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Original Research Article

Pattern of specific learning disability and awareness among care providers in children between 8-12 years

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ABSTRACT

Background: Specific learning disability (SLD) is known to cause great amount of psychological stress to the children and their parents. Current study was aimed to find out the prevalence, profile of errors in Specific learning disability among school students studying in 3rd to 6th standard and their perception by teachers and parents.
Methods: A Cross-sectional study was conducted at two Government and two Private Schools in Gwalior. 800 students studying 3rd to 6th standard. The details of every student were filled in a proforma which included their academic performance, teacher's opinion and parents concern for them. Based on this from each class 10 percent of low performing students were selected and they were subjected to Visual, Hearing, IQ assessment and NIMHANS index for specific learning disability.
Results: A total of 23 students were identified as having Specific learning disability, with a prevalence of 2.87%. The most common reading error was omitting words and writing error was missing letter and spelling error. Out of 23 students , only 4 students were rightly picked up by teachers as having specific problems in reading and writing, while in remaining 19 students teachers were having vague generalized opinion of poor academic performance ($P<0.05$).Out of 23 students, 14 parents were not having any scholastic concern about their children ($P<0.001$). These students on Intelligence Quotient assessment, showed low performance scores as compared to their verbal scores.
Conclusions: The prevalence of Specific learning disability was 2.87% and these students were having lower performance scores in IQ. Teachers and parents were unable to perceive about Specific learning problems.

Keywords: Intelligence quotient, NIMHANS index, Prevalence, Specific learning disability

INTRODUCTION

Learning disorders are among the most frequently diagnosed developmental disorders in childhood. Children with learning disabilities have significant impairment in reading, writing and mathematics, in spite of normal intelligence and sensory abilities.

According to DSM 5 criteria, Specific Learning Disability is a neurodevelopmental disorder of biological origin manifested in learning difficulty and problems in acquiring academic skills markedly below age level and manifested in the early school years, lasting for at least 6 months; not attributed to intellectual disabilities, or neurological or motor disorders. In reading disability, children will have difficulties in phonemic sensitivity, phonetic decoding, word recognition, word decoding skills and reading comprehension.

Some studies in India calculated the prevalence of specific learning disability to be 3-10%.[1] In Chandigarh the prevalence was found as 1.58% and in southern India

it was 6.6% and Karnataka showed the prevalence as 15.17% In students with the learning difficulties, other aspects of development seem to be fine.[2-4]

Early signs of learning difficulties may appear in the pre-school years but they are only diagnosed after starting formal education. Formulating indigenous assessment tools for intelligence quotient and testing specific learning disability in various languages spoken in India would be a huge task. Specific Learning Disability has been now included in the Rights of Persons with Disabilities Act, 2014.[5] The identification of specific learning disability cases in Indian context is complex as conditions that are far from ideal, socio-economic factors and multilingualism, limited proficiency in medium of instructions may play a significant role in Indian educational system. The assessment of SLD is further complicated by the fact that various Education Boards (Central and State Boards) have differing level of academic difficulty. Also, there are only few studies conducted in India to identify the burden of specific learning disability in school children.

Children with learning disabilities also exhibit significant behavioral problems than children without disability in the form of hyperactivity and aggression. It is further estimated that 15-30 percent of children with learning disabilities have emotional and behavioral problems.[5]

METHODS

This cross-sectional study was carried out during 2016-2017 on school students of Gwalior after approval of research protocol from ethical committee of G.R.M.C, Gwalior (Madhya Pradesh). Then written consent were obtained from the parents and teachers. Total 800 students were tested and the low performing students were identified by collecting the academic records and then from each class 10 percent of low performing studentswere selected. After initial assessment those low performing students were subjected to visual and hearing assessment in G.R.M.C Out Patient Department.

Those students who do not have visual and hearing impairment were subjected to intelligence testing (IQ Score) by using Malin's Intelligence Scale for Indian Children.[6] Those students with IQ score less than 80 were excluded and the remaining students were subjected to NIMHANS index for specific learning disability.[7]

Inclusion criteria

Students studying 3rd to 6th standard

Exclusion criteria

Students with visual and hearing impairments, intellectual disability (IQ<80), chronic medical conditions on medication.

