

Current Assessment Tools, Integration, and Clinical Decision-Making in Written Language Disorder (Dysgraphia): A Pilot Study

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Abstract

Written Language Disorder (WLD), or dysgraphia, remains an underexamined component of routine speech–language evaluation in India, where culturally and linguistically appropriate assessment tools are limited. The present pilot study examined the assessment practices, integration strategies, clinical decision-making, and self-reported confidence of speech–language pathologists (SLPs) regarding WLD, and explored whether years of clinical experience influence these parameters. A cross-sectional survey was completed by 48 practicing SLPs in India, stratified into three experience cohorts: less than 1 year, less than 5 years, and more than 5 years. Participants completed two Likert-scale subscales and six categorical items. Data were analyzed using chi-square tests and Kruskal–Wallis ANOVA, with Dwass–Steel–Critchlow–Fligner post hoc comparisons. Use of informal writing tasks differed significantly across cohorts, with less-experienced SLPs using such tasks less frequently than more experienced peers; use of formal standardized tools also differed across cohorts on the chi-square test. Other domains did not differ significantly. Categorical findings revealed that 54.2% identified lack of standardized Indian tools as the major barrier, and 12.5% reported omitting written language assessment because they considered oral language to be more important. Endorsement of the need for standardized Indian guidelines was near-unanimous. These findings indicate that standardized, locally validated assessment of dysgraphia remains an unmet need in Indian speech–language pathology and underscore the need for context-specific tool development and clinical training.

Keywords: dysgraphia, written language disorder, speech–language pathologists, assessment practices, clinical decision-making, India

INTRODUCTION

Written language is a complex, late-developing skill that integrates oral language, orthographic knowledge, working memory, executive function, and graphomotor coordination (Berninger & Wolf, 2009; Graham, 2018). When this acquisition is disrupted, the resulting profile is described as WLD, with dysgraphia commonly denoting impairments in written text production not better explained by intellectual

disability, sensory impairment, or inadequate instruction (American Psychiatric Association [APA], 2022; Döhla & Heim, 2016). WLD involves a significant impairment in fluent word reading (i.e., reading decoding and sight word recognition), reading comprehension, written spelling, and/or written expression (American Speech-Language-Hearing Association [ASHA], n.d). Although reading disorders have received sustained attention, dysgraphia remains the less examined member of the specific learning disorders, and its assessment within speech–language pathology continues to be variable and under-protocolized (Berninger et al., 2015; McCloskey & Rapp, 2017).

ASHA (2016) includes the assessment and treatment of reading and writing within the SLP’s scope of practice: as specialists in the language substrate that underlies written expression, they are uniquely positioned to differentiate linguistically based writing difficulties from purely graphomotor or educational concerns, and to coordinate referrals across allied professionals. Comprehensive WLD evaluation typically spans graphomotor production, orthographic and spelling skills, and higher-order written expression at the word, sentence, and discourse levels (Berninger & Wolf, 2009; Troia, 2014), and best-practice models emphasize interpreting written language findings alongside oral language data, given the substantial overlap with developmental language disorder (Bishop & Snowling, 2004; Sumner & Connelly, 2020).

Despite these recommendations, the international literature documents marked heterogeneity in clinical practice, including limited use of standardized writing batteries and inconsistent integration of written language data into diagnostic formulations (Blood et al., 2010; Mason & Graham, 2008). In low- and middle-income settings, these challenges are compounded by the scarcity of culturally and linguistically appropriate assessments. Most widely cited writing batteries have been developed and normed on monolingual English-speaking populations, and their direct application to multilingual Indian children where bi- and tri-literacy across distinct orthographies is the norm, raises significant validity concerns (Karanth, 2003; Nag, 2007, 2014).

Need of the Study

Written language assessment remains under-prioritized in Indian speech-language pathology practice, with no systematic data on how SLPs evaluate dysgraphia, integrate findings, or perceive available tools. Existing assessments are largely normed on monolingual English-speaking populations, leaving clinicians without culturally and linguistically appropriate instruments for India's multilingual, multiscript caseloads. This study addresses that evidence gap by profiling current practices and identifying the training and policy priorities needed to support evidence-based identification of dysgraphia.

