Research Article

Developmental Language Disorder Terminology: A Survey of Speech-Language Pathologists’ Use and Knowledge

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ABSTRACT

Purpose: Developmental language disorder (DLD) is a relatively new, internationally promoted term to describe individuals with language impairments not secondary to a biomedical condition. This study aimed to better understand speech-language pathologists’ (SLPs’) current level of comfort using DLD terminology and knowledge of DLD in the United States to help SLPs better understand how and why they should consider adopting DLD terminology in their clinical practice.

Method: After completing an online presurvey to evaluate current comfort levels in using DLD terminology and current knowledge of DLD, currently practicing SLPs viewed a 45-min prerecorded educational video on DLD. Following this viewing, participants completed a postsurvey nearly identical to the presurvey to measure change in their comfort levels with DLD terminology use and in DLD knowledge.

Results: After filtering to remove likely fraudulent responders, we included 77 participants in all analyses. Presurvey Likert scale responses indicated at least some comfort in using DLD terminology. Additionally, presurvey results of true/false DLD knowledge questions revealed high variability in respondents’ knowledge of DLD. A McNemar chi-square test indicated statistically significant changes in participants’ comfort levels in using DLD terminology from pre- to postsurvey for each question. A paired t test indicated statistically significant changes in DLD knowledge from pre- to postsurvey.

Conclusion: Despite some limitations, it was concluded that diffusion efforts, such as educational presentations, are likely to increase SLPs’ comfort levels in using DLD terminology and SLPs’ knowledge of DLD.

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Through an international consensus of experts from English-speaking countries, the term developmental language disorder (DLD) has been identified for use in reference to individuals with lifelong receptive and/or expressive language difficulties that are not secondary to a biomedical condition, such as low hearing levels, traumatic brain injury, or autism (Bishop et al., 2016, 2017).

Historically, inconsistent nomenclature used to talk about child language disorders has persisted. For example, educators may label a child with “speech or language impairment,” a psychologist may diagnose a person with “language disorder,” and an insurance company may identify individuals as those with “expressive language disorder” or “expressive and receptive language disorder.” Although DLD terminology is being used internationally, its use in the United States is not well understood. Thus, the purpose of this study was to begin evaluating speech-language pathologists’ (SLPs’) comfort levels in using DLD terminology and knowledge of DLD before and after an educational presentation recorded by SLPs in the United States.
DLD and Its Impact

DLD is defined as a lifelong, neurodevelopmental condition that first presents in childhood and is characterized by difficulties in learning, understanding, and/or using spoken language that is not associated with other conditions (Bishop et al., 2017). Specific language difficulties associated with DLD change with development, but DLD persists throughout development and into adulthood. For example, at school age, children with DLD are 12 times more likely than their peers to have difficulties with reading, spelling, and math due to language difficulties (Young et al., 2002). By adulthood, individuals with DLD are 3 times more likely than their peers to experience clinical depression and 6 times more likely than their peers to experience clinical levels of anxiety (Conti-Ramsden & Botting, 2008). Despite an estimate of two children in every classroom having DLD (Norbury et al., 2016), many of these children remain undiagnosed. One likely reason for this is the history of inconsistent nomenclature surrounding child language disorders.

Choosing DLD

In 2014, the International Journal of Language & Communication Disorders issued a debate regarding the terminology used to describe children with language disorders (Reilly et al., 2014). It was found that the inconsistent terminology used to discuss children with language difficulties was creating barriers to both clinical and research progress. This debate revealed a need for international and multidisciplinary consensus regarding diagnostic criteria and labels for children with language difficulties to be used by both researchers and clinicians.

Motivated by this finding, in 2016, Bishop and colleagues (Bishop et al., 2016, 2017) began their two-phase CATALISE consortium study, which gathered experts from English-speaking countries to collaboratively propose standard criteria and terminology for identifying children who might benefit from skilled language services. Although the majority of experts were SLPs (67%), also included were psychologists (26%), pediatricians (5%), psychiatrists (2%), audiologists (2%), specialist teachers (9%), and charity representatives (7%). Countries represented included the United Kingdom (51%), Canada (14%), the United States of America (12%), Australia (11%), New Zealand (7%), and Ireland (5%). Phase 2 results indicated a consensus to use the term developmental language disorder to refer to individuals who do not have language difficulties associated with a biomedical condition; it conveys that difficulties are present at birth (developmental), impact language, and will be present for life (disorder).

Diffusion of Terminology

Despite the consensus on the term DLD, efforts need to be made to help researchers, SLPs, and other professionals to understand the terminology and how they can use it in practice. There is often a gap between research findings and clinical practice. In health care, estimates indicate that it takes 17 years for a mere 14% of original research to get translated to patient care (Balas & Boren, 2000; Green et al., 2009). Challenges that often affect the transfer of research evidence into practice for SLPs include the range and focus of research, the need for an accurate interpretation of results for use in their practice settings, and a general doubt that the findings are relevant to their individual client needs (Olswang & Prelock, 2015; Yorkston & Baylor, 2013). Without deliberate dissemination and implementation efforts, bringing scientific findings to real-world practice requires individuals to independently read, interpret, and apply findings to their work (Olswang & Prelock, 2015).

