International Journal of Contemporary Pediatrics
Sajeev S et al. Int J Contemp Pediatr. 2026 Jul;13(7):1170-1177
https://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20261909

Original Research Article

Awareness and knowledge of specific learning disorder among rural primary school teachers in South India: a cross-sectional questionnaire-based study

Sneha Sajeev[1], Dinesh Kumar Narayanasamy[2]*, Vasanthan Tanigasalam[2]

[1]JIPMER Karaikal, Puducherry, India
[2]Department of Pediatrics, JIPMER Karaikal, Puducherry, India

Received: 04 May 2026
Accepted: 10 June 2026

***Correspondence:**
Dr. Dinesh Kumar Narayanasamy,
E-mail: dinesh.paed@gmail.com

ABSTRACT

Background: Specific learning disorder (SLD), particularly dyslexia, is a common neurodevelopmental condition that is often under-recognized in rural settings. Primary school teachers play a key role in early identification. Objectives were to assess awareness and knowledge of SLD among rural government primary school (GPS) teachers and identify associated factors.
Methods: A cross-sectional study was conducted among 220 rural GPS teachers in rural, South India (February-March 2024). All rural GPS were included, and all available teachers were invited to participate. Data were collected using a validated questionnaire assessing awareness (8 items) and knowledge (12 items). Scores were categorized using the 25th percentile cut-off. Associations were analyzed using the chi-square test and expressed as odds ratio (OR) with 95% confidence intervals (CI).
Results: Of 220 teachers (mean age 39.2±6.5 years; 80% female), 30.0% (95% CI: 24.1-36.4) had received special education training (SET). Lower-quartile awareness and knowledge scores were observed in 20.9% (95% CI: 15.8-26.9) and 24.1% (95% CI: 18.7-30.2), respectively. Knowledge gaps were greatest for dyslexia (41.5%). SET and prior experience teaching children with SLD were associated with lower odds of poor awareness and knowledge. Most teachers expressed willingness for further training.
Conclusions: Gaps in SLD knowledge persist among rural teachers. Strengthening teacher training within existing school systems may improve early identification and referral.

Keywords: Specific learning disorder, Dyslexia, Teachers, Rural health, Early diagnosis

INTRODUCTION

Early identification of developmental and learning disorders remains a critical yet under-implemented component of community child health surveillance across South Asia.[1] In India, where nearly 40% of the population comprises children and adolescents, delayed detection of developmental and learning challenges during early schooling is associated with impaired academic, emotional, and social functioning, highlighting the importance of timely recognition and referral.[2,3]

SLD reflects underlying neurodevelopmental differences in academic skill acquisition and includes persistent difficulties in reading (dyslexia), written expression (dysgraphia), and mathematics (dyscalculia) despite adequate instruction and intelligence, as defined in the DSM-5 framework.[4,5] SLD is the most common learning disorder among school-aged children, with a reported prevalence of 4-11%.[6] Although early neurobiological markers associated with reading difficulties have been identified, SLD remains under-recognized in many developing countries, including India, where systematic

school-based screening and remedial services are inconsistently implemented.[7,8]

The National Education Policy (NEP) 2020 emphasizes early recognition of learning difficulties and school-based support, aligning with global inclusive education frameworks that position teachers as frontline agents in identification and referral.[7,8] SLD typically manifests during the early years of formal education, when foundational literacy and numeracy skills are acquired, making the primary school period a critical window for effective intervention.[4]

Large-scale identification by health professionals alone is impractical in populous, predominantly rural settings.[9,10] School-based health programs rely on teachers for early identification and referral, while children are often brought to health facilities only after prolonged academic failure. Teachers are therefore uniquely placed to observe learning trajectories and recognize early deviations, provided they possess adequate awareness and knowledge of SLD.[12]

However, Indian studies report inconsistent teacher knowledge regarding early markers, associated learning difficulties, and evidence-based interventions, particularly in resource-limited government school settings with restricted access to specialist services.[8,13-17] Rural GPS teachers, who deliver foundational education to a large proportion of India's pediatric population, remain under-studied with respect to their capacity to identify SLD.[9]

Thus, this study aimed to assess awareness and knowledge of SLD among rural GPS teachers, identify socio-demographic and training-related factors associated with competency variations, and explore integrating SLD training into existing community health and education platforms in resource-limited settings.