METHOD

Aim

The present pilot study aimed to investigate current assessment practices, integration strategies, and clinical decision-making among Indian SLPs in WLD assessment, and examined the influence of clinical experience on these parameters.

Study Design

A cross-sectional, questionnaire-based pilot survey design was adopted. All procedures were conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Declaration of Helsinki and its later amendments. Electronic informed consent was obtained from each participant prior to questionnaire administration.

Procedure

The present study was carried out in two phases

Phase 1: Preparation of questionnaire

A structured questionnaire was developed to assess clinical practices, integration, decision-making, and perceived needs related to WLD assessment, and was validated by five practicing SLPs for item relevance, clarity, and comprehensiveness. Subscale 1 (Clinical Practices, Integration, and Clinical Decision-Making) included nine items rated 1 = *never* to 5 = *always*, covering use of formal and informal tools, evaluation of graphomotor, orthographic/spelling, and written expression domains, integration with other language domains, diagnostic formulation, and referral decisions. Subscale 2 (Confidence, Training, and Needs) included three items rated 1 = *strongly disagree* to 5 = *strongly agree*, assessing self-reported confidence in WLD assessment, perceived adequacy of culturally and linguistically appropriate tools in India, and the need for standardized Indian guidelines.

Phase 2: Participants

A total of 48 practicing SLPs participated in the study. Participants were recruited through professional networks, institutional mailing lists, and social media platforms targeting Indian speech–language pathology professionals, using non-probability convenience sampling. Participants were stratified by self-reported years of clinical experience into three cohorts: less than 1 year ($n = 17$; 35.4%), less than 5 years ($n = 22$; 45.8%), and more than 5 years ($n = 9$; 18.8%; see Table 1). This stratification served as the grouping variable for all between-group comparisons.

Statistical Analysis

Data were analyzed using jamovi Version 2.4.8 (The jamovi project, 2023). Item and domain-level composite scores (mean of constituent items) were summarized with descriptive statistics for each experience cohort. Because Likert data were ordinal and non-normally distributed, Pearson's chi-square test examined the association between experience cohort and response distribution, and the Kruskal–Wallis test compared median ranks across cohorts. Significant Kruskal–Wallis results were followed by Dwass–Steel–Critchlow–Fligner (DSCF) post hoc comparisons. A two-tailed alpha of .05 was adopted throughout.

RESULTS AND DISCUSSION

The current pilot study included 48 practicing SLPs to investigate current assessment practices, integration techniques, clinical decision making along with confidence, training and needs on WLD (Dysgraphia).

Table 1 Participant Distribution by Years of Clinical Experience ($N = 48$)

Experience cohort	<i>N</i>	%	<i>Cumulative %</i>
Less than 1 year	17	35.4	35.4
Less than 5 years	22	45.8	81.3
More than 5 years	9	18.8	100.0
Total	48	100.0	—

As shown in Table 1, the largest cohort comprised clinicians with less than 5 years of experience ($n = 22$;

45.8%), followed by those with less than 1 year of experience ($n = 17$; 35.4%); the smallest cohort comprised clinicians with more than 5 years of experience ($n = 9$; 18.8%).

Inferential statistics for all Likert items are presented in Tables 2. Routine inclusion of written language evaluation did not differ across experience cohorts ($p = .316$). Use of formal standardized tools showed a significant association with experience on the chi-square test ($p = .046$) but only a non-significant trend on the Kruskal–Wallis test ($p = .067$), with use highest among clinicians with more than 5 years of experience.

Use of informal writing tasks was the only item to show a robust group difference ($p = .028$ chi-square; $p = .012$ Kruskal–Wallis). Post hoc comparisons for Use of Informal Writing Tasks (Table 3) localized the effect to the contrast between the < 1 -year and < 5 -year cohorts ($p = .014$); comparisons involving the > 5 -year cohort did not reach significance, likely reflecting limited power in that subgroup. Assessment of graphomotor, orthographic, and written expression domains did not differ across cohorts (all $ps > .19$), and the composite Current Assessment Practices score was also non-significant ($p = .420$; Figure 1, Panel A).