One theory of relevance that can guide the dissemination of DLD terminology and implementation by SLPs is the diffusion of innovations (DOI) theory (Rogers, 2003). The DOI theory aims to explain how, why, and at what rate new ideas spread by communication through specific populations or social systems over time. According to the DOI theory, the characteristics of an innovation influence how quickly individuals adopt innovations. These innovation characteristics include relative advantage, compatibility, complexity, trialability, and observability. When an innovation’s relative advantage is more advantageous to an individual, they are likely to adopt it more quickly. Compatibility is defined by how consistent the innovation is with an individual’s values, past experiences, and needs. The more compatible an innovation is, the faster the rate of adoption will be. Simple ideas that are easier to understand are adopted more rapidly than innovations with higher complexity and that require the development of new skills and understandings (Rogers, 2003). When innovations can be trialed (trialability; e.g., hybrid options, partial implementation), some individuals may adopt them more quickly. Last, when innovations lead to highly visible results (observability), they are more likely to be discussed among peers, and the rate of adoption is likely to be quicker.

In this study, the innovation to be diffused was DLD terminology. Although it may be relatively advantageous for SLPs to use the term DLD, evidence suggests that SLPs are not uniformly using DLD terminology. For example, in a recent study of mothers with children with low language ability, Ash et al. (2020) found that many mothers reported that they received confusing or irrelevant diagnostic labels from their child’s SLPs. Across
participants, 11 diagnostic terms were used. Ash et al. also noted that mothers indicated that a lack of a specific diagnosis by the SLP made them question if the SLP understood their child’s language condition. Similarly, in a study of caregivers with a language and/or reading disorder, Porter et al. (2020) found that caregivers were eager to receive a diagnosis. They noted that with a diagnosis, “they had something they could act upon, whether that meant using the diagnosis to request services or using it to help them understand and explain their child’s difficulties to others.” However, it is important to note that SLPs are on-the-ground experts and may have varying perceptions about whether it is advantageous to their clinical practice to use DLD terminology.

SLPs are experts in language disorders; therefore, adopting DLD terminology is compatible with their scope of practice. Although compatible, inconsistent terminology used by the many stakeholders involved in child language increases the level of complexity of this innovation. For example, although different terms are used for billing insurance and school eligibility, DLD terminology can be used to diagnose or identify individuals with DLD. Regarding trialability, this innovation is one that SLPs can try by discussing DLD with their colleagues or with parents as appropriate and as they feel comfortable doing so. Due to the extensive online resources and the DLD community online, SLPs will likely see observable results when incorporating DLD terminology into conversations with clients and their families. Innovations that have higher visibility prompt peer discussion, leading to increased rates of adoption (Rogers, 2003). Although considering the characteristics of an innovation is important in diffusion efforts, there may be other issues impacting the rate of adoption; current literature does not explore SLPs’ current use of, knowledge of, or opinions about adopting DLD terminology.

In the United States, the most prominent diffusion efforts of DLD terminology have been through published studies (e.g., Bishop et al., 2016, 2017) and articles (e.g., McGregor, 2020; McGregor et al., 2020). Such efforts are insufficient. In a synthesis of 41 systematic reviews of implementation science, when compared to passive dissemination strategies, active and multifaceted approaches were the most effective (Eccles & Mittman, 2006; Grimshaw et al., 2001; Lomas, 1993). On the basis of their synthesis, the authors concluded that educational outreach is the most consistently effective. Rogers (2003) further suggested that when attitudes are more strongly held, interpersonal channels are often more effective in dealing with an individual’s resistance or apathy. Given that, in the United States, stakeholders use many different terms to describe individuals with DLD, incorporating the use of DLD terminology by SLPs likely requires more interpersonal channels. Thus, it is important that researchers and clinicians come together to further the diffusion and implementation of DLD terminology. In this study, members of Raising Awareness of Developmental Language Disorder USA (RADLD-USA), which is an advocacy group for individuals with DLD comprising SLPs, researchers, and individuals with DLD and their families, developed a presentation to further educate SLPs about DLD and the use of DLD terminology.

This Study

The overarching goals of this study were to provide preliminary information on SLPs’ use and understanding of DLD terminology and to evaluate the potential value of using an educational video to increase DLD knowledge and use. Specifically, the first aim of this study was to evaluate SLPs’ current comfort levels in using DLD terminology and their current knowledge of DLD, and the second study aim was to increase SLPs’ comfort levels in using DLD terminology and their knowledge of DLD through an educational presentation developed and delivered by members of the RADLD-USA group. To address these aims, we conducted an online study that included a presurvey examining SLPs’ current comfort levels in using DLD terminology and their current knowledge of DLD. Participants then viewed a 45-min video that provided information about what DLD is, how DLD terminology can be used, and the benefits of using DLD terminology. After the video, participants completed a postsurvey nearly identical to the presurvey to evaluate change in comfort levels of DLD terminology use and in knowledge of DLD. The specific research questions were as follows.