Tools used

- Student proforma
- Malin's Intelligence Scale for Indian children: An Indian version of Wechsler Intelligence Scale for Children (WISC), designed for children 6 to 15 years. Reliability of the scale established by Pearson's correlation Coefficient is 0.91.[6]
- NIMHANS index for specific learning disability: can be applied to children of age 5 to 12. If a child's performance was 2 classes below what was expected for him/her, the diagnosis of Specific Learning Disability was made.[7] The test retest reliability showed a high significant correlation (0.53).

Statistical analysis

Analysis was done with SPSS version 21 software. Descriptive and frequency analysis was done. Comparison was made by Chi square test. P<0.05 was considered significant.

RESULTS

Out of the 800 students who had been studied in 2 government and 2 private schools in Gwalior studying in classes 3 to 6.

The students had been screened for hearing and observed that 2 students were having hearing difficulty (>60 db loss) and 2 students were found to be visually impaired (>6/18) and one student was found to have IQ score less than 80so they were excluded. In the remaining, 23 students were identified as having Specific learning disability, which accounted for prevalence of 2.87% and 5 students were found to be having learning difficulties.

In the academic performance of students, the last summative assessment was compared and found that students with SLD was low scoring as compared to students without SLD and it was significant (P -<0.001) (Table 1).

The SLD students were having low attendance percentage and it proved to be significant (P -<0.001). 10 Students (43%) diagnosed as SLD was having a history of disciplinary action mainly in the form of imposition (writing) and this was significant (P -<0.001) (Table 2).

Errors in reading

Among 23 students who were diagnosed as SLD, 20 students were diagnosed as having Reading disability (Dyslexia) (Table 2).

The prevalence of dyslexia was 2.5%. Among those students who were having Reading disability (Dyslexia), the reading error which was found maximum was omit words which was observed in around 74% of students.

Other errors which was found in large numbers were guessing words (65%) and reading word by word (43%).

Other errors found were adding words, reversing words, ignoring punctuation.

Table 1: Academic performance of students with SLD.

Variables	Categories	Sld present	Sld absent	Chi square value	P value
Results of last summative assessment	A (81-100)	0	360	278.6	<0.001
	B (61-80)	0	360		
	C (41-60)	11	38		
	D (31-40)	5	12		
	E (0-30)	7	7		
Attendance percentage	<50%	8	20	116.03	<0.001
	50-75%	13	92		
	>75%	2	665		
Disciplinary action	Yes	10	1	309.55	<0.001
	No	13	776		

Table 2: Reading errors of students with SLD.

Reading errors	Reading disability (dyslexia) present (N=20)	Percent
Reads word by word	10	43
Ignores punctuation	6	26
Add words	7	30
Omit words	17	74
Guesses at word	15	65
Reversal of words	5	22

Errors in writing

Among 23 students who were diagnosed as SLD, 11 students were diagnosed as having writing disability (Dysgraphia) (Table 3).

Table 3: Writing errors of students with SLD.

Writing disability (dysgraphia)	Writing disability (dysgraphia) present (n=23)	Percent
No space between words	7	30
Missed out letter	11	48
Substituted letter	8	35
Reversed a letter	5	22
Added a letter	6	26
Wrong capitals	4	17
Spelling	11	48

Among those students who were having writing disability (Dysgraphia), the writing error which was found maximum was missing letter and spelling error which was observed in around 48% each.

Other errors found were substituting, reversing, adding words, no space between words.

Errors in calculation

Among 23 students who were diagnosed as SLD, 18 students were diagnosed as having Arithmetic disability (dyscalculia) (Table 4).

Table 4: Frequency of calculation errors in students with arithmetic disability (dyscalculia).

