabilities at the input stage:

As information is primarily brought into the brain through the eyes (visual perception) and ears (auditory perception), an individual might have difficulty in one or both areas.

1- Visual Perceptual Disabilities.
2- Auditory Perceptual Disabilities.
   Disabilities with input from the other senses may also appear in some children who unable to understand tactile/touch input.
3- Sensory Integrative Disorders.

   While social perceptual disabilities cause misperception of social cues and body language and misinterpretation of gestures, facial expressions, and tone of voice
4- Social Perceptual Disabilities.

II- Disabilities at the integration stage:

Once information is recorded in the brain (input), three tasks must be carried out in order to make sense or integrate this information. First, the information must be placed in the right order or sequenced. Then, the information must be understood beyond the literal meaning, abstraction. Finally, each unit of information must be integrated into complete thoughts or concepts, organization. So, an individual may have one or more of the following deficits:

1- Sequencing Disabilities.
2- Abstraction Disabilities.
3- Organizational Disabilities.

III- Disabilities at the storage stage:

Problems with memory can occur with short-term or working memory, or with long-term memory. Most memory difficulties occur in short-term memory, which can make it difficult to learn new material without many more repetitions than is usual. "Short-term memory" is the active process of storing and retaining information for a limited period. The information is temporarily available but not yet stored for long-term retention. "Long-term memory" refers to information that has been stored and that is available over a long period of time. Individuals might have difficulty with auditory memory or visual memory. "Working memory" refers to a processing resource of limited capacity, involved in the preservation of information while simultaneously processing the same or other information. Deficits in working memory are so frequently associated with executive function disorders.

IV- Disabilities at the output stage:

Information is communicated by means of words (language output) or though muscle activity such as writing, drawing, gesturing (motor output). An individual might have:

1- Language disabilities(also called expressive language disability), and/or

2- Motor disabilities.

B) Specific learning disabilities:

Specific learning disability is a group of neuro-developmental disorders which manifests in childhood as