1. What are SLPs’ current comfort levels in using DLD terminology?
2. Do SLPs’ comfort levels of use change after viewing a 45-min educational presentation?
3. What current knowledge do SLPs have about DLD?
4. Do SLPs’ knowledge of DLD change after viewing a 45-min educational presentation?

Given previous reports by caregivers of frequently not receiving a clear diagnosis for their child’s language weaknesses (Ash et al., 2020; Porter et al., 2020), we predicted that SLPs’ current comfort levels of use and current knowledge would be low. However, on the basis of research suggesting that active, multifaceted, and interpersonal approaches are effective dissemination strategies (Eccles & Mittman, 2006; Grimshaw et al., 2001; Lomas, 1993; Rogers, 2003), we predicted that comfort of use and knowledge would increase after viewing a 45-min educational presentation.
Method

This study was approved by an institutional review board at the University of Minnesota Twin Cities. This article was written using the Checklist for Reporting of Survey Studies (Sharma et al., 2021) and the Checklist for Reporting Results of Internet E-Surveys (Eysenbach, 2004).

Study Materials

Educational Presentation

The RADLD-USA team created a presentation to disseminate information and encourage SLPs across the country to utilize the term DLD in their routine clinical practice. The presentation comprised three modules: “What is DLD?,” “Diagnosing DLD,” and “The Value of a Diagnosis.” Each module was approximately 15 min in length. The presentation was developed by numerous ambassadors and founding members of RADLD-USA over the span of 6 months, from June 2021 to December 2021. Each module’s development was led by an ambassador, who was the main creator of the corresponding module slides and corresponding speaker notes. Each module contained 10–18 slides and ended with a slide including four to five true/false review questions. The true/false questions served as a review of the content presented in the previous module. The presentation slides are included in Supplemental Material S1, and the presentation is publicly available at https://www.youtube.com/watch?v= MndxVvsaTBk (Raising Awareness of Developmental Language Disorder, 2022).

Once the slides and scripts were reviewed by all involved RADLD-USA members, the lead ambassadors independently video-recorded their modules. The recordings included the slide presentation, with the presenter in a small window on the upper right corner. When presenting the true/false review questions, the presenter posed the question, paused, and then provided the correct answer for each question. The three module recordings were assembled to form a 45-min informational video for participants to view on Qualtrics in between completing the pre- and postsurveys.

Pre- and Postsurveys

The survey questions are included in the Appendix. The presurvey began with eight demographic questions involving race, gender, state of residency, work setting, ages served, years of experience, caseload totals, and estimated number of clients with DLD. This was followed by six Likert scale questions assessing SLPs’ comfort levels in using DLD terminology. Participants rated each question (e.g., “How comfortable are you describing DLD and using the term DLD with parents?”) on a 4-point scale, with 1 indicating not at all and 4 indicating very much. The survey continued with 12 true/false questions that assessed knowledge of DLD. The questions covered the content of the three-module presentation. The survey questions that covered the content of Modules 1 and 3 and two of the questions for Module 2 were nearly identical to those included in the true/false review questions in the presentation. Two of the survey questions for Module 2 (Questions 5 and 6) addressed content in the module but were different from the review questions in the presentation. Examples of questions include, “DLD is associated with a biomedical condition,” “DLD is identified by a mismatch between verbal and nonverbal intelligence,” and “DLD will always look the same in every domain of language.”

The postsurvey included the same six 4-point Likert scale questions and 12 true/false questions that were on the presurvey. The postsurvey ended with an open-ended question asking what else participants would like to know about DLD. After completing the postsurvey, participants had the option to provide their e-mail contact information in a separate survey and receive a $5 Amazon gift card. The first 200 participants who completed the study were eligible to receive a gift card.

Piloting

The usability and clarity of the survey questions were evaluated on International DLD Awareness Day (October 15, 2021). The investigators held a virtual meeting and shared the educational presentation with students and faculty from the speech-language pathology program at the University of Minnesota Twin Cities. Twelve individuals completed the pre- and postsurveys via Google Forms. On the basis of feedback, the surveys were modified to increase the clarity of the questions asked.

Survey Administration

This open-survey study was hosted online via Qualtrics. Data were collected from February 2, 2022, to April 12, 2022. To be eligible to participate in the study, participants needed to verify that they were a practicing SLP in the United States and that they worked with children. Respondents who were not currently practicing SLPs and not working with children in the United States were not eligible to complete the study. Participants confirmed their eligibility before completing the demographic questions and presurvey. As participants navigated through the 12 survey pages, Qualtrics notified respondents of any incomplete items. Prior items were not available for review upon submission to the next page.
Convenience samples were recruited through the American Speech-Language-Hearing Association Special Interest Group (SIG) discussion boards, social media (i.e., Instagram, SLP Facebook groups), newsletters, and e-mails to colleagues. Cluster samples were recruited through live sessions presented at statewide speech-language-hearing conventions (i.e., Minnesota Speech-Language-Hearing Association and Pennsylvania Speech-Language-Hearing Association 2022 state conventions). When live presentations were offered at statewide conventions, the presenters displayed a quick response (QR) code and offered time for participants to voluntarily complete the presurvey. Presenters then presented the scripted educational presentation before displaying another QR code to bring attendees back to the link to voluntarily complete the postsurvey.

