

Assessing knowledge of primary school teachers on specific learning disabilities in two schools in India

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ABSTRACT

Background: Evaluation of fund of knowledge about SLD among kindergarten and primary school teachers is essential to avoid misdiagnosis of SLD and to plan for specific teacher education to enable early identification of SLD among children. **Aim:** To assess the knowledge of learning disability among primary school teachers in India and to investigate its psychometric properties. **Materials and Methods:** An observational study was carried out 34 primary school teachers from 2 different schools in Puducherry town agreed to participate in this study with informed consent. We used a multiple choice questionnaire format with a total of 50 questions, 5 choices for each question and a total score of 50. The study was held at the schools where these teachers were employed using pen and paper testing method and data were entered into the computer for statistical analysis. **Statistical Analysis:** Total scores on the questionnaire of all teachers were calculated. Content validity, reliability coefficient, discrimination factor, and facility factor were analyzed using SPSS software. **Results:** 29% of the questions were correctly answered by all 34 teachers. The mean total score for this sample was 14.50 ± 9 and total item score for the 50 items was 9.90 ± 4 . Cronbach's (α) reliability was 0.89. Overall discrimination index was +0.2 and facility factor analysis score was 0.26. **Conclusions:** Validation of this new screening questionnaire was successful in Indian setting. It has to be used in other settings to extrapolate our findings.

Key words: Kindergarten, primary school, specific learning disability

INTRODUCTION

Specific learning disabilities (SLD) include problems in one or more areas of learning such as reading, writing, listening, speaking and mathematics.^[1] It is usually identified among preschool and primary school children although it tends to

progress into adulthood. Globally, it still remains as “one of the least understood and most debated conditions that affect children”. There are a variety of genetic, prenatal, perinatal, and postnatal factors that can lead to variations in the development and problems with learning and behavior. This highlights the need for early-age interventions to address SLD. In this context, research has identified “high-risk children” who are more likely to develop and manifest SLD and this involves fostering development in a combination of areas such as perceptual, motor, language, cognitive, social and emotional. Elliot and Hall's^[2] defined the young-at-risk group of children between 4-6 years of age as follows

“children who manifest some or all of the following behavioral characteristics: Difficulty in using language fluently and effectively in a range of situations, inability to attend to and preserve with tasks and activities, lack of purposefulness, imagination and variety in play, lack of initiative, lack of ‘normal’ social and emotional maturity”

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These groups of at-risk children have more likelihood of having SLD and if they are identified early at school by teachers or at home by parents, appropriate remedial measures can be set in. Bio-ecological Model of Bronfenbrenner and Ceci^[3] is a holistic model that explains the complex, multimodal factors that include intrauterine, home, parental and finally school environment as an ongoing interactive system that determines the neurological and behavioral developmental process of all children and if any of these are at fault, the child can be categorized into the above risk group.

In the Indian context, among various established interventions, programs such as “maternal and child health improvement”, “community education” (parent programs to improve infant or child nutrition, better physical safety, and increasing environmental stimulation), “targeted early interventions” (up-skilling of adaptive and social skills, child abuse recognition and social services referral), “Instructional interventions”, the role of contextual factors such as poverty, parental illiteracy, lack of access to pre-school instruction, overcrowded classrooms and poor classroom teaching play a significant role.^[4] Since, major part of instructional inputs are imparted when the child first formally enters a school environment, the need for well-equipped teachers or instructors gains attention over other factors.

In the United States and United Kingdom, there is very specialized program for teachers and also support for SLD children, but in India, such services are not economically feasible. But, research over the years has shown that teachers at Indian schools get a fairly good insight into the learning and other problems of children during the course of study. Hence, educating and training teachers in improving quality of educational instruction is a very useful method of minimizing school drop-outs and enhancing individual performance.^[5,6,7]

There is little doubt now that early identification provides ample time and scope for planning remedial measures for children with SLD.^[8,9] Till date, studies worldwide have utilized informal identification of children with learning and associated problems (like difficulty in focusing attention on tasks). Any informal assessment by teachers as above based on their prior learnt knowledge or experience of seeing LD children may unnecessarily subject children without LD also into the rigorous task of formal LD testing. Unfortunately no such standard psychometric instruments exist that can assess teacher's knowledge on LD. In Indian context, where formal testing for such a huge population may not be economical, teacher training and education on LD can be a useful alternative.