METHODS

This cross-sectional, questionnaire-based observational study was conducted between February and March 2024 in rural GPSs of Karaikal district, Puducherry Union Territory, India. It represents a typical South Indian rural district with predominantly agricultural communities, limited specialist health services, and school infrastructure characteristic of resource-limited settings. Ethical approval was obtained from the institutional ethics committee (JIP/IEC-OS/2023/474) dated 18/01/2024. Written informed consent was obtained from all participants prior to data collection.

Dyslexia was the primary focus of assessment, consistent with its status as the core and most frequently recognized subtype of SLD. Related domains of dysgraphia and dyscalculia were included to reflect the broader SLD diagnostic framework.[13-17]

The study population comprised GPS teachers teaching children from kindergarten to Class 5 in rural south India. All eligible teachers present at the time of the school visit and willing to participate were included. Teachers on deputation or those who returned incompletely filled questionnaires were excluded.

Sample size was calculated based on an expected dyslexia awareness prevalence of 83.4% among elementary school teachers, precision of 5%, and 95% confidence interval.[13] Using the formula $n=Z^2 P(1-P)/d^2$, with Z=1.96, P=0.84, and d=0.05, and adjusting for 5% non-response, the required sample size was 220 teachers.

All GPSs in rural district conducting kindergarten through class 5 were included in the study. All eligible teachers present at the time of the school visit and willing to participate were invited to complete the questionnaire. Thus, a universal sampling approach of available participants was adopted. All 62 rural GPSs in that district were included, and 220 teachers participated.

Data were collected using a structured, self-administered questionnaire developed through review of published literature on teacher awareness, misconceptions, and early identification of SLD. Items were newly constructed to suit the Indian primary school context. The questionnaire underwent expert review by a panel comprising two pediatricians, two psychiatrists, and a senior primary school teacher to establish face and content validity. Following translation into Tamil and back-translation to ensure semantic equivalence, the instrument was pilot tested among 20 GPS teachers, with minor modifications implemented based on feedback.

Section I of the questionnaire captured demographic and professional characteristics including age, gender, teaching experience, grade level taught, educational qualification, prior SET exposure, and familiarity with SLD. Section II comprised 20 items assessing SLD awareness and knowledge: eight items on SLD awareness and 12 items on knowledge of dyslexia, dysgraphia, and dyscalculia. Responses were recorded on a 4-point Likert scale (1=strongly disagree; 4=strongly agree), without a neutral option. Two negatively worded items were reverse coded to ensure uniform score direction. The awareness and the knowledge score were calculated for each GPS teacher by summing their response to each item, with a maximum possible score of 32 (8 items×4 points) and 48 (12 items×4 points), respectively. Internal consistency was assessed using Cronbach's alpha for awareness (α=0.82) and knowledge (α=0.78) subscales.

Administrative permission was obtained from the District Collector and Chief Educational Officer, Department of Education, followed by approval from each participating school's Headmaster. Teachers were assembled in a quiet room where the study purpose, procedures, and confidentiality safeguards were explained. Written informed consent was obtained from all participants.

Questionnaires were administered in English or Tamil based on participant preference and collected after 20-25 minutes. No personal identifiers were collected. The questionnaire was self-administered and anonymous to reduce social desirability bias. Questionnaires with any incomplete response were excluded from the final analysis. No imputation was performed.

Percentile ranks were computed separately for awareness and knowledge scores. Participants scoring below the 25th percentile were categorized as having relatively lower awareness or knowledge [Lower quartile (LQ)], while those scoring at or above the 25th percentile were categorized as higher quartile (HQ). The 25th percentile was selected as the lower-quartile threshold to identify teachers with relative deficits compared to the study cohort, consistent with norm-referenced educational assessment practice.

This approach was chosen in the absence of an established criterion-referenced passing standard for SLD awareness in primary school teachers in India. Item-level and domain-wise analyses examined areas with higher proportions of LQ scores.

Data were entered into Microsoft excel (365 version) and analyzed using SPSS (version 16). Categorical variables were summarized as frequencies and percentages, continuous variables as mean and standard deviation (SD). Associations between GPS teacher's characteristics and LQ awareness or knowledge were examined using chi-square tests, with results expressed as odds ratio (OR) and 95% confidence intervals (CI). All tests were two-tailed with statistical significance set at $p<0.05$.