Arithmetic disability (dyscalculia)	SLD present (n=23)	Percent
Simple addition	0	0
Simple subtraction	0	0
Simple multiplication	1	4.3
Simple division	9	39.1
Graded addition	7	30.4
Graded subtraction	10	43.4
Graded multiplication	16	69.5
Graded division	18	78.2
Fraction addition	16	69.5
Fraction subtraction	18	78.2
Fraction multiplication	18	78.2
Fraction division	18	78.2

Among those students who were having arithmetic disability (dyscalculia), the calculation error which was found maximum was fraction division, fraction multiplication, fraction subtraction, and graded division all of which were found in 18 students (78.2%).

All the SLD students were able to do simple addition and simple subtraction without errors.

Teacher's role and parents concern

Out of 23 students with SLD, only 4 students were rightly picked up by teachers as having specific problems in reading and writing, while in remaining 19 students teachers were having vague generalized opinion of poor academic performance and poor attention which showed that majority of teachers were not helpful in identifying SLD which was significant (P<0.05) (Table 5). Around 14 parents whose children were diagnosed as SLD was not having any scholastic concern about their children and it was significant(P<0.001).

Table 5: Teacher's and parental concern of students with SLD.

Variables	Categories	Sld present	Sld absent	Students identified as SLD	Chi square value	P value
Teachers opinion	Problem in reading	3	1	20	378.13	<0.05
	Difficulty in writing	1	1	11		
	Problem in calculation	0	0	18		
	Poor academic performance	16	57	-		
	Poor attention in class	3	23	-		
	None	0	695	-		
Parents concern	Problem in reading	1	1	20	259.07	<0.001
	Difficulty in writing	2	1	11		
	Problem in calculation	1	1	18		
	Poor attention	5	5	-		
	None	14	769	-		

Intellectual functioning

The mean IQ score for students with SLD was 90.76, the mean verbal score for students with SLD was 96 and the mean performance score for students with SLD was 84.4 (Figure 1).

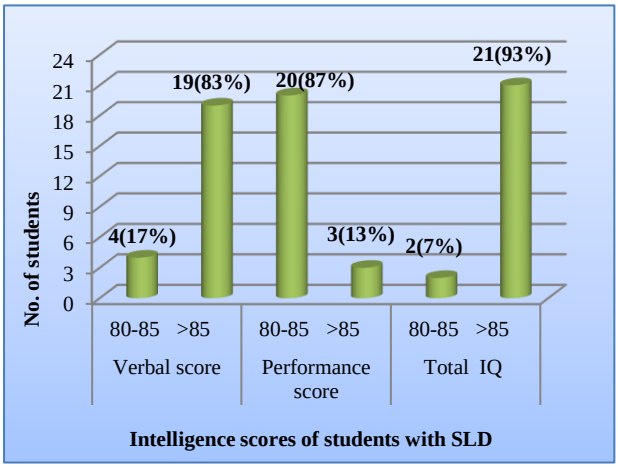

Figure 1: Intelligence scores of students with SLD.

It was evident that the students who were identified as SLD was having low performance scores as compared to their verbal scores in the intellectual functioning tested with Malins Intelligence scale for Indian Children.

Out of 23 students with SLD around 20 (87%) students were having their performance scores in the range of 80-85.

DISCUSSION

Learning disability is a common problem among children and it is an important cause of stress. If not remedied at the earliest, learning disabilities will lead to failure in exams and can cause emotional and behavioral problems in children. Hence all children with learning problems should be evaluated for early identification of learning disability.

Out of 800 students who were taken for the study, 23 students were diagnosed as specific learning disability which accounted for a prevalence rate of 2.87% and 5 students were found having learning difficulties. This rate was higher than studies done by Arun P et al where the prevalence was about 1.58% and its comparatively lower than the prevalence seen in some south Indian studies done by Mogasale V who showed the prevalence to be 15%.[2,4] The reasons for variations in the rate within our country may be due to difference in selection of tools, sample selection, and study setting