Hence we planned to assess the knowledge of primary school teachers on specific learning disabilities in two schools in India.

MATERIALS AND METHODS

In this first ever observational study design, a survey was carried out among various schools in the Union Territory of

Puducherry, South India. The study was carried out jointly by 2 principal investigators and four undergraduate nursing students. The study duration was from January to March 2010. The study protocol was approved by the Institutional Ethics Committee before data collection.

All primary class teachers available at each school on the day of data collection were included for the study. No particular method of randomization was adopted in this case. The data collection process involved randomly selecting the schools which were English medium and also had primary level education. Informed consent was discussed from the director or the principal of each school first by electronic E-mail and then by personal contact. Informed consent was also offered to the individual teachers.

Procedure

Fifteen English medium government and private schools were contacted through the Directorate of Education but only 2 schools finally agreed to participate in the study. The rest were unable to offer their time and resources during the time of this study and hence could not be included at any time during the study period. Informed consent was obtained from the teachers of the 2 schools using pen and paper method. The sample available on the day of data collection was the best that was available inspite of initial reminders for all primary school teachers to be present.

Sample characteristics

Certain factors were considered in choosing the sample, such as the type of school, the school syllabus (Matriculation, Indian Certificate of Secondary Education or Central Board of Secondary Education), English or Tamil medium based schools, and Co-education or boys/girls only schools. Keeping in mind, the limitation of time, we decided to select a sample of both sexes, of any syllabus and only English medium of Instruction. This was done to minimize the number of confounding variables.

The following criteria were applied in recruiting the desired sample of teachers. Inclusion criteria included primary school teachers of any age group teaching in an English medium school and could participate with Informed consent. Exclusion criteria were refusal of informed consent and teachers absent on the day of data collection. Due to lack of literature available on this topic, sample size calculation was not considered.

Development and description of tool

The basic objective of the study, to assess the fund of knowledge of primary school teachers was the starting point in the development of the new screening tool. The following points were considered in the initial phase of designing the tool.

Type of information studied

Keeping the null hypothesis in mind, fund of knowledge was considered as a categorical variable, in which case, the responses will be either “yes” or “no” knowledge on SLD.

But since, there could be too many individual variations in response, to allow for guessing of answers and to make the data qualitative also, the more appropriate method of analysis would be to study the “extent” of knowledge of these teachers on SLD. Hence it was decided to choose the multiple choices of answers.

Topic of interest

Since SLD is a multidimensional topic, the tool requires data assessment under various domains so that all aspects of the problem can be incorporated. Whenever large amount of qualitative observational data from a large sample, needs to be collected for a study, a multiple choice questionnaire is chosen due to its appropriateness.

Characteristics of sample

Although, it would be ideal to study a large sample after sample size analysis from previous studies in the same topic, due to paucity of literature on this subject area, we had to restrict our sample to a minimum of 30.

Research design

It was easy to decide on a prospective method of research for data collection. Since our objective did not include any intervention in this sample, an observational methodology was selected. One of the very useful designs of observational research that is used when quick assessment of large data is planned, a “Survey” design was chosen.

Evidence from literature

Multiple choice questions are used extensively in nursing research and education and play a fundamental role in the design of research studies or educational programs.^[10]

Based on the above considerations, we developed a 50-item multiple choice questionnaire, comprising of 13 domains [Table 1]. The entire questionnaire was designed with the support of principal investigator and co-researchers in an initial brainstorming session to identify various possible domains of SLD followed by framing of individual items, the choices, forming distractors, and after 2 rough drafts, a final draft was prepared. The following were the domains of the final questionnaire in this order. Each MCQ had 5 choices labeled “a” to “e”, with only 1 correct answer.