RESULTS

During the study period, 228 rural GPS teachers were approached for participation; of them, 223 (response rate 97.8%) consented to participate. During the questionnaire completion phase, 3 teachers withdrew due to administrative-related calls, thus yielding a final 220 teachers' responses, which were included for analysis. (Figure 1). There was no missing data.

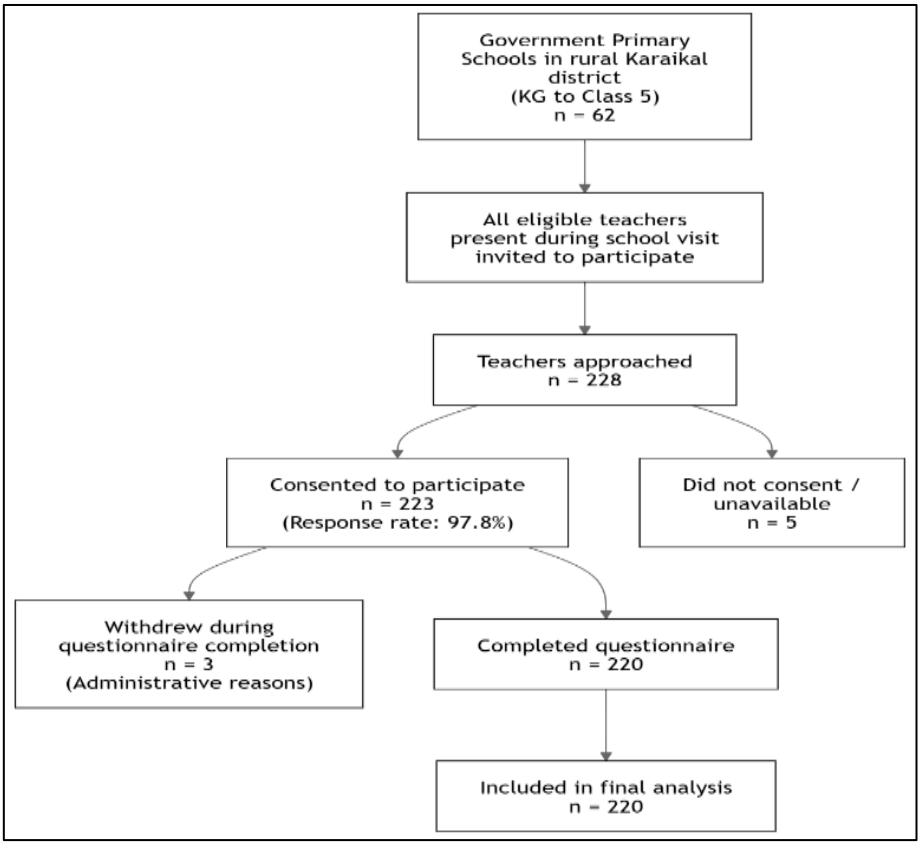

Figure 1: Study flow diagram.

The GPS teacher's socio demographic profile was summarised in Table 1. The mean age of the GPS teachers was 39.2 years (Standard deviation 6.5 years, range 22-58 years), and the male to female ratio is 1:4.

Among the 220 teachers, 66 (30.0%) reported having received some form of SET, either as pre-service training (n=24) or in-service training (n=10), including online certificate courses (n=32). Only 41 (out of 66) teachers reported that they had exposure to effective remedial teaching techniques during SET. The common sources of awareness about SLD were books and journals (113: 51.4%), followed by social media (28; 12.9%) and colleagues (23; 10.5%).

Using the predefined 25th percentile cut-offs, 46 teachers (20.9%) were classified as having lower-quartile (LQ) awareness scores (<23/32), while 53 teachers (24.1%) were classified as having lower-quartile (LQ) knowledge scores (<30/48). Domain-wise analysis among 53 LQ knowledge scored teachers revealed that deficits were most frequently observed in dyslexia-related concepts (22; 41.5%), followed by dysgraphia (20; 37.7%) and dyscalculia (11; 20.8%). Individual item wise description of GPS teachers' responses to awareness and knowledge questionnaires is shown Figure 2.