**Ethical Considerations**

Participants were required to provide assent before voluntarily engaging in the study. Data remained de-identified unless the participant chose to share their e-mail to receive compensation. For protection, data were stored in Qualtrics and the University of Minnesota’s Box Secure Storage.

**Statistical Analyses**

To address Study Questions 1 and 2 regarding comfort levels of use, we analyzed responses to the six pre- and postsurvey Likert scale questions. For Question 1, we determined the percentages of participants with each response type (i.e., not at all, very little, somewhat, and very much) for each Likert scale question on the presurvey. For Question 2, we utilized RStudio (R Studio Team, 2022) to perform the McNemar (1947) chi-square test for paired samples (presurvey vs. postsurvey) using 3 × 3 matrices. Because the McNemar chi-square test requires all cell values to be greater than 0, we collapsed not at all and very little responses for analyses. Investigators completed a Bonferroni correction to adjust probability (p) values; p values less than .008 were considered statistically significant. To aid in the interpretation of these results, we also determined the percentages of participants whose comfort levels in using DLD terminology decreased, stayed the same, or increased from pre- to post-survey.

To address Study Questions 3 and 4 regarding DLD knowledge, we analyzed responses to the 12 pre- and post-survey true/false questions. For Question 3, we determined the percentages of participants with correct responses and those with incorrect responses for each true/false question on the presurvey. For Question 4, we performed the McNemar (1947) chi-square test in RStudio (R Studio Team, 2022) for paired samples (presurvey vs. postsurvey) using 2 × 2 matrices for each true/false question. Again, investigators completed a Bonferroni correction to adjust probability (p) values; p values less than .004 were considered statistically significant. We also used a paired t test to compare the total percent-correct responses for the true/false questions in the pre- and postsurveys and calculated Cohen’s d (Cohen, 1988) to serve as an effect size, with values of 0.2, 0.5, and 0.8 reflecting small, medium, and large effect sizes, respectively.

**Results**

**Respondents**

10 of the 2,905 individuals who visited the first page of the study, 2,775 proceeded to participate by answering the question on the first survey page (recruitment rate = 95.5%). Of these, 2,263 individuals continued through to the last questionnaire page, yielding a completion rate of 81.5%. Only a small fraction of responses were analyzed for this study due to a high rate of likely fraudulent responses. Within 24 hr of the Qualtrics link being posted online, more than 1,200 participants completed the surveys, suggesting an influx of “bad actors” possibly attempting to receive gift cards. After posting the initial study link, we used unique links to track how participants accessed the survey. In response to these likely fraudulent responses, investigators used a conservative approach and completed extensive data filtering.

**Data Filtering**

Using RStudio software (R Studio Team, 2022), investigators applied a filter, excluding all respondents who spent less than 22 min on the video and respondents who spent less than 25 min on the entire survey. These cutoffs were used to exclude those who could not have finished the 45-min presentation but allowed for video viewing at 2 times the speed. After this filter, 304 respondents remained. Of these, 280 used the original link to access the study, one accessed the study through a newsletter, 14 accessed the study through a link provided at a live convention presentation, and nine accessed the link through SIG discussion boards. The Sankey diagram in Figure 1 illustrates the step-by-step process used to further filter the remaining respondents and determine the unique, valid respondents. This process began with Condition 1, which excluded eight respondents who did not meet the inclusion criteria (i.e., were not a currently practicing SLP, did not work with children, or did not work in the United States). Condition 2 excluded 22 respondents who did not complete all the questions in each procedure. Condition 3 excluded 24 responses that...
contained repeated IP addresses and the same answer choices or overlapped in start and end times with other responses. Condition 4 excluded 110 respondents because they started and/or ended the online survey at the same time as at least one other respondent (if the survey was not collected at a live event). For Condition 5, investigators excluded 17 responses that contained caseload discrepancies/oddities. Examples of caseload discrepancies include respondents who reported that they had more clients with DLD than total clients on their caseload and respondents who answered “I don’t know” for caseload total but provided a number for clients with DLD. Caseload oddities included respondents who indicated that they had a caseload of less than five or more than 100. Condition 6 excluded all respondents who entered “True” for all true/false questions. For Condition 7, 17 respondents were excluded for inappropriate open-ended responses to the postsurvey’s optional open-ended question (e.g., “YES” or “NO,” answers that followed the pattern of “Yes, I...” or “Sure, I...”) and suspicious answers for years of experience (e.g., 5.7 or 6.4). Finally, for Condition 8, 11 respondents were eliminated due to a lack of click counts on pages, locations associated with previously excluded responses, and repeated attempts to receive a gift card. A total of 77 respondents remained for analyses after exclusions based on each of the conditions.

Sample Characteristics

Of these 77 participants, 60 used the original link to access the study, one accessed the study through a newsletter, nine accessed the study through a link provided at a live convention presentation, and seven accessed the link through SIG discussion boards. The demographic data gathered at the start of the presurvey are presented in Table 1 for these 77 participants, which we included in the final analyses. Participants selected as many responses as applicable. The majority of participants identified as White (77%) and women (71%). Most participants worked in a school setting (69%), but many worked in a clinic (62%), with some working in both settings. Responses were collected from 25 states. Most responses were from Minnesota (29%), California (10%), and Pennsylvania (8%).