Scoring technique

The total mark of the questionnaire was 50. Every single correct answer would get 1 mark and a wrong answer, unanswered item, or more than one answer if chosen; all would receive “0”. There was no negative marking. The questionnaire was presented without specifying the individual domains and the same order of items as in the original version was maintained. Since pre-test analysis of validity was not possible, validity of the screening tool was included under post-test statistical analysis.

Statistical analysis

SPSS Software trial version No18 was used for all the analysis. Descriptive analysis included frequency tables,

cross tabulations, mean, standard deviation. Validity of the questionnaire was recorded as percentages of expected responses. Reliability coefficient involved calculating (Cronbach’s alpha) and the desired score was ≤ 0.8 , which indicates very good reliability. To test the abilities of individual candidates, discrimination analysis was done and expected scores were between -1 to +1. Facility factor analysis was done to test the difficulty of each item, the impact of guessing and the strengths of distractors and expected score was from 0 to 1.

RESULTS

Out of 15 schools that were contacted, only 2 agreed to participate in the study. But all primary school teachers in these 2 schools gave informed consent to participate formed the sample of the study. There were at least 4-5 teachers who were not present on the day of data collection for various reasons and could not be included in the sample. The sample coverage rate was excellent as our target sample size was at least 30. (Raw scores compiled).

School information

At the end of the 2 months study period, two schools agreed to participate in the study. The school details are as given in Table 2.

Sociodemographic profile of the participants

Of the 34 teachers, the sex ratio was 1 male and 33 female teachers. The mean age of the sample was 36.00 (SD 6.74)

Table 1: Domains of the 50-item multiple choice questionnaire

Domains	Number of MCQ’s
Epidemiology of LD	3
Causes of LD	3
Overall definition of LD	3
Reading disorders	5
Writing disorder	5
Mathematics disorder	5
Speaking/Language disorder	5
Listening disorder	5
Testing or identification of LD	3
Management of LD	3
Comorbidities with LD	3
Course of LD	3
Role of teachers, parents, schools in LD	3

Table 2: School information

Name of school	Syllabus	Frequency (n)	Percentage
Primrose school, Puducherry	ICSCSE	11	32.4
National high school, Thavalakuppam, Puducherry	Matriculation	23	67.6
Total (n)		34	100

and ranged between 27 to 46 years. Mean duration of primary school teaching was 3.60 (SD 3.84) and mean duration of working at the current school was 8.20 years (SD 6.22). Majority (47 %) of the teachers were between 20 to 25 years of age. Ten (29.4%) were in the 25 to 35 years age group. Six (17.6%) were in the 35 to 45 years age group and two teachers were above 45 years of age. The number of years as a primary school teacher was between 1-12 years and 18 (52.9 %) teachers had upto 1-5 years of teaching experience, 8 (23.5%) had 6 months to 1 year, 4 (11.8%) had 5 to 10 years, 3 (8.8%) had less than 6 months and only 1 (2.9%) had more than 11 years of experience. Fifteen (44.1%) teachers had some previous experience with LD either during their teacher training period or through some other exposure methods prior to this assessment. Nine teachers (26.5%) had seen people or friends with suspected LD in the past prior to this assessment and were able to recall that information. The following item analysis of parameters was conducted to evaluate the psychometric properties of the self-designed multiple choice questionnaire that was used in this study. Reliability analysis showed a very good Cronbach's alpha score of 0.892. Discrimination index was within the normal range of -1 to + 1 and the facility factor was also within normal limits of 0 to 1. The total mean score was 14.50 (± 9) much less in both the schools with Primrose being better than the National School [Table 3].

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The total score of all participants and the number of years of work experience as primary school teacher by all participants was tested for any possible associations, but the results were all not statistically significant [Table 4].