Table 2 shows the comparison between the awareness and knowledge quartiles (LQ vs HQ) scores of the GPS teachers. The receipt of SET and previous experience of teaching children with SLD were significantly associated with the lower odds of LQ awareness and knowledge scored by teachers.

The teachers' willingness for future SET demonstrated a predominance of agreement responses across both knowledge groups (Figure 3).

Table 1: Descriptive characteristics of the GPS teachers, (n=220).

Characteristics	N	Percentage
Age group (in years)		
21-30	6	(2.7 %)
31-40	147	(66.8 %)
41-50	46	(20.9 %)
51-60	21	(9.5 %)
Gender		
Male	44	(20 %)
Female	176	(80 %)
Highest grade of students whom the teacher handles		
Kindergarten to class 3	69	(31.4 %)
Class 4 and 5	151	(68. 6 %)
Total years of experience in teaching primary school students		
Less than 15 years	136	(61.8 %)
More than 15 years	84	(38.2 %)
Highest level of professional qualification attained by the teacher		
Bachelor of education (B. Ed)	93	(42.3 %)
Master of education (M. Ed)	127	(57.7 %)

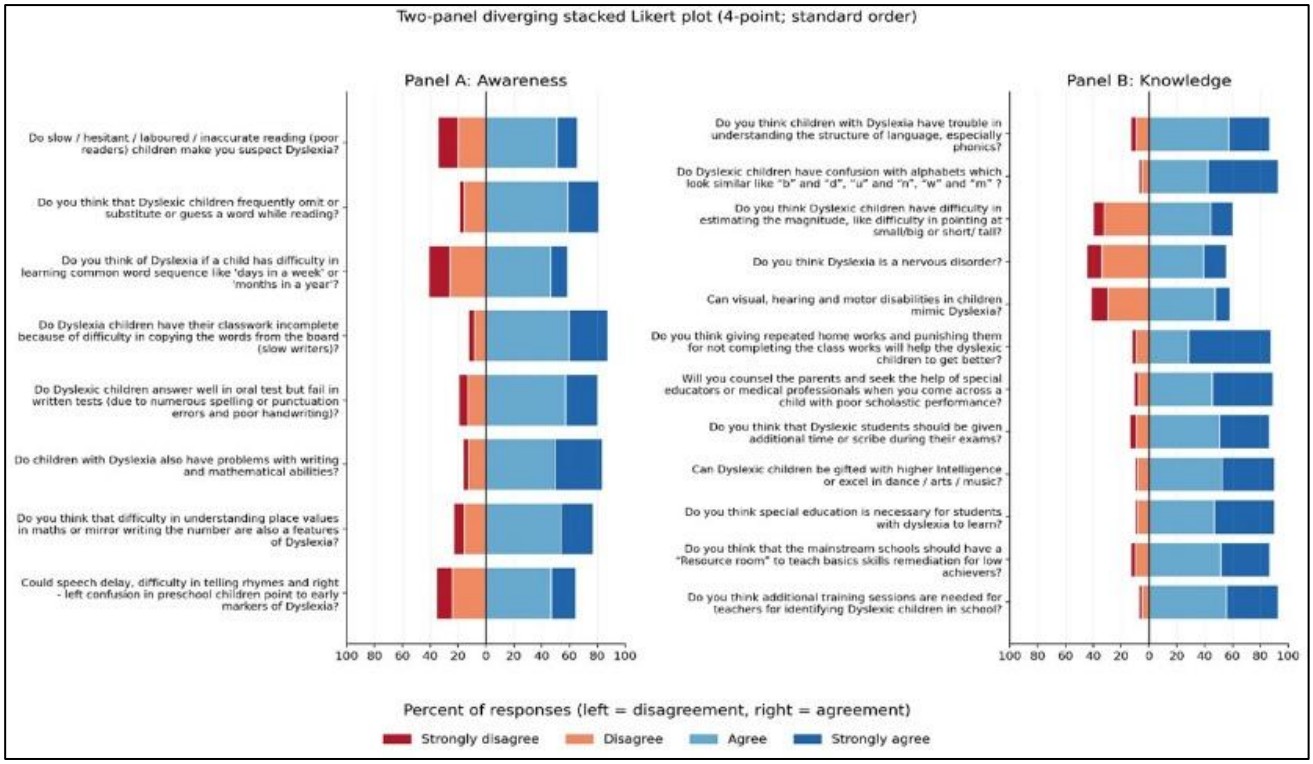

Figure 2: Item-wise distribution of teachers' awareness and knowledge regarding SLD on a 4-point Likert scale.