Study Question Findings

Study Question 1: Current Comfort Levels in Using DLD Terminology

Figure 2 illustrates participant presurvey responses for each of the six Likert scale questions. An examination of Table 2 along with Figure 2 reveals that, for each question, the majority of responses were somewhat, indicating at least some comfort in using DLD terminology.
of percent-correct responses for the presurvey questions was 68% (SD = 19%; min–max: 17%–100%).

Study Question 4: Change in Knowledge

Results of the McNemar chi-square tests comparing pre- and postsurvey accuracy for each true/false question appear in Table 3. For two of the questions (Questions 4 and 8), the test results were associated with p values less than .004. The average value of percent-correct responses for the postsurvey questions was 78% (SD = 23%; min–max: 25%–100%). A paired t test comparing pre- and postsurvey accuracy was associated with a p value less than .004, t(76) = −5.7, p < .004, and an effect size of 0.47, indicating a medium effect. The spaghetti diagram in Figure 4 illustrates each participant’s pre- and postsurvey total percent-correct responses for the true/false question sections. An examination of Figure 4 reveals variability in respondents’ accuracy from pre- to postsurvey. The light blue lines at the top of the graph are thicker than the light blue lines toward the bottom, indicating that although many SLPs’ knowledge of DLD started relatively high, many improved in true/false accuracy following the educational video. This trend is consistent with the findings of the paired t-test analysis.

Short Answer Responses

Participants had the option to share what more they would like to learn about DLD at the end of the postsurvey. A total of 32 individuals answered this question. One participant said they would like to learn the most reliable assessment measures for diagnosing DLD. Four participants expressed interest in learning more about treatment approaches or other compensatory strategies from which individuals with DLD may benefit. One participant wanted to know how brain scans of children with DLD differ from those of children meeting typical language milestones. Another participant wanted to know more about the typical age at which a DLD diagnosis may be given. This participant and four others also expressed interest in learning more about the differential diagnosis of DLD versus language delay versus dyslexia. One participant wanted to further familiarize themselves with DLD terminology through concrete examples of case studies for children with DLD. Two participants wanted to know more about supporting caregivers and their child’s language at home. These participants also requested handouts and examples of symptoms to share with families and their social networks. Twelve participants simply expressed appreciation for the educational presentation, stating they learned so much and are excited to learn more. One participant expressed personal appreciation for this study, sharing that their own child and family would have benefited greatly from a DLD diagnosis. Five participants indicated that the educational presentation supplied them with knowledge they would currently like to know. One participant expressed

Study Question 2: Change in Comfort Levels Using DLD Terminology

Results of the McNemar chi-square tests appear in Table 2. All chi-square tests yielded p values less than .008. Figure 3 illustrates the percentages of participants whose comfort levels in using DLD terminology decreased, remained the same, and increased from pre- to postsurvey. An inspection of Figure 3 reveals that although many participants did not change their responses, the majority of responses indicated an increase in comfort levels using DLD terminology from pre- to postsurvey for each question.

Study Question 3: Baseline Knowledge

An examination of Table 3 reveals that for the 12 true/false knowledge questions, the percentage of participants who responded correctly to individual questions ranged from 22% to 84%. Across all questions, the average value
concerns related to how difficult it is to differentiate whether language difficulties are associated with another condition or co-occurring with DLD. This participant also expressed resistance to adopting DLD terminology due to concerns related to developmental versus acquired language disorders and that the term development might imply that a child is expected to grow out of DLD.

**Discussion**

In the United States, individuals with DLD remain underserved, and DLD itself is under-researched (McGregor, 2020). As McGregor (2020) highlights, DLD is a hidden impairment and a relatively unknown condition constrained by outdated policies, despite its high prevalence and significant impact. Thus, further efforts are needed to support the use of DLD terminology in the United States. In this study, we aimed to better understand SLPs’ current knowledge of DLD and their comfort levels in using DLD terminology as well as evaluate the use of an educational video to support further dissemination and implementation. We predicted that SLPs’ current comfort levels in using new DLD terminology and current knowledge of DLD terminology would be low (Ash et al., 2020; see also Porter et al., 2020) but would increase after viewing the educational presentation. Presurvey results indicated that the average participant reportedly felt somewhat comfortable discussing DLD with various stakeholders before the educational presentation and reported higher comfort levels following the educational presentation. There were significant differences in pre- and postsurvey responses for each of the six Likert scale questions. The two questions with the greatest shifts in levels were Questions 4 (i.e., “How comfortable are you with describing DLD and using the term DLD with teachers?”) and 6 (i.e., “How comfortable are you talking to teachers and administrators about the distinction between eligibility and identification?”). For Question 4, the presurvey indicated that 17% of respondents were very comfortable using DLD terminology with teachers. At postsurvey, the percentage of respondents who responded with very much shifted to 57%. These results suggest that the educational video supported SLPs’ perceived comfort levels in using DLD terminology, particularly with other professionals. Due to the preliminary nature of this study, further evaluation is needed to determine the extent to which increased comfort levels lead to implementation in true clinical and long-term maintenance.

