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Behavioral and emotional functioning of children with specific learning disorders

Asarnisa Begum M[1], Kandasamy V[2]

[1]Consultant, Department of Psychiatry, Aram Hospital, Trichy, [2]Assistant Professor, Department of Psychiatry, Tirunelveli Medical College Hospital, Tirunelveli, Tamil Nadu, India

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ABSTRACT

Background: Specific learning disorder (SLD) is distinct from other Diagnostic and Statistical Manual (DSM)-5 mental disorders as it is recognized clinically in medicine and as a separate category in special education. **Aims and Objectives:** The study aimed to study the behavioral patterns and emotional functioning in children with SLD. **Materials and Methods:** This observational cross-sectional study was conducted at Tirunelveli Medical College, Tirunelveli, from January 2019 to April 2020 on 100 patients (study group 50 and control group 50) diagnosed with SLDs as per DSM5 criteria. A patient's history includes age, gender, symptoms, and diagnosis. Assessments were done through a semi-structured proforma, Rutter Children's Behavior Questionnaire (parent form), the Vanderbilt attention deficit hyperactivity disorder (ADHD) diagnostic rating scale, and the Rosenberg self-esteem scale (RSES). **Results:** The patient's domicile in rural areas was 82% compared to urban areas, which is 18%. The Rutter scale – total score was higher in the study group, with a mean of 3.24, compared to the control group, with a mean of 0.44. The RSES compared self-esteem scores and the mean self-esteem scores of 21.56 and 14.72, respectively ($P<0.0001$). The deviant/antisocial behavior subscale scores were higher for the study group, with a mean score of 1.08, than the control group, with a mean score of 0.02 (<0.05). The ADHD (inattentive type) Vanderbilt scale was compared, and it was found to be positive for the study group and none for the control group ($P=0.022$). **Conclusion:** The scores show a significant correlation between higher rates of neurotic behavior and behavioral problems, predominantly inattentive types, in SLD children.

Key words: Specific learning disorder; DSM-5 criteria; Rutter's score; Vanderbilt ADHD rating scale; Rosenberg self-esteem scale; Neurotic behavior

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INTRODUCTION

Specific learning disorder (SLD) is defined as a heterogeneous group of conditions where there are deficits in processing spoken or written language, which can manifest as difficulty in reading, writing, speaking, spelling, comprehending, or doing arithmetic calculations; it includes dyslexia, dyscalculia, dysgraphia, dyspraxia, and developmental aphasia, and it is usually not recognized until the child starts going to school. Also, many of those children exhibit signs only when they start engaging in tasks that require a certain level of cognitive processing.[1,2] Also, 30% of children with a learning disability were found to have emotional and behavioral problems such as attention deficit hyperactivity disorder (ADHD), anxiety, depression, suicide, and substance abuse, which adds a burden to the academic difficulty despite their disproportionately better intellectual capacity.[3] Thus, the behavioral and emotional functioning of children with SLD is a very important area to be explored, as it will impact the mental health of our future younger generation. SLD with reading difficulty (mostly at the word level) is the most common and well-studied manifestation, affecting at least 90% of individuals diagnosed with SLD.

SLD, according to the Diagnostic and Statistical Manual (DSM)-5, is a neuro-developmental disorder that presents with marked and persistent difficulty in learning and

Address for Correspondence:
Dr. Asarnisa Begum M, Consultant, Department of Psychiatry, Aram Hospital, Trichy, Tamil Nadu, India. **Mobile:** +91-86750 39761.
E-mail: nishamoideen94@gmail.com

using one's cultural symbol systems (numerals, letters, and characters) required for skilled writing, reading, and arithmetic. These disorders are heritable, have an early onset, persist throughout life, and impair academic, occupational, social, and mental health outcomes.[4] In the educational field, the term learning disability refers to a specific category of special learning needs that requires the mandatory provision of special education or other services to help children get more equitable access to their curriculum and to promote their learning.[5]