Among the 48 respondents, 45 specified an assessment tool. The most frequently named instruments were the Early Literacy Skills Assessment Tool (ELSAT; $n = 8$; 17.8%), Dyslexia Assessment Profile for Indian Children (DAPIC; $n = 6$; 13.3%), the Western Aphasia Battery (WAB; $n = 6$; 13.3%), and the Test of Written Language—Fourth Edition (TOWL–4; $n = 6$; 13.3%), followed by the Dyslexia Assessment for Languages of India (DALI; $n = 4$; 8.9%). Notably, six respondents (13.3%) reported not having used any formal tool, and five (11.1%) relied exclusively on self-developed informal procedures. Several respondents reported using oral-language batteries (e.g., WAB, CELF–5) as proxies for written language assessment—a substitution that highlights the absence of widely available, dysgraphia-specific tools normed for Indian populations.

Integration of written language assessment with other language domains did not differ across cohorts ($p = .954$ chi-square; $p = .773$ Kruskal–Wallis), nor did the perceived influence of written language findings on diagnosis ($p = .423$; $p = .189$), or on referral decisions ($p = .669$; $p = .689$). The composite Integration and Clinical Decision-Making scores were also non-significant ($p = .494$ and $p = .689$, respectively; Figure 1, Panels B and C).

Self-reported confidence increased descriptively with experience but did not reach significance ($p = .103$). Perceptions of culturally and linguistically appropriate tool availability were uniformly negative across cohorts ($p = .071$ chi-square; $p = .865$ Kruskal–Wallis), and endorsement of the need for standardized Indian guidelines was near-unanimous ($p = .194$). The composite Confidence, Training, and Needs domain did not differ across cohorts ($p = .107$; Figure 1, Panel D).

Table 2 Chi-Square and Kruskal–Wallis Tests Comparing Experience Cohorts on Item- and Domain-Level Scores

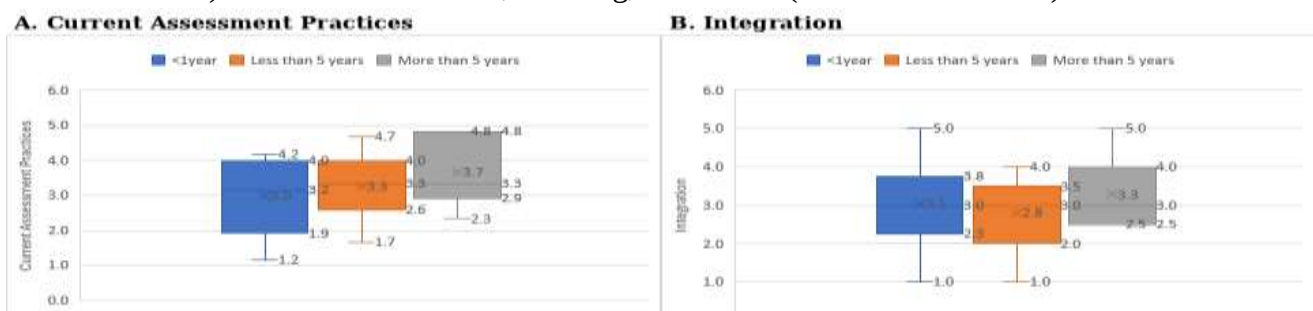
Item/Domain	Chi-square test			Kruskal–Wallis test			Significance
	χ^2	df	p	H	df	p	
I assess WL skills as part of routine SLP evaluation	9.33	8	.316	1.34	2	.512	NS