Presurvey results indicated a range of accuracy across the true/false questions, suggesting inconsistencies in the types of knowledge SLPs had about DLD before viewing the educational presentation. For two of the presurvey true/false questions (i.e., Question 4: “DLD is identified by a mismatch between verbal and nonverbal intelligence” and Question 6: “When an SLP gives a child a
diagnosis of DLD, the child is automatically eligible to receive services in the school and/or through insurance. The presurvey percentage of correct responses was close to that of chance-level responses (51% and 49%, respectively). For one question (Question 8: “In addition to a typical evaluation, SLPs need to gather much more information to identify DLD”), presurvey accuracy (22%) was well below chance levels. Rogers (2003) suggests that as individuals are exposed to new knowledge about an innovation, they go through the innovation-decision process. During the first stage, the knowledge stage, participants gain awareness knowledge, how-to knowledge, and principles knowledge. The average accuracy on the true/false questions increased from pre- to postsurvey, suggesting that SLPs’ overall knowledge of DLD increased after viewing the educational presentation, which provided SLPs with awareness, how-to, and principles knowledge. The two questions that yielded the most significant increases in accuracy were Question 4, which shifted from 50% to 79%, and Question 8, which shifted from 22% to 57%. Results from Question 4

### Table 2. Responses to Likert scale pre- and postsurvey comfort level of use questions.

<table>
<thead>
<tr>
<th>Likert scale question</th>
<th>Presurvey %</th>
<th>Postsurvey %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N = 77)</td>
<td>(N = 77)</td>
</tr>
<tr>
<td>Q1. How familiar are you with DLD?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Very little</td>
<td>18.20</td>
<td>11.70</td>
</tr>
<tr>
<td>Somewhat</td>
<td>62.30</td>
<td>33.80</td>
</tr>
<tr>
<td>Very much</td>
<td>19.50</td>
<td>54.50</td>
</tr>
<tr>
<td>χ²(3) = 22.45, p &lt; .008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2. How comfortable are you with identifying an individual with DLD?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>2.60</td>
<td>1.30</td>
</tr>
<tr>
<td>Very little</td>
<td>26</td>
<td>6.50</td>
</tr>
<tr>
<td>Somewhat</td>
<td>41.60</td>
<td>28.60</td>
</tr>
<tr>
<td>Very much</td>
<td>29.90</td>
<td>63.60</td>
</tr>
<tr>
<td>χ²(3) = 25.37, p &lt; .008</td>
<td></td>
<td></td>
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<tr>
<td>Q3. How comfortable are you with describing DLD and using the term DLD with parents?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>10.40</td>
<td>1.30</td>
</tr>
<tr>
<td>Very little</td>
<td>20.80</td>
<td>11.70</td>
</tr>
<tr>
<td>Somewhat</td>
<td>49.40</td>
<td>37.70</td>
</tr>
<tr>
<td>Very much</td>
<td>19.50</td>
<td>49.40</td>
</tr>
<tr>
<td>χ²(3) = 23.36, p &lt; .008</td>
<td></td>
<td></td>
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<tr>
<td>Q4. How comfortable are you with describing DLD and using the term DLD with teachers?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>10.40</td>
<td>3.90</td>
</tr>
<tr>
<td>Very little</td>
<td>26</td>
<td>3.90</td>
</tr>
<tr>
<td>Somewhat</td>
<td>46.80</td>
<td>35.10</td>
</tr>
<tr>
<td>Very much</td>
<td>16.90</td>
<td>57.10</td>
</tr>
<tr>
<td>χ²(3) = 36.8, p &lt; .008</td>
<td></td>
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</tr>
<tr>
<td>Q5. How comfortable are you with talking to parents about the criteria for eligibility versus identifying DLD?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>7.80</td>
<td>0</td>
</tr>
<tr>
<td>Very little</td>
<td>26</td>
<td>9.10</td>
</tr>
<tr>
<td>Somewhat</td>
<td>36.40</td>
<td>36.40</td>
</tr>
<tr>
<td>Very much</td>
<td>29.90</td>
<td>54.40</td>
</tr>
<tr>
<td>χ²(3) = 21.01, p &lt; .008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q6. How comfortable are you talking to teachers and administrators about the distinction between eligibility and identification?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>6.50</td>
<td>0</td>
</tr>
<tr>
<td>Very little</td>
<td>17.40</td>
<td>6.50</td>
</tr>
<tr>
<td>Somewhat</td>
<td>46.80</td>
<td>44.20</td>
</tr>
<tr>
<td>Very much</td>
<td>19.50</td>
<td>49.40</td>
</tr>
<tr>
<td>χ²(3) = 30.5, p &lt; .008</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. DLD = developmental language disorder.
Figure 3. Changes in pre- to postsurvey responses for Likert scale questions regarding comfort levels in using developmental language disorder terminology (N = 77).

Table 3. Accuracy of true/false knowledge questions.