Table 2: Factor associated with lower quartile awareness and knowledge scores.

Factor	Awareness				Knowledge			
	LQ score group, (n=46) (%)	HQ score group, (n=174) (%)	OR (95% CI)	P value	LQ score group, (n=53) (%)	HQ score group, (n=167) (%)	OR (95% CI)	P value
Age group (in years)								
≤35	7 (15.2)	40 (23)	1.66 (0.69-4.00)	0.252	13 (24.5)	34 (20.4)	0.79 (0.38-1.63)	0.518
>35	39 (84.8)	134 (77)			40 (75.5)	133 (79.6)		
Gender								
Male	7 (15.2)	37 (21.3)	1.50 (0.62-3.64)	0.361	14 (26.4)	30 (18)	0.61 (0.29-1.26)	0.180
Female	39 (84.8)	137 (78.7)			39 (73.6)	137 (82)		
Highest degree obtained								
B. Ed	14 (30.4)	79 (45.4)	1.90 (0.95-3.81)	0.067	18 (34)	75 (44.9)	1.59 (0.83-3.02)	0.159
M. Ed	32 (69.6)	95 (54.6)			35 (66)	92 (55.1)		
Level of teaching								
KG to 3rd STD	14 (30.4)	55 (31.6)	1.06 (0.52-2.14)	0.878	16 (30.2)	53 (31.7)	1.08 (0.55-2.10)	0.832
4th and 5th std	32 (69.6)	119 (68.4)			37 (69.8)	114 (68.3)		
Teaching experience group (in years)								
≤15	27 (58.7)	109 (62.6)	1.18 (0.61-2.29)	0.624	32 (60.4)	104 (62.3)	1.08 (0.58-2.04)	0.804
>15	19 (41.3)	65 (37.4)			21 (39.6)	63 (37.7)		
Received any special training								
Yes	20 (43.5)	46 (26.4)	0.47 (0.24-0.92)	0.024*	25 (47.2)	51 (30.5)	0.49 (0.26-0.93)	0.025*
No	26 (56.5)	128 (73.6)			28 (52.8)	116 (69.5)		
Previous experience in teaching Dyslexic child								
Yes	14 (30.4)	87 (50)	0.44 (0.22–0.88)	0.017*	17 (32.1)	84 (50.3)	0.47 (0.24–0.90)	0.020*
No	32 (69.6)	87 (50)			36 (67.9)	83 (49.7)		