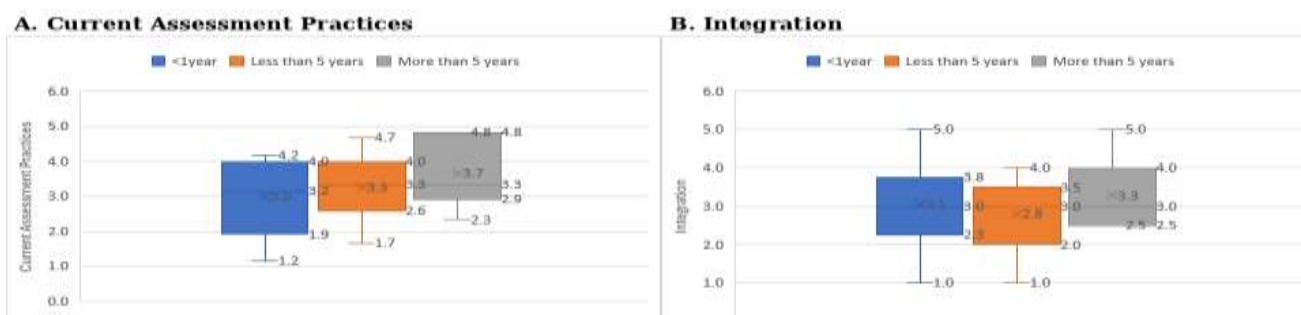
Item/Domain	Chi-square test			Kruskal–Wallis test			Significance
	χ^2	df	p	H	df	p	
I use formal standardized tools for assessing WLD	15.77	8	.046*	5.41	2	.067	S
I use informal writing tasks	14.15	6	.028*	8.89	2	.012*	S
I assess handwriting/graphomotor aspects	5.99	8	.649	1.68	2	.432	NS
I assess spelling and orthographic skills	5.65	8	.686	3.29	2	.193	NS
I assess written expression	6.74	8	.565	1.50	2	.473	NS
<i>Domain: Current Assessment Practices</i>	—	—	—	1.74	2	.420	NS
Integrate WLA with other language domains	2.65	8	.954	0.52	2	.773	NS
WL findings influence diagnosis	8.11	8	.423	3.33	2	.189	NS
<i>Domain: Integration</i>	—	—	—	1.41	2	.494	NS
WL outcomes influence referral decisions	5.81	8	.669	0.75	2	.689	NS
<i>Domain: Clinical Decision-Making</i>	—	—	—	0.75	2	.689	NS
Confident in assessing WLD	— ^a			4.54	2	.103	NS
Sufficient culturally/linguistically appropriate tools	14.43	8	.071	0.29	2	.865	NS
Need for standardized Indian guidelines	7.76	6	.256	3.28	2	.194	NS
<i>Domain: Confidence, Training, and Needs</i>	—	—	—	4.47	2	.107	NS

HS – Highly Significant, S – Significant, NS – Not Significant

Figure 1

Composite Domain Scores by Experience Cohort: Panel A: Current Assessment Practices (mean of six items). Panel B: Integration (mean of two items). Panel C: Clinical Decision-Making (single item on referral influence). Panel D: Confidence, Training, and Needs (mean of three items)





As shown in Figure 1, median composite scores rose gradually from the < 1-year to the > 5-year cohort across all four domains, with the clearest upward shift in Current Assessment Practices (Panel A) and Confidence, Training, and Needs (Panel D). Integration (Panel B) showed the flattest, least orderly progression, while Clinical Decision-Making (Panel C) was uniformly high across cohorts. However, the boxes overlap substantially in every panel and interquartile ranges are wide particularly in the < 1-year group consistent with the non-significant Kruskal–Wallis results (all $ps > .10$). Experience appears to nudge practice in the expected direction, but within-cohort variability is too large for experience alone to reliably distinguish how Indian SLPs approach written-language assessment.

Table 3

Post Hoc Analysis: Dwass–Steel–Critchlow–Fligner Pairwise Comparisons for Use of Informal Writing Tasks

Group 1	Group 2	<i>W</i>	<i>P</i>	Significance
< 1 year	< 5 years	3.95	.014*	S
< 1 year	> 5 years	2.95	.093	NS
< 5 years	> 5 years	−0.70	.873	NS

HS – Highly Significant, S – Significant, NS – Not Significant

Contextual and Categorical Findings

Six categorical items captured the contexts of written language assessment inclusion or omission, perceived barriers, diagnostic criteria, and the relative weight of oral versus written language. Three patterns stand out. First, the most frequent reasons for omitting WLA were age-related cooperation issues in younger children (56.3%) and time/caseload constraints (20.8%); a smaller subset omitted WLA because they considered oral language more diagnostically important (12.5%).