<table>
<thead>
<tr>
<th>True/false question</th>
<th>Presurvey % correct (N = 77)</th>
<th>Postsurvey % correct (N = 77)</th>
<th>$\chi^2$ (1)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. DLD is associated with a biomedical condition. (False)</td>
<td>62.3</td>
<td>72.7</td>
<td>2.04</td>
<td>.153</td>
</tr>
<tr>
<td>2. Children will grow out of DLD. (False)</td>
<td>72.7</td>
<td>76.6</td>
<td>0.21</td>
<td>.646</td>
</tr>
<tr>
<td>3. DLD can co-occur with other neurodevelopmental disorders such as ADHD. (True)</td>
<td>81.8</td>
<td>88.3</td>
<td>1.45</td>
<td>.228</td>
</tr>
<tr>
<td>4. DLD is identified by a mismatch between verbal and nonverbal intelligence. (False)</td>
<td>50.6</td>
<td>79.2</td>
<td>14.7</td>
<td>&lt;.004</td>
</tr>
<tr>
<td>5. It is within an SLP’s scope of practice to identify individuals with DLD. (True)</td>
<td>75.3</td>
<td>81.8</td>
<td>1.23</td>
<td>.267</td>
</tr>
<tr>
<td>6. When an SLP gives a child a diagnosis of DLD, the child is automatically eligible to receive services in the school and/or through insurance. (False)</td>
<td>49.4</td>
<td>51.9</td>
<td>0.08</td>
<td>.773</td>
</tr>
<tr>
<td>7. DLD will always look the same in every domain of language. (False)</td>
<td>79.2</td>
<td>83.1</td>
<td>0.31</td>
<td>.579</td>
</tr>
<tr>
<td>8. In addition to a typical evaluation, SLPs need to gather much more information to identify DLD. (False)</td>
<td>22.1</td>
<td>57.1</td>
<td>18.27</td>
<td>&lt;.004</td>
</tr>
<tr>
<td>9. Diagnosing DLD benefits SLPs. (True)</td>
<td>77.9</td>
<td>88.3</td>
<td>3.5</td>
<td>.061</td>
</tr>
<tr>
<td>10. Caregivers often report feeling confident in talking about their child’s language difficulties. (False)</td>
<td>76.6</td>
<td>80.5</td>
<td>0.27</td>
<td>.606</td>
</tr>
<tr>
<td>11. Sharing the term DLD can connect children and families with a community of people with shared identities. (True)</td>
<td>84.4</td>
<td>90.9</td>
<td>1.45</td>
<td>.228</td>
</tr>
<tr>
<td>12. Talking to children about neurodevelopmental differences reduces a child’s negative feelings toward themselves. (True)</td>
<td>81.8</td>
<td>88.3</td>
<td>2.29</td>
<td>.131</td>
</tr>
</tbody>
</table>

Note. DLD = developmental language disorder; ADHD = attention-deficit/hyperactivity disorder; SLP(s) = speech-language pathologist(s).
indicate a greater understanding of the current defining factors of DLD, such that there does not need to be a discrepancy between verbal and nonverbal intelligence. Results of Question 8 indicate that more SLPs believed that identifying DLD does not require significantly more information than is typically obtained; however, the overall correct percentage was still somewhat low. Thus, SLPs may need more information about how to efficiently identify DLD in their clinical practice.

Overall, it may be that after viewing the educational presentation, participants were closer to the persuasion stage of the innovation-decision process (Rogers, 2003), where they will continue to process new information and begin to form opinions about DLD terminology before entering the decision stage. However, it is likely that SLPs will need additional support to increase their use and knowledge of DLD terminology. In this study, we examined the use of one approach, namely, an educational presentation, for increasing SLPs’ knowledge of DLD. It will be important for future investigations to examine alternative approaches to determine how to support SLPs most efficiently and effectively in their clinical practice.

**Study Limitations**

Although this study’s materials adhere to existing theories and knowledge, the content of the educational presentation and of the surveys has not been validated. The surveys and educational presentation used in this study have never been used before, so reliability has not been established. This study’s repeated-measures design lacked random sampling, and therefore, the results of this study can be applied to participants within the sample but cannot be generalized to all SLPs. This study’s sample size is relatively small. The sample identified primarily as White women but represented 25 states. Further limitations of the repeated-measures design include knowledge or attitude decay (Stratton, 2019); we do not know for how long increased knowledge of and comfort levels in using DLD terminology will last.

Another limitation to this study was the lack of measures in place to prevent multiple participation of respondents (Sharma et al., 2021). Being that this was a nationally distributed online survey, we do not exactly know who completed the study. In addition, in response to the high rate of likely fraudulent responses, the investigators’ own biases contributed to the limitations of this study. The filtering process used to eliminate potential “bad actors” could have been too conservative, excluding valid responses, or too liberal, including invalid responses. Finally, this study examined knowledge of and perceived comfort levels in using DLD terminology and does not conclude whether individuals have indeed adopted the term DLD.