*p<0.05 statistically significant

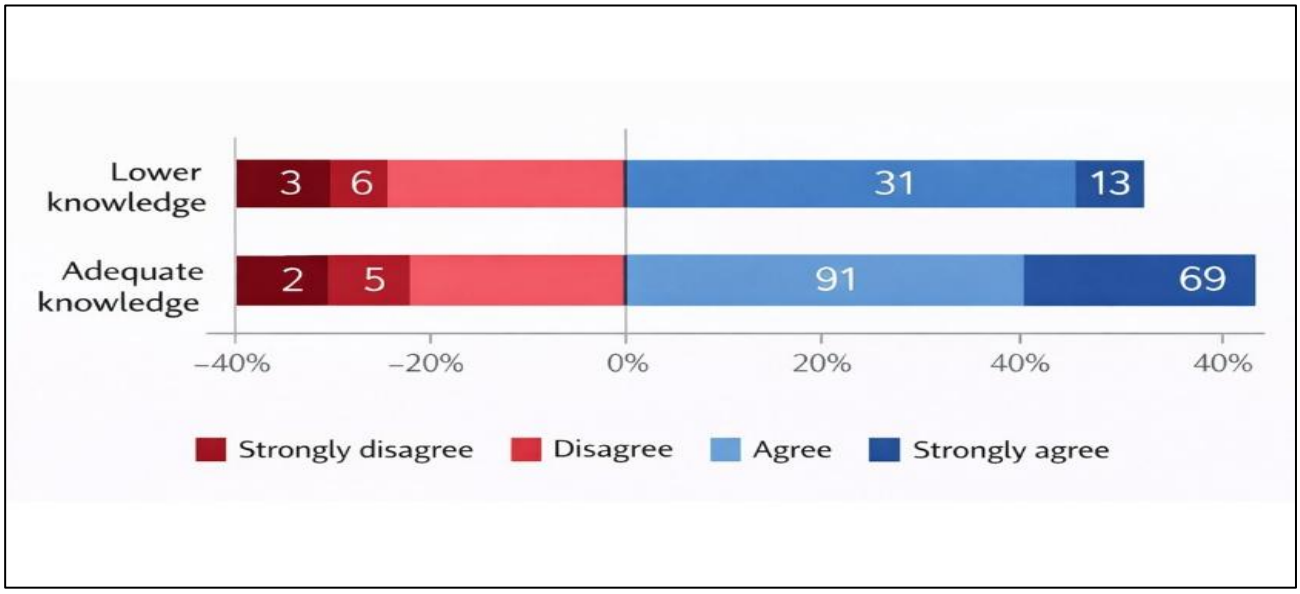

Figure 3: Teachers' willingness to participate in future SET, stratified by knowledge competency level (LQ vs. HQ).

DISCUSSION

The GPS teachers' participation with exceptionally high response rate of 97.8%, with minimal attrition, reflects their strong professional engagement and an intrinsic interest in developmental conditions such as SLD. This level of participation indicates institutional trust and professional "buy-in," consistent with findings from earlier Indian studies involving government school teachers.[16] High engagement is particularly relevant in rural settings, where competing academic and administrative responsibilities often limit participation in research and training.

The demographic profile of the cohort further strengthens the relevance of the findings. The teachers were predominantly mid-career educators, with a mean age of 39.2 years with nearly two-third belonging to the 31-40-

year age group. This combination of foundational teaching experience with sufficient career longevity will be helpful in sustaining long-term outcomes. Such a profile aligns well with the National Education Policy (NEP) 2020, which envisages sustained systemic reform rather than short-term interventions.[9] The marked female predominance, with a male-to-female ratio of 1:4, mirrors the feminization of primary education observed universally. Previous studies suggest that female teachers often facilitate greater approachability and communicability with young children and parents, particularly during early identification of learning difficulties.[18]

This demographic characteristic may facilitate school-based screening and early referral processes in rural contexts. More than half the cohort held postgraduate qualifications with mean teaching experience exceeding a decade, suggesting substantial latent capacity to recognize and respond to SLD provided appropriate training is delivered. The predominance of teachers handling grades 4 and 5 is especially relevant from a pediatric developmental perspective, as these grades represent the critical period when persistent literacy and numeracy difficulties become clinically apparent and referral pathways can meaningfully alter developmental trajectories.

The findings are most directly applicable to rural GPS settings in this district. Cautious extrapolation to other South Indian rural districts is supported by alignment with UDISE+ 2022-23 national patterns, though independent validation in other states is recommended before wider policy application.[19,20]

Despite these favorable characteristics, only 30% of teachers reported receiving any SET, and among those trained, exposure to effective remedial strategies was inconsistent. Formal training programs and online courses were among the least frequently cited awareness sources, indicating that limited access to structured, domain-specific professional development-rather than lack of motivation/capability-remains principal constraint to effective school-based identification in rural settings.

The proportion of teachers demonstrating HQ awareness (79%) and knowledge (76%) exceeded rates reported in several earlier Indian studies, likely reflecting experiential learning from direct classroom exposure to children with dyslexia and prior SET in a subset of teachers.[14,15,18]

Domain-wise analysis revealed important deficiencies. Knowledge gaps were most pronounced in foundational dyslexia concepts, followed by dysgraphia and dyscalculia. These findings point out a critical limitation in existing teacher training approaches, where focus is on certain domains at the expense of other domains of SLD, despite their formal recognition in diagnostic frameworks.[14,15] From a pediatric perspective, such selective knowledge gaps may delay recognition of non-reading-dominant presentations, contributing to late referrals and secondary emotional or behavioral difficulties. Incorporation of linguistically appropriate assessment tools, such as the dyslexia assessment for the languages of India (DALI), into teacher training may enhance early risk identification in multilingual rural settings.[21]