DSM-5 diagnostic criteria for SLDs: Inaccurate or slow and effortful word reading (e.g., difficulty sounding words, frequently guesses words, reads single words out incorrectly or slowly and hesitantly), difficulty in understanding the meaning of what is read (e.g., can read the text accurately but cannot understand the sequence, inferences, relationships, or the deeper meaning of what is read), difficulty with spelling (e.g., may omit, add, or substitute vowels or consonants), difficulty with written expression (e.g., written expression of ideas lack clarity, employs poor paragraph organization, make multiple grammatical or punctuation errors within sentences), difficulty mastering number sense, number facts or calculation (e.g., counts on fingers to add single digit numbers instead of recalling the fact, poor understanding of numbers, their magnitude and relationships, gets lost in the midst of arithmetic computation), and difficulty with mathematical reasoning (e.g., difficulty in applying mathematical concepts, facts, or procedures to solve quantitative problems).[6]

Emotional development in SLD: A considerable difference is found in children's motivational and behavioral profiles with SLD and their normal peers. Social, emotional, and mental health problems often manifest concurrently with SLD. Severe anxiety and anxiety disorders are also common during the lifespan of SLD individuals. Also, individuals with SLD have a risk for suicidal ideations and attempts during childhood, adolescence, or adulthood.[7]

Attention deficit/hyperactivity disorder: About 20–45% of children with SLD are found to meet the criteria for ADHD as well. SLD in reading and writing was strongly associated with the inattentive type of ADHD. Thus, the behavioral and emotional problems in SLD children result in negative outcomes during school and the early adult years, resulting in less-than-optimal employment outcomes, more and more legal troubles, and unsatisfactory personal and social lives.[8] Hence, the study aimed to study the behavioral patterns and emotional functioning in children with SLDs.

Aim of the study

To study the behavioral patterns and emotional functioning in children with Specific Learning Disorder.

Objectives

To study the behavioral patterns in children with specific learning disorder.

To assess whether there is any abnormal behavioral patterns or behavioral abnormalities in children with specific learning disorder.

To study the emotional functioning of these children by assessing their self-esteem levels.

To determine whether there is any difference in the behavioral patterns and emotional functioning of SLD children with that of normal children of similar age group.

MATERIALS AND METHODS

This observational cross-sectional study was conducted at Tirunelveli Medical College, Tirunelveli, from January 2019 to April 2020 on 100 patients (study group 50 and control group 50) diagnosed with SLDs as per DSM5 criteria. All the patients and their relatives were explained about the study design at the time of enrollment, and detailed consent regarding their willingness to participate was obtained. Ethical committee approval was obtained before the study started.

Inclusion criteria

For the study group – aged 8–16 years, male and female gender, diagnosed as SLD based on the DSM5 criteria.

For the control group – aged 8–16 years, male and female gender, children attending the pediatric outpatient clinic for minor physical ailments.

Exclusion criteria

For the control group (age <8 years and >16 years), children with major physical illness, with a diagnosis of a major psychiatric disorder, and children of parents who were not willing to consent to the study were excluded from the study.

After obtaining informed consent from the parents of the children who are the participants of the study, as required by the Institutional Ethical Committee, interviews and assessments were done in the hospital at outpatient clinics of the psychiatric and pediatric departments. The children were interviewed using semi-structured proforma. The behavioral patterns of children were assessed using Rutter's child behavior questionnaire (parent form) and the Vanderbilt ADHD Rating Scale (parent form). The children's self-esteem was measured using the Rosenberg self-esteem scale (RSES) in the study and control groups.

Statistical analysis

The statistical analysis used a Statistical Package for the Social Sciences. Data entry was done in MS Excel.

Qualitative data were in frequencies with their percentages. Quantitative data were given in mean and standard deviation using the Chi-square test, independent sample t-test, and Mann–Whitney U-test, and Pearson correlation coefficient was applied to find any correlation between behavior and emotional problems in the study and control groups.

RESULTS

Among 50 patients in the study group and 50 in the control group, the mean ages were 12.06 and 11.84, with a standard deviation of 2.43 and 2.48, respectively, and a P=0.655. 56% of males were predominant over 44% of females in the study group, but this is not statistically significant (P=0.548) (Table 1).