**Future Directions**

Participants provided useful ideas for the next directions in the last question of the postsurvey. The open-ended responses highlighted that SLPs are interested in diversifying their knowledge to gain more awareness, how-to, and principles knowledge about DLD (Rogers, 2003). Respondents expressed interest in gaining more knowledge related to the assessment of DLD, intervention for DLD, using DLD terminology with various stakeholders, differential diagnosis of DLD and similar profiles, and resources for families. Real-world settings are complex systems, influenced by policy, organizations, and stakeholders of DLD terminology (Grimshaw et al., 2001). Further diffusion efforts are needed to increase the adoption of DLD terminology use. Future efforts should be made to understand the needs of target adopters, the current attitudes and values of target adopters, what factors will increase the likelihood of adoption, and how potential adopters can be influenced to change their behaviors. Additionally, future research should examine change in DLD terminology use by clinicians across a variety of settings with increased knowledge.

**Conclusions**

This study aimed to provide a preliminary understanding of SLPs’ current comfort levels in using DLD...
terminology and their knowledge of DLD. Additionally, through an educational video, we aimed to help SLPs better understand how and why they should adopt new DLD terminology in their clinical practice. Results of pre- and postsurvey Likert scale questions indicated that participants’ comfort levels in using DLD terminology increased with statistical significance after viewing the educational presentation. Similarly, results of pre- and postsurvey true/false questions indicated that participants’ knowledge of DLD increased with a medium effect after viewing the educational presentation. Thus, our results indicate that diffusion efforts, such as educational presentations, may increase SLPs’ comfort levels in using DLD terminology as well as SLPs’ knowledge of DLD and motivate further evaluation of dissemination approaches for increasing the use and understanding of DLD terminology.

Data Availability Statement

The data sets generated during analyses in this study are available in anonymized form from the corresponding author on reasonable request.

Author Contributions

Erin Steffes: Conceptualization (Supporting), Formal analysis (Lead), Funding acquisition (Lead), Methodology (Lead), Writing – original draft (Lead), Writing – review & editing (Supporting). Lizbeth H. Finestack: Conceptualization (Lead), Formal analysis (Supporting), Funding acquisition (Supporting), Methodology (Lead), Writing – original draft (Supporting), Writing – review & editing (Lead).

Acknowledgments

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References


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## Survey Questions

### Presurvey Inclusion Questions
- Are you currently practicing as an SLP?
  - Yes
  - No
- Do you currently work with children with language impairments?
  - Yes
  - No
- Do you practice in the United States?
  - Yes
  - No

### Presurvey Demographic Questions
- In which setting(s) do you work? Select all that apply.
  - School
  - Clinic
  - Other (please specify below)

- Which age group(s) do you primarily serve in your job? Select all that apply.
  - Birth–5 years
  - 6–10 years
  - 11–13 years
  - 14–18 years
  - 19–30 years
  - > 30 years

- How many years of experience do you have as an SLP? Please enter a number 0 or greater only.

- How many children (ages 0–18) do you have on your current caseload? Please enter a number only or write “Don’t know” if you don’t know.

- Of the children on your caseload, how many would you characterize as having DLD? Please enter a number only or write “Don’t know” if you don’t know.

- What is your state of residency?

- What is your race?

- What is your gender?

### *Likert Scale Questions*
- How familiar are you with DLD?
  - Not at all
  - Very little
  - Somewhat
  - Very much

- How comfortable are you with identifying an individual with DLD?
  - Not at all
  - Very little
  - Somewhat
  - Very much

- How comfortable are you with describing DLD and using the term DLD with parents?
  - Not at all
  - Very little
  - Somewhat
  - Very much

- How comfortable are you with describing DLD and using the term DLD with teachers?
  - Not at all
  - Very little
  - Somewhat
  - Very much

- How comfortable are you with talking to parents about the criteria for eligibility versus identifying DLD?
  - Not at all
  - Very little
  - Somewhat
  - Very much

- How comfortable are you talking to teachers and administrators about the distinction between eligibility and identification?
  - Not at all
  - Very little
  - Somewhat
  - Very much

(continued)
**Appendix (p. 2 of 2)**

Survey Questions

<table>
<thead>
<tr>
<th><em>True/False Questions</em></th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLD is associated with a biomedical condition.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children will grow out of DLD.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DLD can co-occur with other neurodevelopmental disorders such as ADHD.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DLD is identified by a mismatch between verbal and nonverbal intelligence.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is within an SLP's scope of practice to identify individuals with DLD.</td>
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<td></td>
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<td>When an SLP gives a child a diagnosis of DLD, the child is automatically eligible to receive services in the school and/or through insurance.</td>
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<td>DLD will always look the same in every domain of language.</td>
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<td>In addition to a typical evaluation, SLPs need to gather much more information to identify DLD.</td>
<td></td>
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<td>Diagnosing DLD benefits SLPs.</td>
<td></td>
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<td>Caregivers often report feeling confident in talking about their child’s language difficulties.</td>
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<td>Sharing the term DLD can connect children and families with a community of people with shared identities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talking to children about neurodevelopmental differences reduces a child’s negative feelings toward themselves.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Postsurvey Open-Ended Question**

What more would you like to learn about DLD, if anything?

*Both pre- and postsurveys included the same Likert scale and true/false questions.*