Formal SET emerged as a key modifiable determinant of teacher competency similar to other Indian studies.[15,16] Early school-based identification may reduce diagnostic delays and burden on specialist services. It can be supported through integration of SET into existing primary care platforms rather than creating a parallel program. Experiential learning further amplified competency. This finding underscores the frequently "invisible" nature of SLD in classroom settings and supports peer-led capacity-building models, such as inclusion mentor frameworks to translate theoretical knowledge into practical classroom skills.[9,10] The near-universal willingness of teachers to participate in future SET provides a strong foundation for scalable implementation of training programs for teacher capacity building.[19,22-24]

Methodological strengths include in-person universal sampling across all 62 eligible schools, use of a locally translated and internally validated tool, and a high response rate (97.8%). Limitations include: (1) reliance on self-reported data, which may overestimate actual awareness due to social desirability bias; (2) the cross-sectional design precludes causal inference between training exposure and competency; (3) use of a distribution-based 25th percentile cut-off identifies relative rather than absolute deficits; and (4) convenience sampling of teachers present on the day of the visit may under-represent those with heavier administrative workloads.

Future qualitative and longitudinal studies are suggested to examine contextual barriers and to evaluate the sustained impact of structured training on screening accuracy and student outcomes.

CONCLUSION

This study highlights that a substantial proportion of rural GPS teachers demonstrate relative gaps in awareness and knowledge of SLD, particularly in dyslexia-related concepts, despite their high professional engagement and academic qualifications. Receipt of SET and prior experiential exposure were consistently associated with better competency, identifying these as modifiable determinants. Given the important role of primary school teachers in early recognition of learning difficulties and the constraints on specialist services in resource-limited settings, strengthening teacher capacity within existing school-linked platforms may support earlier identification of children with suspected SLD. Integration with existing

school and primary care systems may facilitate earlier identification, referral, and follow-up. Further longitudinal studies are needed to assess whether improvements in teacher competency translate into earlier pediatric referral and improved child-level outcomes.

ACKNOWLEDGMENTS

The authors sincerely thank the District Collector, Karaikal, and the Chief Educational Officer, Karaikal, Puducherry Union Territory, for granting permission and facilitating the conduct of the study in government primary schools across the district. The authors gratefully acknowledge Dr. Vigneshvar Chandrasekaran, MD, Professor, Mahatma Gandhi Medical College and Research Institute, Puducherry, and Dr. Avin Muthuramalingam, MD, DNB, Assistant Professor, Indira Gandhi Medical College and Research Institute, Puducherry, for their expert inputs and assistance in the development and content validation of the study questionnaire. The authors also express their sincere gratitude to Mrs. Krishnaveni, Government School Teacher, Karaikal, for her valuable assistance in the Tamil translation of the questionnaire and in evaluating its face validity, linguistic clarity, and contextual appropriateness for the study population. The authors are especially grateful to all the government primary school teachers who participated in the study and generously shared their time and perspectives.