82% of domicile cases are from rural areas compared to urban areas, which were 18%, and the p-value was found to be 0.235, not statistically significant. The history of pre-term delivery is seen in 8% of cases and 6% of controls, with a P=0.695.

A history of birth trauma is seen in 4% of cases and 2% of controls. A history of developmental delay is seen in 8% of the study group and 4% of the control group, 16% of the study group, and 12% of the control group have a family history of mental illness, and the P-values were found to be 0.558, 0.4, and 0.564, respectively. There is no statistically significant correlation between history of pre-term delivery, history of birth trauma, history of neonatal complications, history of development delay, and family history of mental illness between the groups (Table 2).

In the RSES, the study group (SLD) has a mean self-esteem score of 21.56 with a standard deviation of 4.56, and the controls have a mean self-esteem score of 14.72 with a standard deviation of 3.88. A statistically significant correlation (P<0.0001) exists between the self-esteem scores.

On the Rutter scale, the study group has a mean score of 3.24 with a standard deviation of 5.39. The control group has a mean score of 0.44 with a standard deviation of 1.55 and a statistically significant correlation (P=0.001).

In the neurotic behavior subscale score of Rutter's scale, cases have a mean score of 0.76 with a standard deviation of 1.85. In contrast, controls have a mean score of 0.12 with a standard deviation of 0.72 and a P=0.023, indicating a statistically significant correlation between the neurotic behavior subscale score in the study population.

In the deviant/antisocial behavior subscale, cases have a mean score of 1.08 with an SD of 0.14 and the controls have a mean score of 0.02 with an SD of 0.14 and no statistically significant correlation (P=0.24). The study group scored a higher mean value in the behavior problem subscale with a statistically significant correlation (P=0.007) (Table 3).

ADHD (predominantly hyperactive type) is screened using the Vanderbilt ADHD Diagnostic Rating Scale (VADRS) scale. One from the study group and one from the control group screened positive for ADHD (hyperactive type). There is no statistically significant correlation between ADHD (hyperactive type) and SLD.

Five from the study group and none from the control group screened positive. A statistically significant correlation (P=0.022) is found between ADHD (inattentive type) and SLD.

Table 1: Demographic data of the study

Patient characteristics	Control	Case	P-value
Age	11.84±2.48	12.06±2.43	0.655
Gender			
Male	25 (50%)	28 (56%)	0.548
Female	25 (50%)	22 (44%)	

Table 2: Comparison of birth trauma, developmental delay, and mental illness between the groups

Variables	Control	Case	P value
History of pre-term delivery			
Present	3	4	0.695
Absent	47	46	
History of birth trauma			
Present	1	2	0.558
Absent	49	48	
History of neonatal complications			
Present	1	3	0.307
Absent	49	47	
History of development delay			
Present	2	4	0.4
Absent	48	46	
Family history of mental illness			
Present	6	8	0.564
Absent	44	42	

Table 3: Comparison of self-esteem scores, Rutter scale-total score values, and deviant/antisocial behavior between the groups

Group	Control	Case	P-value
Total score Rosenberg self-esteem scale	21.56±4.56	14.72±3.88	<0.0001
Total score-Rutter scale	0.44±1.55	3.24±5.39	0.001
Neurotic behavior Rutter scale	0.12±0.72	0.76±1.85	0.023
Deviant behavior Rutter scale	0.02±0.14	1.08±2.26	0.24
Behavioral problems Rutter scale	0.30±1.36	1.40±2.63	0.007

Table 4: Comparison of ADHD (hyperactive, inattentive, and mixed types) screening between the groups

Variables	Control	Case	P-value
ADHD (hyperactive type) Vanderbilt scale			
Negative	49	49	1
Positive	1	1	
ADHD (inattentive type) Vanderbilt scale			
Negative	50	45	0.022
Positive	0	5	
ADHD (mixed type) Vanderbilt scale			
Negative	49	50	0.315
Positive	1	0	

ADHD: Attention deficit hyperactivity disorder

None from the study group and one from the control group screened positive for ADHD (mixed type). No statistically significant correlation exists between ADHD (mixed type) and the study population (Table 4).