DISCUSSION

The results of this study showed that the fund of knowledge of primary school teachers on SLD was only 29% in this sample, which indicates poor fund of knowledge. These findings

Table 3: Total and item scores

Parameters	N	Minimum	Maximum	Mean	Standard deviation
Total score	34	2	36	14.50	8.826
Total item score	50	3	20	9.90	3.738

Table 4: Correlative analysis of total and item scores

Parameters	Value	Asymp. std. error ^a	Approx. T ^b	Approx. sig.
Contingency coefficient	0.857	-	-	0.082
Pearson's R	0.081	0.192	0.460	0.649 ^c
Spearman correlation	0.078	0.190	0.443	0.661 ^c

a. Not assuming the null hypothesis, b. Using the asymptotic standard error assuming the null hypothesis, c. Based on normal approximation

could be explained based on studies that have associated the prevalence of SLD and knowledge of teachers on SLD. In our study also, the prevalence of SLD among the students being unknown, it is likely that teachers face lesser need to acquire knowledge on SLD and its management.^[11] Even this 29% is probably only a superficial knowledge of these teachers on SLD. Hence, it might be irrational to associate their prior reading exposure of SLD during their teacher training period. Another incidental finding is that the number of years of experience of teaching primary school children did not show any statistically significant association with the fund of knowledge on SLD (Pearson's R = 0.64). It was surprising also to note that 44% of these teachers had some form of prior exposure to SLD and 9% even had friends or family members with SLD.

If the individual scores are examined, it was interesting to note that one teacher had score 37 out of 50 and she had reported of having a family member with SLD. Her mother-tongue was English and she had finished her teacher training program in the United States and she shared her personal interest on SLD and other childhood related disorders. Some other studies that have examined the presence of SLD among teachers as an obstacle to diagnose similar problems in their students seems to complicate this situation further.^[12] This finding highlights the absence of exposure to this important topic of learning disabilities in the Indian teacher training academic program in comparison to standards of teacher training in the Western countries.

A very important issue that was evident at a very early stage of this study was the difficulty faced by the research team was the refusal of more schools to participate in this study. Some of the reasons quoted by these schools were unwillingness to reveal the existing lack of knowledge levels among their teachers, lack of time for such activities due to examinations, not feeling that SLD was a problem among their students and in some cases, no reasons at all. From the 2 schools that had participated, another feedback obtained was the lack of any immediate benefits to the schools from participating in the study. It may be appropriate to extrapolate these factors to other settings also since the geographic and socio-cultural settings of most schools are similar across India, rural being worse than urban. Also worrisome is the fact that rural schools are more disadvantaged than urban schools and this issue could be much bigger in a rural setting where more school drop-outs and less of children finish school.

This new screening multiple choice questionnaire showed robust psychometric properties such as very good reliability. A desirable discrimination index indicates that the questionnaire has the ability to differentiate between those participants who actually know the subject and those who do not. Further factor analysis showed expected results which means that the problem of guessing the right answer was not a problem and that the distractors chosen under each item were able to distinguish those who actually know the right answer and those who rely purely on guessing. Although the

fund of knowledge was not encouraging, the questionnaire did demonstrate good content validity by producing the actual results. Henceforth, this questionnaire can be confidently used as a screening tool to study the knowledge levels of primary teachers on SLD. Whether it can be used on teachers at a higher secondary level needs evaluation. It is worth noting that early identification of SLD is ideal to deal with it and in that context, our questionnaire serves the purpose.

CONCLUSION

SLD can be identified as early as 3 to 4 years of age when children enter preschool and teachers need to be sensitized on how to screen or at least be able to differentiate SLD from other problems of learning. In this regard, our study provides a tool to study how much these teachers know about SLD and also serves to plan for teacher education programs, workshops, etc., to improve the existing situation of our school teachers so that they will be able to effectively make early identification of SLD which is one of the management strategies in treating SLD.

Strength of our study

This is the first ever study that has designed and empirically tested a culturally relevant questionnaire to study about teacher's knowledge of SLD although many unstructured, untested scales or questionnaires exist.

Limitations of our study

Since our sample was small, we were not able to test if there were any group differences between individual schools. Also shorter duration of our study restricted our interest in studying wide variations that could exist between urban, semi-urban and rural schools. Refusal of some schools was an unexpected problem that we faced in our study.

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