Funding: Funding sources Indian Council of Medical Research (ICMR) Short Term Studentship program.
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Faruk T, King C, Muhit M, Islam MK, Badawi N, Khandaker G. Screening tools for early identification of children with developmental delay in low- and middle-income countries: a systematic review. BMJ Open. 2020;10(11):e038182.
2. Rao S, Raj S, Ramanathan V, Sharma A, Dhar M, Thatkar P. Prevalence of dyslexia among school children in Mysore. Int J Med Sci Public Health. 2017;6(1):159-64.
3. Karande S, Bhosrekar K, Kulkarni M, Thakker A. Health-related quality of life of children with newly diagnosed specific learning disability. J Trop Pediatr. 2009;55(3):160-9.
4. Durand VM. Disorders of development. In: Barlow DH, editor. The Oxford handbook of clinical psychology. Oxford: Oxford University Press. 2014.
5. Ministry of Social Justice and Empowerment. Guidelines for the purpose of assessing the extent of specified disability under the Rights of Persons with Disabilities Act, 2016. New Delhi: Department of Empowerment of Persons with Disabilities. 2018. Available at: https://divyangjan.depwd.gov.in/upload/uploadfiles/assessment_guidelines.pdf. Accessed on 29 April 2026.
6. Scaria LM, Bhaskaran D, George B. Prevalence of specific learning disorders among children in India: a systematic review and meta-analysis. Indian J Psychol Med. 2023;45(3):213-9.
7. Langer N, Peysakhovich B, Zuk J, Drottar M, Sliva DD, Smith S, et al. White matter alterations in infants at risk for developmental dyslexia. Cereb Cortex. 2017;27(2):1027-36.
8. Karande S, Kulkarni M. Specific learning disability: the invisible disability. Indian J Pediatr. 2022;89(1):89-96.
9. Ministry of Education. National Education Policy 2020. New Delhi: Government of India. 2020.
10. UNESCO. Inclusive education in India: policies, practices, and challenges. Paris: UNESCO. 2021.
11. Lyon G, Weiser B. Teacher knowledge, instructional expertise, and the development of reading proficiency. J Learn Disabil. 2009;42(5):475-80.
12. Fletcher J, Francis D, Foorman B, Schatschneider C. Early detection of dyslexia risk: development of brief, teacher-administered screens. Learn Disabil Q. 2021;44(3):145-57.
13. Menon KPS. Awareness on learning disabilities among elementary school teachers. Asian J Educ Train. 2016;2(2):78-83.
14. Hemadharshini S, George N, Malaidevan E, Britto R, George M. Dyslexia: Literacy among school teachers in Perambalur,Tamil Nadu, India. Int J Med Health Dev. 2020;25:101-5.
15. Jaya Lakshmi P, Rao A, Mathew Nishanth A, Krishna Prasanth B, Aravindha Babu N. Dyslexia awareness among school teachers. Indian J Public Health Res Dev. 2019;10(11):2865.
16. Madhamani P, Joseph N. Knowledge and awareness about learning disabilities among public school teachers in Dharmapuri district, Tamil Nadu. J Fam Med Prim Care. 2021;10(6):2524-9.
17. Jebakumar R, Ravindran P, Christopher P, Rajan S. Awareness and knowledge of learning disabilities among government and private school teachers in Vellore district, Tamil Nadu. J Fam Med Prim Care. 2023;12(8):1582-8.
18. Lingeswaran A. Assessing the knowledge of primary school teachers on specific learning disabilities in two schools in Puducherry. J Educ Health Promot. 2013;2:30.
19. Department of School Education and Literacy. National Initiative for Proficiency in Reading with Understanding and Numeracy (NIPUN Bharat): mission guidelines. New Delhi: Ministry of Education. 2021.
20. Ministry of Education. UDISE+ 2023-24: Unified District Information System for Education Plus. New Delhi: Department of School Education and Literacy; 2024. Available at: https://www.education.gov.in/sites/upload_files/mhrd/files/statistics-

new/udise_report_existing_23_24.pdf. Accessed on 29 April 2026.
21. Singh NC. Dyslexia Assessment for Languages of India (DALI). Manesar: National Brain Research Centre. 2015. Available at: http://www.nbrc.ac.in/faculty/nandini/dali.php. Accessed on 29 April 2026.
22. Ministry of Education. NISHTHA: National Initiative for School Heads' and Teachers' Holistic Advancement-guidelines. New Delhi: Government of India; 2019. Available at: https://scert.delhi.gov.in/sites/default/files/SCERT/publication%202019-20/34-nishtha_leadership_package.pdf. Accessed on 29 April 2026.
23. National Council of Educational Research and Training (NCERT). NISHTHA training modules: inclusive education and learner-centred pedagogy. New Delhi: NCERT; 2020. Available at: https://ciet.ncert.gov.in/nishtha. Accessed on 29 April 2026.
24. National Council of Educational Research and Training (NCERT). PRASHAST: a disability screening checklist for schools. New Delhi: Central Institute of Educational Technology, NCERT; 2024. Available at: https://ciet.ncert.gov.in/prashast. Accessed on 29 April 2026.

Cite this article as: Sajeev S, Narayanasamy DK, Tanigasalam V. Awareness and knowledge of specific learning disorder among rural primary school teachers in South India: a cross-sectional questionnaire-based study. Int J Contemp Pediatr 2026;13:1170-7.