A comparison of oppositional deviant disorder screening shows none from the study, and the control groups screened positive. One from the study group and none from the control group screened positive for CD. There is no statistically significant correlation in the CD screening between the study groups.

Anxiety/depression screening using the VADRS scale showed that two from the study group and none from the control group screened positive, and there is no statistically significant correlation noted in anxiety/depression screening between the study groups.

DISCUSSION

SLD is one of the most commonly diagnosed neurodevelopmental disorders. The lifetime prevalence of SLD from a recent epidemiological study was found to be around 10%. SLD is often linked to motor skills, speech, language, and attention challenges. It frequently co-occurs with neurodevelopmental conditions such as communication disorders and ADHD and mental disorders such as anxiety and mood disorders. Identifying early communication disorders can serve as a risk indicator for later SLD, while the formal diagnosis of SLD typically requires the child's exposure to formal education in school.[9]

In our study, the maximum incidence was in the same age group of 11–12 years, and the total number of cases and controls chosen was 50 each. Among these, 53% of males and 47% of females were represented. Our study compares the history of pre-term delivery, birth trauma, neonatal complications, and developmental delay between the cases and the controls. No statistically significant difference is found between the cases and controls concerning the above variables, and no significant difference is found between the average self-esteem scores about gender in both cases and controls. Males have a mean self-esteem score of 24.94 and females score of 25.17 and this is similar to the results of Gans et al. 2003 which showed no difference between boys and girls with learning disabilities (LD) on self-esteem scores.[10]

Our study compared self-esteem scores on the RSES scale showed statistically significant lower scores in the SLD group (mean score of 14.72) than the controls (mean score of 21.56). This result is similar to Gadeyne et al., 2004 which showed lower self-concept in SLD children than in their peers.[11] The comparison of individual sub-scale scores of the Rutter scale in our study shows a significant positive correlation between neurotic behaviors, behavioral problems, and SLD children. It was found to have higher mean values in neurotic behavior (0.76) and behavioral problems (1.40) in comparison with their normal counterparts (0.12 and 0.30). No significant difference is found in the Rutter scale's deviant/antisocial behavior subscale between cases and controls in a study by Sridevi et al. 2015.[12]

In our study, the behavioral problems were more commonly associated with SLD children than their peers, and these were more common in girls when compared with boys in the SLD group (report by Zyoudi 2010).[13] VADRS scale is used to screen for ADHD, ODD, CD, and anxiety/depression in our study. According to Alevriadou and Giaouri, 2016, there is a significant correlation only between ADHD-inattentive type (P=0.022) and SLD.[14] Dyson (2003) reported that children with LD displayed more behavioral problems, including internalizing behaviors such as anxiety, somatic complaints, and social withdrawal and externalizing behaviors such as aggression and conduct problems.[15] This finding contrasts with Lemmond (2016) which showed a statistically significant association between depression and SLD children.[16] Also, Bender and Wall (1994) showed SLD children suffered from a wider range of social-emotional problems, such as loneliness and depression.[17]

Limitations of the study

The main limitations were the study population only included children who are attending hospital, which can lead to gross selection bias, small sample size, generalization of the study results to all clinical settings is not possible in a tertiary care hospital-based study, social functioning of the SLD children was not assessed, and the children with SLD were not sub-grouped based on the types on SLD (i.e., reading, writing, and mathematics).

CONCLUSION

These conclusions can be made based on the above findings and statistical analysis such as the history of pre-term delivery, birth trauma, neonatal complications, or developmental delay has no significant impact on the development of SLD (as no statistical correlation is found). A significant correlation is found between lower self-esteem and SLD children and higher rates of neurotic behavior and behavioral problems in SLD children. ADHD, predominantly inattentive type, significantly correlated with that SLDs.

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Authors Contribution:
ABM- Data collection, data analysis, manuscript preparation; **KV-** Editing manuscript.

Work attributed to:
Department of Psychiatry, Tirunelveli Medical College Hospital, Tamil Nadu, India.

ORCID ID:
Dr. Asarnisa Begum M - https://orcid.org/0009-0003-9527-1013
Dr. Kandasamy V - https://orcid.org/0009-0000-5130-6171

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