In the academic performance of students, the result of summative assessment of last year was compared and found that all students with SLD was low scoring and around 48% of students scored 41-60 as compared to students without SLD and it came to be significant (P -<0.001). According to National centre for specific learning disabilities, New York 2012 survey it was found that around 12% to 26% of students with learning disability received average or above-average scores on math and reading assessments, compared with 50 percent of students in the general population and 7% to 23% of

students with learning disability received very below-average scores on academic performance, compared with only 2 percent of students in the general population.[8] The students with low attendance percentage was more among the students with SLD which was found that around 13 students (56%) had <75% and 8 students (35%) had <50% attendance than without SLD and it proved to be significant (P -<0.001). The same interpretation was found by Bandla S et al who showed that SLD children have significant school problems in the form of school refusal, poor academic performance.[3] Around 10 Students (43%) diagnosed as SLD was having a history of disciplinary action mainly in the form of imposition (made to write multiple times)and suspension and this finding was significant (P -<0.001) which is similar to the finding obtained from National centre for specific learning disabilities, New york which interpreted that one in every two students (50%) with Learning Disability faced a school disciplinary action such as suspension or expulsion and 19% of students with Learning disability are dropped out of the school.[8]

The prevalence of dyslexia was 2.5% (20 students). Among those who were having dyslexia, the significant reading errors were omitting words observed in 74% of students. Errors which was found in large numbers were guessing words (65%) and reading word by word (43%). Other errors found were adding words, reversing words, ignoring punctuation. Similar kind of results were observed by Arun P et al in which significant reading errors included were omitting words, phonetic error, spelling, guessing, punctuation and added words.[2]

The prevalence of dysgraphia was 1.3% (11 students). Among dysgraphic students, the significant writing errors were missing letter (48%) and spelling error (48%). Other errors found were substituting, reversing, adding words, no space between words. Results analyzed by Arun P et al showed the significant writing errors were omission of space, wrong capitals and added letters.[2]

The prevalence of dyscalculia was 1.3% (11 students). Among dyscalculic students, the significant mathematical errors were fraction division, fraction multiplication, fraction subtraction, and graded division. All the SLD students were able to do simple addition and simple subtraction without errors. This could be because the SLD students were not able to cope up with the increasing complexity of mathematics.

The teacher's opinion in identifying a case of SLD showed that out of 23 students with SLD, only 4 students were rightly picked up by teachers as having specific problems in reading and writing, while in remaining 19 students teachers were having vague generalized opinion of poor academic performance and poor attention which showed that majority of teachers were not helpful in identifying SLD which was significant(P<0.05). Arun P et al observed that a screening proforma given to teachers was not useful for predicting SLD but number of cases ruled out for SLD had high accuracy.[2] The difference in our study was due to the lack of awareness of teachers about SLD in the state. Watson, Julie had conducted a nationwide study in Australia and reported that the teachers are poor in identifying the students having specific learning disability and also 50% of teachers had no additional training in literacy or special education for the students who were diagnosed as specific learning disability.[9]

The parental concern about the students having SLD showed that around 14 parents whose children were diagnosed as SLD was not having any scholastic concern about their children in view of reading or writing and it was significant. This data also showed the lack of awareness of parents about SLD in the state. Similar results were observed by Arun P et al.[2]

The mean IQ score for students with SLD was found in present study as 90.76, the mean verbal score for students with SLD was 96 and the mean performance score for students with SLD was 84.4. It was evident that the students who were diagnosed as SLD was having low performance scores of intelligences mainly in coding and mazes design as compared to their verbal scores in IQ score. But this is in contrary to previous study done by Arun P et al who found lower verbal score in students with SLD, because students with SLD had good logical reasoning and comprehensive ability with much of the problem lying with arithmetic and phonemic awareness.[2]

CONCLUSION

Prevalence of 2.87% of specific learning disability in age group 8-11 years school children was observed in the present study. Non availability of standardized tests in vernacular language cause a major disadvantage in identifying more students with specific learning disability. Teachers were not helpful in identifying majority of cases of SLD but they were having vague assessment of students with poor academic performance and poor attendance. Parents were totally unaware of the situation of their children in schools, which was seen in the present study. The learning disabled students was having low performance scores of intelligence as compared to their verbal scores in IQ score. This could be the reason for deceptive perception by teachers and parents in awareness of specific learning disability since the verbal scores of IQ of students are normal.

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