Second, the lack of standardized Indian tools was the most frequently identified barrier to integrating WLA (54.2%), followed by limited training (22.9%) and time pressures (14.6%) — converging directly with the Likert findings on inadequate culturally appropriate tools and unmet need for Indian guidelines.

Third, diagnostic decision-making was multi-criterion, anchored most often on a discrepancy between oral and written language and on writing output that lagged age/grade expectations (62.5%). Half of respondents rated oral and written language as equally important during diagnosis. Smaller minority (12.5%) continued to prioritize oral language over written language and only 4.2% prioritized written language.

DISCUSSION

The current pilot study characterized assessment practices, integration, decision-making, and confidence of Indian SLPs evaluating WLD across experience cohorts. Four findings stand out: (a) practices were broadly consistent across cohorts, except for informal writing-task use; (b) formal standardized assessment remains underused with marked tool heterogeneity; (c) culturally appropriate tools are widely seen as inadequate and Indian guidelines as needed; and (d) a sizable minority continue to prioritize oral over written language during diagnosis.

Informal writing-task use increased with experience, with < 1-year clinicians reporting significantly less use than the < 5-year cohort ($p = .014$). Informal procedures presuppose familiarity with developmental milestones, error analysis, and curricular expectations that accrue with practice (Berninger et al., 2015; Troia, 2014), reflecting methodological expansion through experience rather than an early-training deficit. Formal standardized tool use showed a parallel but weaker pattern (chi-square significant; Kruskal–Wallis $p = .067$) and remained low across all cohorts. Respondents named a wide range of tools, several being oral-language batteries repurposed as written-language proxies. This converges with international observations of underuse (Blood et al., 2010; Mason & Graham, 2008), but shows that in India, experience does not translate into routine standardized assessment — reflecting limited locally validated batteries rather than clinician preference.

Written language findings drove referrals more than diagnostic formulation, and this did not improve with experience. Categorical data illuminate the mechanism: subsets of respondents both omitted WLA and ranked oral language as more diagnostically important. This asymmetry — referring outward without anchoring diagnosis within speech–language pathology — may reflect a residual view of dysgraphia as an educational or psychological concern rather than a language-based disorder within the SLP scope, at odds with ASHA (n.d.) and current spoken–written continuum models (Berninger & Wolf, 2009; Sumner & Connelly, 2020).

The descriptive rise in confidence with experience did not reach significance, likely due to limited power in the > 5-year cohort. More striking are the cohort-invariant floor-level ratings of tool adequacy and ceiling-level endorsement of Indian guidelines, reflecting not a null result but a workforce-wide consensus on a system-level gap (Karanth, 2003; Nag, 2007, 2014).

SUMMARY AND CONCLUSION

The current pilot study provides the first systematic snapshot of dysgraphia assessment among Indian SLPs. Routine inclusion of written language evaluation is moderate and largely uniform across experience cohorts. Formal standardized assessment of WLD is consistently underused, with marked tool heterogeneity and only a non-significant upward trend with experience. The use of informal writing tasks increases significantly with experience, suggesting that procedural fluency is acquired through practice rather than initial training alone. Most consequentially, more than half of the respondents identified lack of standardized Indian tools as the major barrier to integrating written language assessment, and the workforce-wide consensus on the need for standardized Indian guidelines is unmistakable. Coordinated investment in clinician training, integration of written language assessment into the core SLP diagnostic process, and the development of psychometrically sound, locally normed assessment tools is urgently required.

Limitations

Small sample size.

Use of convenience sampling.

Future directions

Conduct a nationally stratified, fully powered survey across settings, regions, and languages of practice. Develop and norm Indian-language, script-specific dysgraphia assessment tools and accompanying clinical practice guidelines.

Use qualitative methods to unpack the diagnostic–referral asymmetry and identify targeted training needs.

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